

TRANSPORTATION IMPACT ANALYSIS

Middlesound West

Wilmington, NC

*Prepared for
Tribute Investment & Development, Inc.*





Transportation Impact Analysis

Middlesound West
Wilmington, NC

Prepared for Tribute Investment &
Development, Inc.
June 24, 2019

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**Middlesound West – Transportation Impact Analysis
Wilmington, NC
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1.0 Introduction

The Middlesound West development is to be located on the north quadrant of the intersection of Middle Sound Loop Road and Lendire Road in Wilmington, North Carolina. As currently planned, this site development proposes 49 dwelling units of multifamily housing (low-rise), 240 dwelling units of multifamily housing (mid-rise), and 32 employee small office building. Two (2) accesses are proposed to the site, one full access on Lendire Road and one full access on Lendire Access Road. Figure 1 shows the site plan. The site location and vicinity map are illustrated in Figure 2A and Figure 2B respectively.

DAVENPORT was retained to determine the potential traffic impacts of this development and to identify transportation improvements that may be required to accommodate the impacts of both background traffic and new development traffic. The following intersections were included in the study:

- US 17 (Market Street) at SR 1403 (Middle Sound Loop Road)
- US 17 (Market Street) at Lendire Access Road (not state maintained)
- SR 1403 (Middle Sound Loop Road) / SR 2892 (Lendire Road) at Lendire Access Road (not state maintained)
- SR 2892 (Lendire Road) at Site Access 1
- Lendire Access Road (not state maintained) at Site Access 2

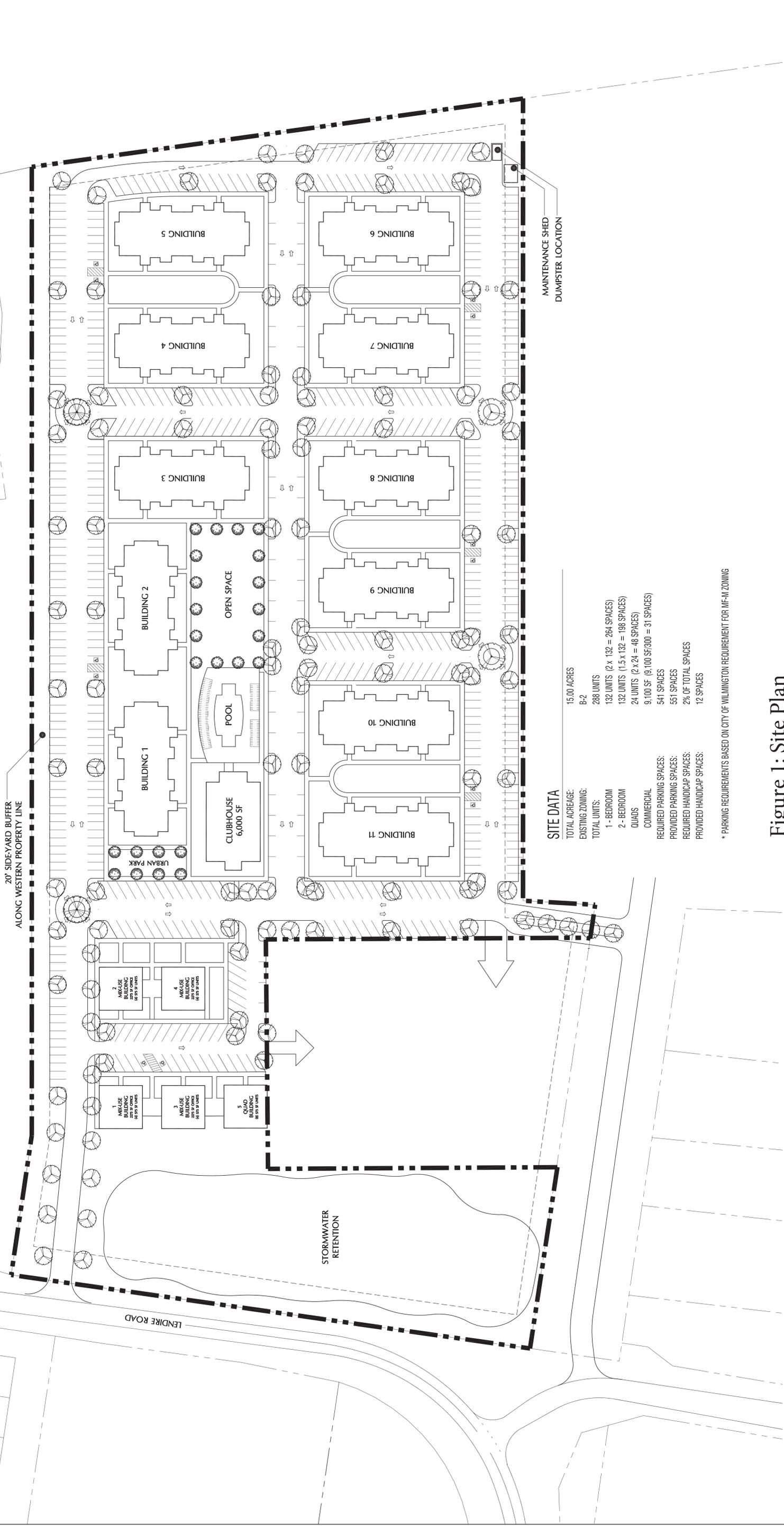
The intersections were analyzed during the AM (7-9 am) and PM (4-6 pm) peaks for the following conditions:

- 2019 Existing Conditions
- 2021 Future No Build Conditions
- 2021 Future Build Conditions
- 2021 Future Build Conditions with Improvements

The Wilmington Metropolitan Organization (WMPO) and NCDOT were contacted to obtain background information and to ascertain the elements to be covered in this Transportation Impact Analysis (TIA). The approved scope for this TIA is included in the appendix. Information regarding the property was provided by Tribute Investment & Development, Inc.



SCALE: 1" = 50'



SITE DATA

- TOTAL ACREAGE: 15.00 ACRES
- EXISTING ZONING: B-2
- TOTAL UNITS: 288 UNITS
- 1 - BEDROOM: 132 UNITS (2 x 132 = 264 SPACES)
- 2 - BEDROOM: 132 UNITS (1.5 x 132 = 198 SPACES)
- QUADS: 24 UNITS (2 x 24 = 48 SPACES)
- COMMERCIAL: 9,100 SF (9,100 SF/300 = 31 SPACES)
- REQUIRED PARKING SPACES: 541 SPACES
- PROVIDED PARKING SPACES: 551 SPACES
- REQUIRED HANDICAP SPACES: 2% OF TOTAL SPACES
- PROVIDED HANDICAP SPACES: 12 SPACES

* PARKING REQUIREMENTS BASED ON CITY OF WILMINGTON REQUIREMENT FOR MF-M ZONING

Figure 1: Site Plan
PRELIMINARY LAYOUT
MIDDLESOUND WEST
Wilmington, NC

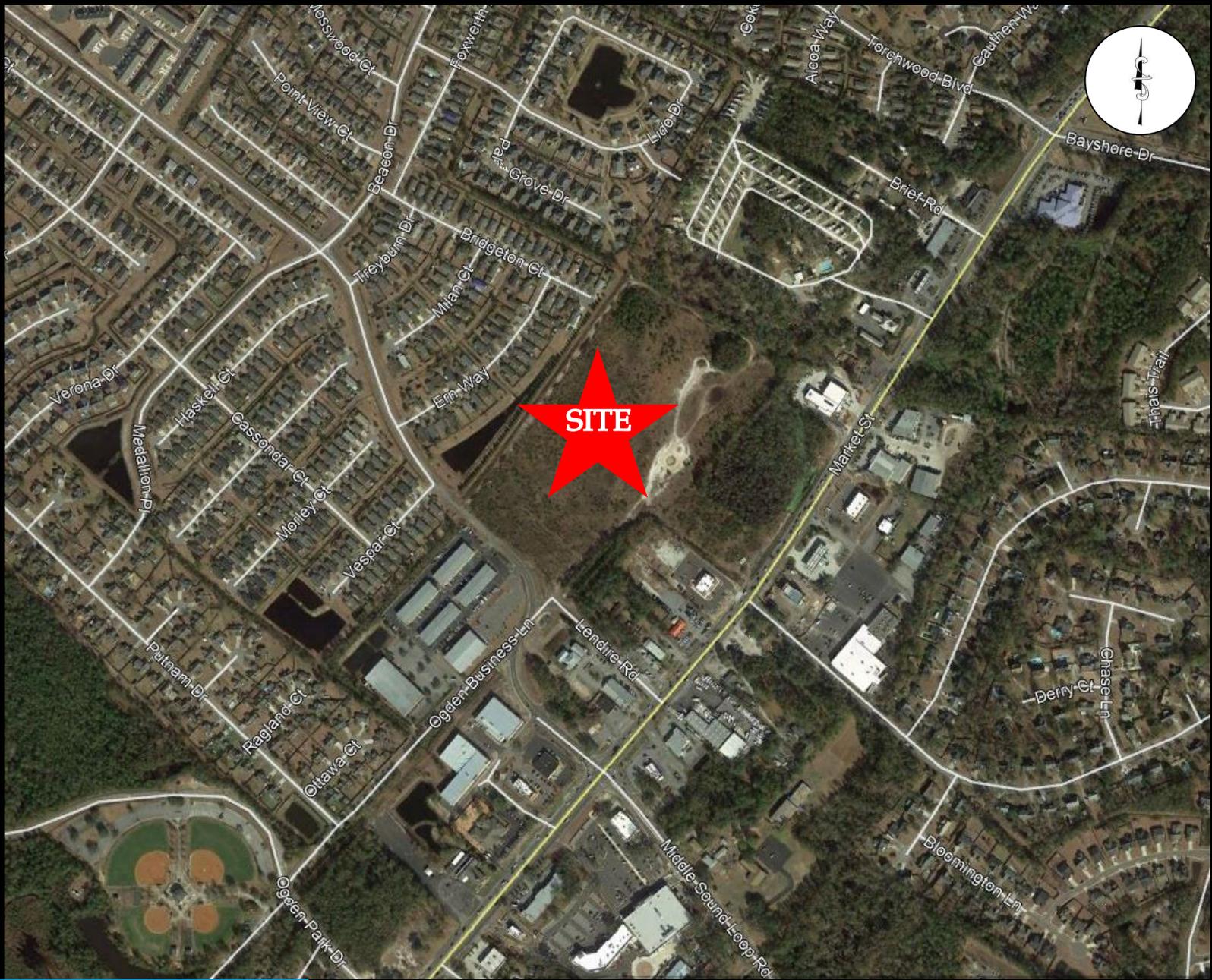


FIGURE 2A
SITE LOCATION MAP

SITE INDICATOR 

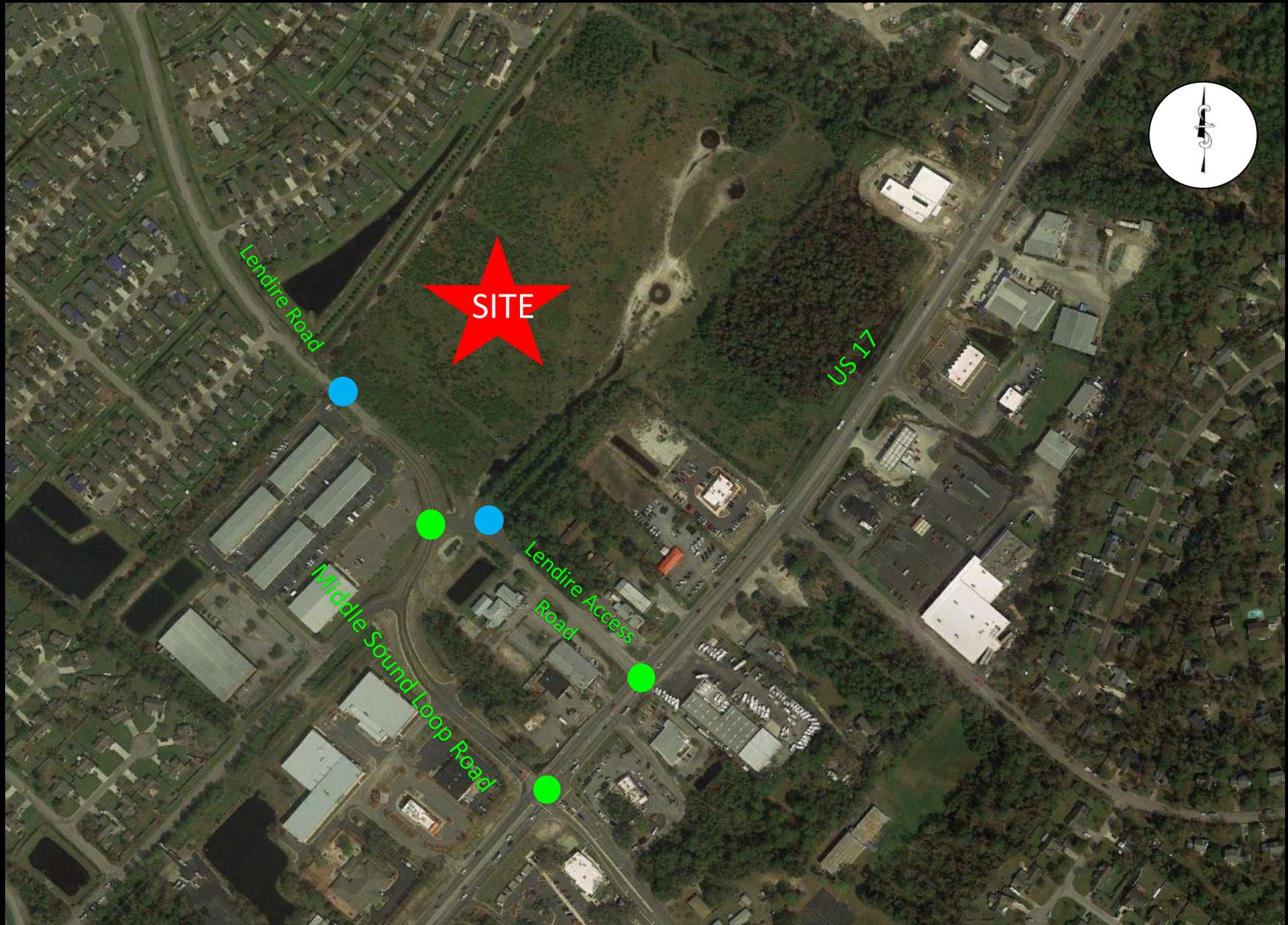


FIGURE 2B
VICINITY MAP

STUDY INTERSECTIONS
BACKGROUND
PROPOSED



2.0 Existing Conditions

2.1 Inventory

A field investigation was conducted by DAVENPORT staff to determine the existing roadway conditions in the study area. Table 2.1 contains the results of this effort. Figure 3 illustrates the existing lane geometry.

Table 2.1 - Street Inventory					
Facility Name	Route #	Typical Cross Section	Pavement Width	Speed Limit	Maintained By
Market Street	US 17	4-Lane Undivided with TWLTL	Approx. 60'	45 MPH	NCDOT
Middle Sound Loop Road	SR 1403	2-Lane Undivided	Approx. 24'	35 MPH	NCDOT
Lendire Road	SR 2892	2-Lane Undivided	Approx. 20'	35 MPH	NCDOT
Lendire Access Road	N/A	2-Lane Undivided	Approx. 20'	Not Posted	City of Wilmington

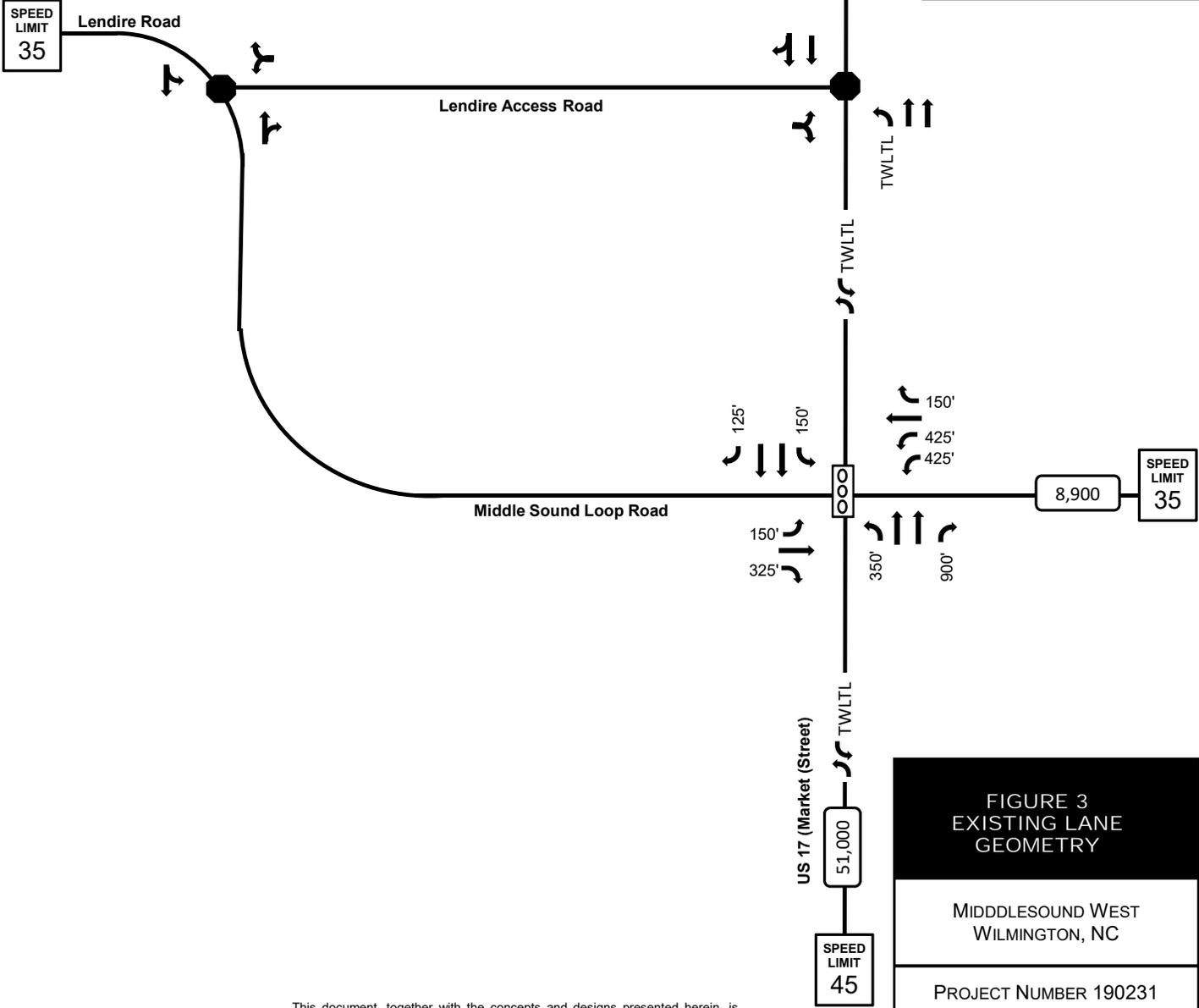
2.2 Existing Traffic Volumes

Existing traffic volumes for this project were collected by DAVENPORT staff. Table 2.2 contains the dates these counts were conducted. Schools were in session at the time of traffic counts. A system peak hour was used for the traffic analysis. The AM peak hour occurred from 7:15 to 8:15 AM and the PM peak hour occurred from 5:00 to 6:00 PM. Figure 4 shows the 2019 existing AM and PM peak hour volumes. More information can be found in the Traffic Volume Data section of the appendix.

Table 2.2 - Traffic Volume Data		
<u>Count Location:</u>	<u>Date Taken:</u>	<u>By:</u>
US 17 at Middle Sound Loop Road	04/24/2019	DAVENPORT
US 17 at Lendire Access Road	04/24/2019	DAVENPORT
Lendire Road at Lendire Access Road	04/25/2019	DAVENPORT



LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	ROADWAY
	TRAFFIC MOVEMENT
BLACK = EXISTING	
	AADT 2017 VOLUME
	TWO WAY LEFT TURN LANE



**FIGURE 3
EXISTING LANE
GEOMETRY**

MIDDLESOUND WEST
WILMINGTON, NC

PROJECT NUMBER 190231

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LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	ROADWAY
	TRAFFIC MOVEMENT
BLACK = EXISTING	
AM / PM PEAKS	

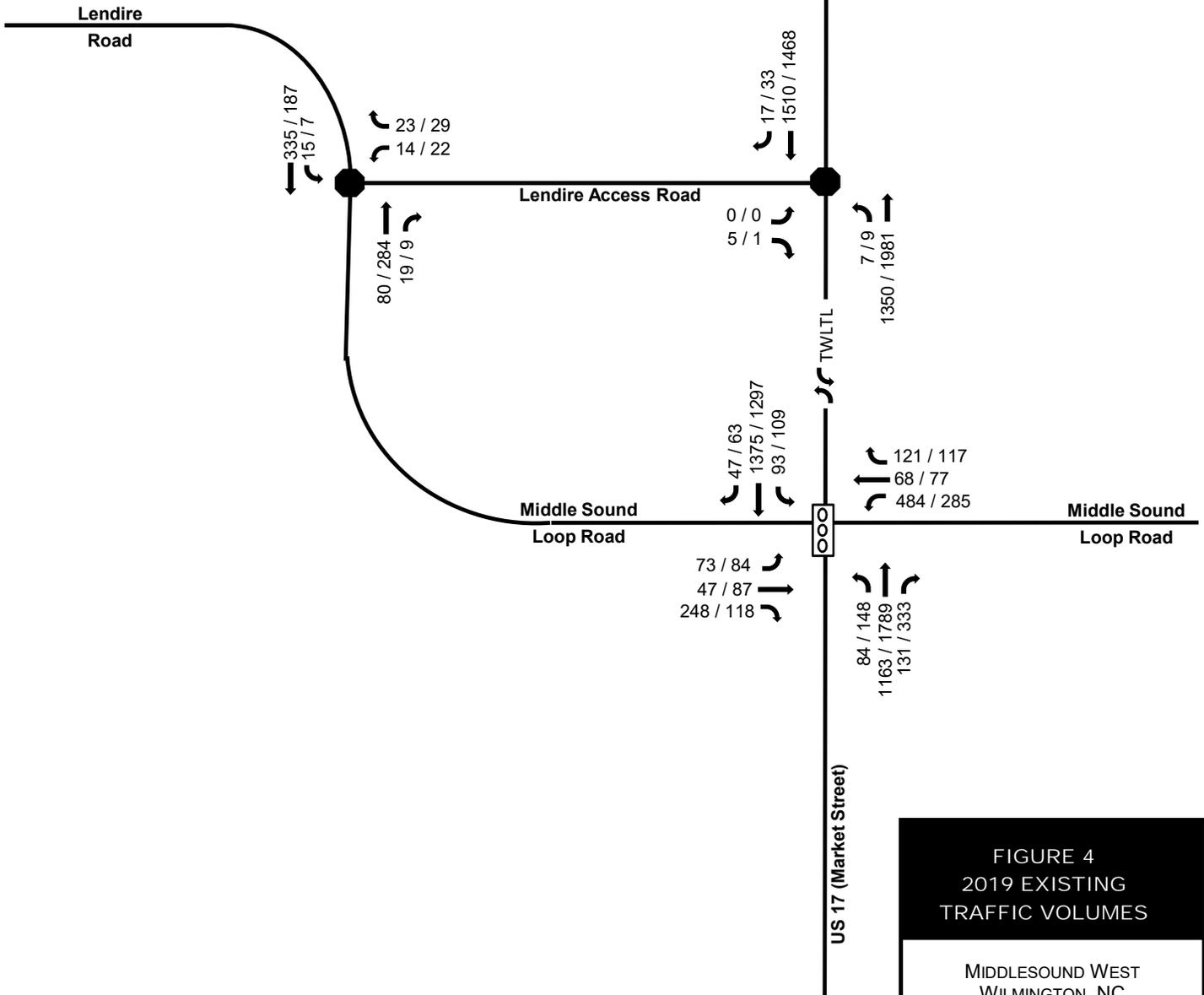


FIGURE 4
2019 EXISTING
TRAFFIC VOLUMES

MIDDLESOUND WEST
 WILMINGTON, NC

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3.0 Approved Developments and Committed Improvements

3.1 *Approved Developments*

Approved developments are developments that have been recently approved in the area, but not yet constructed. Per WMPO staff, there is one (1) approved development to be considered in this analysis.

The Ogden Starbucks development is to be located on the northwest corner of Market Street and Middle Sound Loop Road. The development consists of a 2,200 square foot coffee shop with drive-through window. It was assumed that this site would be fully build and operational by the 2021 analysis year. Therefore, trips for this approved development were included in the no build and build analyses. These trips were based on trip generation and trip distribution from the Ogden Starbucks development's TIA. More information can be found in the supporting documents section of the appendix.

3.2 *Committed Improvements*

Committed Improvements are improvements that are planned by NCDOT, the City, or a developer in the area, but not yet constructed. Per WMPO staff, there are two (2) committed improvements to be considered in this analysis.

The proposed development is within the study area for the NCDOT STIP Project U-4902D (Design Year 2038) and U-4751 (Design Year 2037). These projects recommend improvements in the study area of the proposed development. The recommended improvements are as follows: an additional eastbound right turn lane and extend southbound right turn lane to 175 feet of storage on Middle Sound Loop Road at US 17 with signal modifications, and a right-in right-out intersection configuration at US 17 and Lendire Access Road. These improvements were assumed to be in place along with the approved development in 2021 future no build conditions.

It was requested to determine whether the development has been rezoned from what was included in the TIP forecast. If the development has been rezoned, then the TIA must include the TIP design year (2038) analysis for the difference of the zoned use. It was determined and confirmed with WMPO/NCDOT that the TIP design year (2038) will not be required. More information can be found in the supporting documents section of the appendix.

4.0 Methodology

4.1 Base Assumptions and Standards

In general, the analysis for this project was conducted utilizing commonly accepted NCDOT standards. The following table contains a summary of the base assumptions:

Table 4.1 - Assumptions	
Peak Hour Factor	0.90
Background Traffic Annual Growth Rate	1.0% per year for all roadways
Analysis Software	Synchro/SimTraffic Version 10.0
Base Signal Timing/Phasing	City of Wilmington
Lane widths	12-feet
Truck percentages	2%

4.2 Trip Generation

The Middlesound West development is planned to consist of 49 dwelling units of multifamily housing (low-rise), 240 dwelling units of multifamily housing (mid-rise), 32 employee small office building. The trip generation potential of this site was projected based on the 10th Edition of the ITE Trip Generation Manual. Table 4.2 presents the results.

Table 4.2 - ITE Trip Generation									
Middlesound West									
Average Weekday Driveway Volumes					24 Hour	AM Peak Hour		PM Peak Hour	
					Two-Way	Enter	Exit	Enter	Exit
Land Use	ITE Land Code	Size	Method/Type	Volume	Enter	Exit	Enter	Exit	
Multifamily Housing (Low-Rise)	220	24.0	Dwelling Units	Adjacent/Equation	141	3	9	10	6
Multifamily Housing (Mid-Rise)	221	264.0	Dwelling Units	Adjacent/Equation	1,437	23	66	69	44
Small Office Building	712	32.0	Employees	Generator/Equation	255	25	14	29	32
Total Unadjusted Trips					1,833	51	89	108	82

4.3 Trip Distribution

Site trips for this proposed development were distributed based on the existing traffic patterns and engineering judgment. These distributions were reviewed and approved by WMPO. The directional distributions for site trips are as follows:

- 45% to and from the north on US 17
- 40% to and from the south on US 17
- 10% to and from the east on Middle Sound Loop Road
- 5% to and from the west on Lendire Road

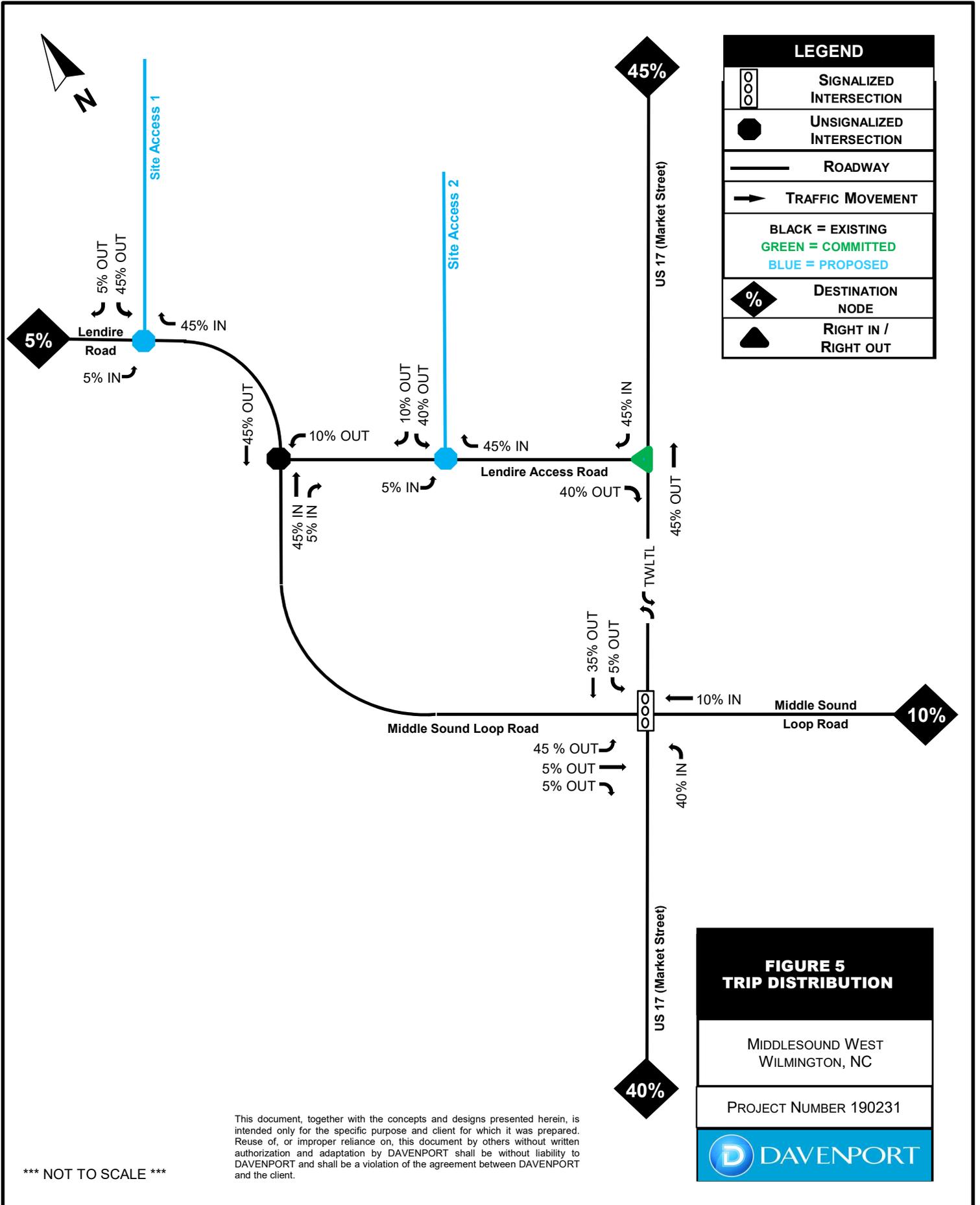
The site trips distribution are shown in Figure 5.

4.4 2021 Future No Build Traffic

The 2021 future no build traffic volumes were computed by applying a 1.0% compounded annual growth rate to the 2019 existing traffic volumes and adding approved development trips. Figure 6 shows 2021 future no build traffic volumes for AM and PM peaks.

4.5 2021 Future Build Total Traffic

The 2021 build-out traffic volumes were obtained by summing the 2021 future no build volumes and site trips due to the proposed development. Site trips are shown in Figure 7. The 2021 future build volumes are shown for AM and PM peaks in Figure 8.



LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	ROADWAY
	TRAFFIC MOVEMENT
BLACK = EXISTING GREEN = COMMITTED BLUE = PROPOSED	
	DESTINATION NODE
	RIGHT IN / RIGHT OUT

**FIGURE 5
TRIP DISTRIBUTION**

MIDDLESOUND WEST
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LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	ROADWAY
	TRAFFIC MOVEMENT
	BLACK = EXISTING GREEN = COMMITTED
	AM / PM PEAKS
	RIGHT IN / RIGHT OUT

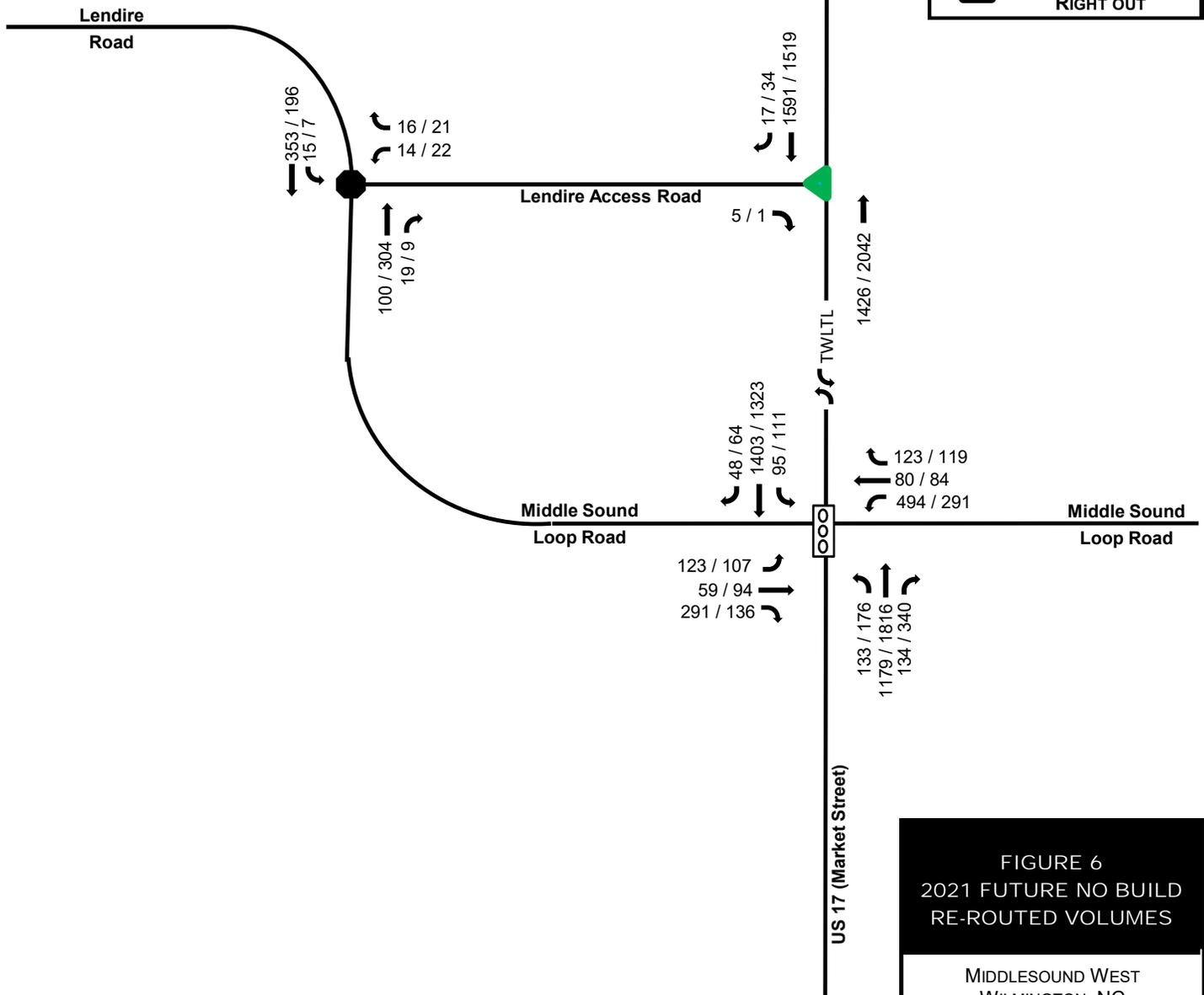


FIGURE 6
2021 FUTURE NO BUILD
RE-ROUTED VOLUMES

MIDDLESOUND WEST
WILMINGTON, NC

PROJECT NUMBER 190231

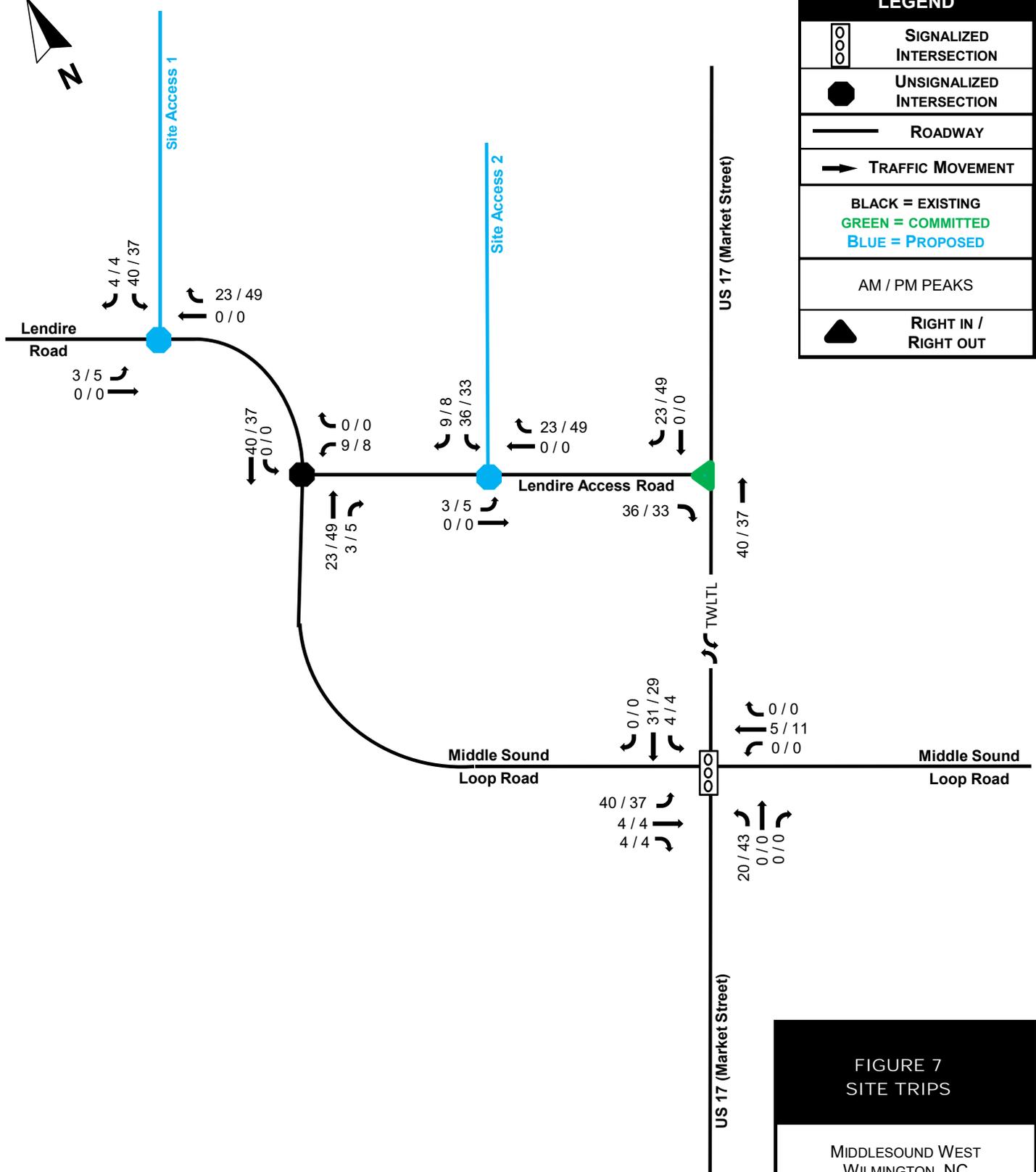


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LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	ROADWAY
	TRAFFIC MOVEMENT
BLACK = EXISTING GREEN = COMMITTED BLUE = PROPOSED	
AM / PM PEAKS	
	RIGHT IN / RIGHT OUT



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FIGURE 7
SITE TRIPS

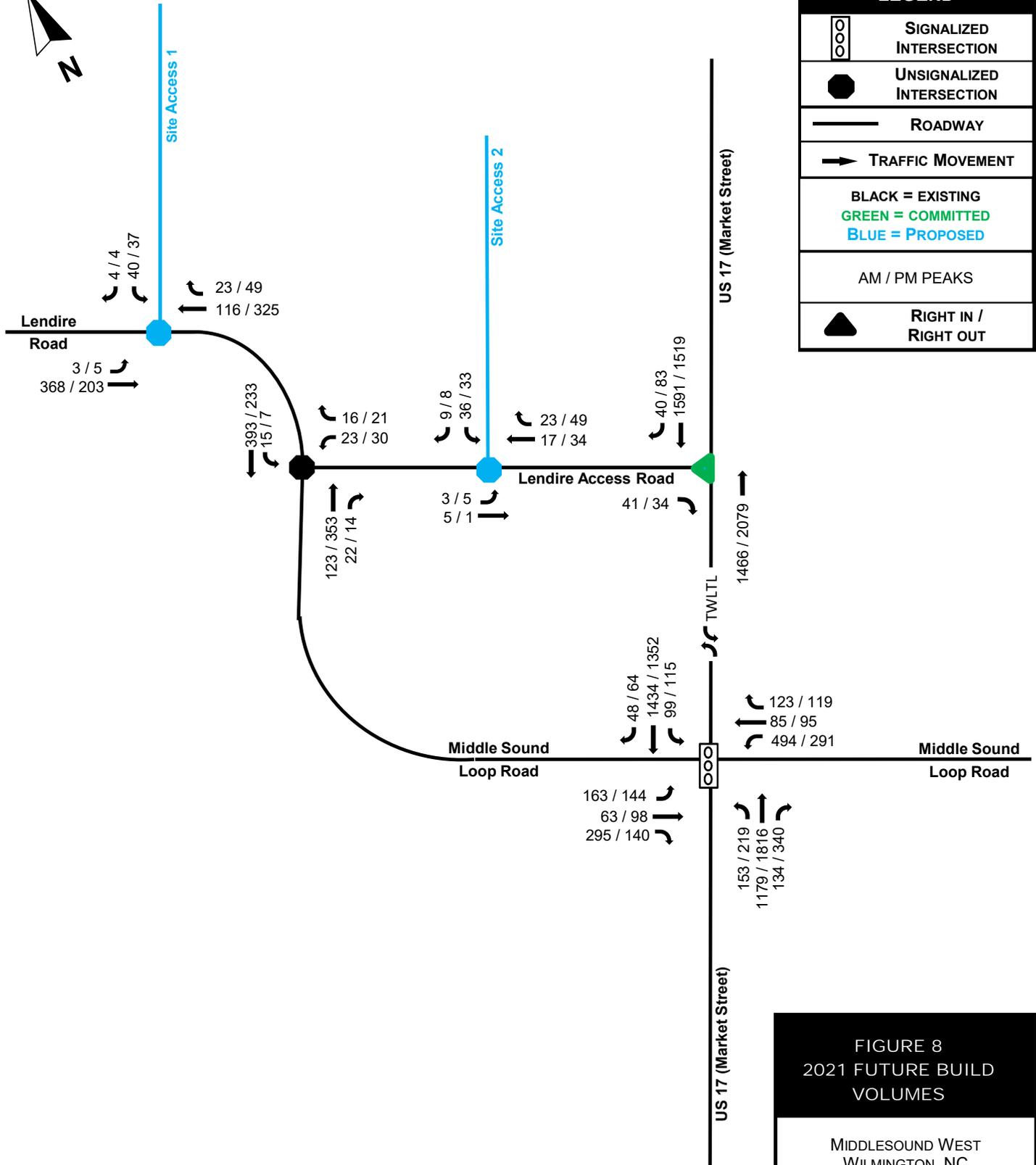
MIDDLESOUND WEST
WILMINGTON, NC

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LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	ROADWAY
	TRAFFIC MOVEMENT
	BLACK = EXISTING
	GREEN = COMMITTED
	BLUE = PROPOSED
AM / PM PEAKS	
	RIGHT IN / RIGHT OUT



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FIGURE 8
2021 FUTURE BUILD
VOLUMES

MIDDLESOUND WEST
WILMINGTON, NC

PROJECT NUMBER 190231



5.0 Capacity Analysis

5.1 Level of Service Evaluation Criteria

The Transportation Research Board’s Highway Capacity Manual (HCM) utilizes a term “level of service” to measure how traffic operates in intersections and on roadway segments. There are currently six levels of service ranging from A to F. Level of service “A” represents low-volume traffic operations and Level of Service “F” represents high-volume, oversaturated traffic operations. Synchro Traffic Modeling software was used to determine the level of service for studied intersections. Note for unsignalized intersection analysis, the level of service noted is for the worst approach of the intersection. This is typically the left turn movement for the side street approach, due to the number of opposing movements. All worksheet reports from the analyses can be found in the Appendix.

Table 5.1 – Highway Capacity Manual

Levels of Service and Control Delay Criteria			
Signalized Intersection		Unsignalized Intersection	
Level of Service	Control Delay Per vehicle (sec)	Level of Service	Delay Range (sec)
A	≤ 10	A	≤ 10
B	> 10 and ≤ 20	B	> 10 and ≤ 15
C	> 20 and ≤ 35	C	> 15 and ≤ 25
D	> 35 and ≤ 55	D	> 25 and ≤ 35
E	> 55 and ≤ 80	E	> 35 and ≤ 50
F	> 80	F	> 50

5.2 Level of Service Results

The following section discusses the level of service for each intersection.

US 17 at Middle Sound Loop Road

This signalized intersection currently operates at LOS D during the AM and PM peaks. In 2021 future no build condition with future committed improvements, this intersection is expected to operate at LOS E during the AM and PM peaks. In the 2021 future build conditions, the level of service is expected to remain unchanged. It should be noted that the total average delay at the intersection or individual approaches do not increase by 25% or greater. Additionally, with the addition of the committed improvements to add dual right turn lanes on the eastbound approach and extending the southbound right turn lane to 175 feet of storage, this intersection will be built out and improved to the maximum extent; therefore, there is no additional right of way available to provide additional intersection approach lane improvements. Therefore, no improvements are recommended to accommodate the future build traffic.

Table 5.2 - US 17 at Middle Sound Loop Road													
Scenario	Overall LOS	Level of Service by Approach (Delay in sec/veh)											
		Eastbound			Westbound			Northbound			Southbound		
AM Peak Hour													
2019 Existing	D (44.9)	L	T	R	L	T	R	L	T	R	L	T	R
		F (96.8)	F (84.0)	F (170.4)	E (78.0)	E (58.2)	D (47.6)	D (43.9)	C (25.2)	A (3.3)	C (24.0)	C (28.9)	A (6.4)
		F (144.8)			E (70.6)			C (24.2)			C (27.9)		
2021 Future No Build	E (59.0)	L	T	R	L	T	R	L	T	R	L	T	R
		F (85.2)	F (83.3)	E (64.2)	D (51.6)	D (52.7)	D (37.5)	F (111.3)	D (46.2)	A (4.4)	F (83.8)	E (69.8)	C (25.8)
		E (72.1)			D (49.2)			D (48.3)			E (69.3)		
2021 Future Build	E (66.6)	L	T	R	L	T	R	L	T	R	L	T	R
		F (83.5)	F (83.4)	E (59.5)	D (52.7)	E (56.3)	D (39.7)	F (119.4)	D (48.8)	A (4.7)	F (82.6)	F (88.2)	C (26.9)
		E (69.9)			D (50.8)			D (52.1)			F (86.0)		
PM Peak Hour													
2019 Existing	D (48.8)	L	T	R	L	T	R	L	T	R	L	T	R
		F (192.1)	F (188.8)	F (141.8)	F (163.7)	F (136.6)	F (122.3)	D (43.4)	C (29.6)	A (3.7)	F (99.3)	C (21.1)	A (4.1)
		F (170.6)			F (149.2)			C (26.7)			C (26.2)		
2021 Future No Build	E (73.5)	L	T	R	L	T	R	L	T	R	L	T	R
		F (171.5)	F (170.1)	F (109.3)	F (123.5)	F (121.3)	F (95.1)	F (250.4)	E (62.8)	A (6.3)	F (168.8)	D (41.7)	C (24.4)
		F (146.0)			F (116.3)			E (68.8)			D (50.4)		
2021 Future Build	E (78.6)	L	T	R	L	T	R	L	T	R	L	T	R
		F (166.6)	F (170.0)	F (103.3)	F (123.0)	F (129.9)	F (99.8)	F (247.6)	E (65.8)	A (6.6)	F (168.0)	D (48.0)	C (27.5)
		F (144.2)			F (118.8)			E (74.0)			E (56.2)		

US 17 at Lendire Access Road

This unsignalized intersection currently operates at LOS D during the AM peak and LOS E during the PM peak. In 2021 future no build conditions with future committed right-in right-out only configuration improvement, LOS C is expected in the AM and PM peaks. In future build conditions, LOS is expected to remain unchanged. Based on the NCDOT Turn Lane Warrants, it is recommended to provide a southbound right turn lane with 125 feet of storage and appropriate deceleration and taper. With this recommendation in place, this intersection is expected to remain at LOS C for both AM and PM peaks.

Note: This proposed southbound right turn lane should be coordinated with NCDOT during the design and permitting stage to determine the exact turn lane and taper dimensions due to the existing driveways located in the vicinity of this proposed widening.

Table 5.3 - US 17 at Lendire Access Road										
Scenario	LOS of Worst Approach	Level of Service by Approach (Delay in sec/veh)								
		Eastbound			Northbound			Southbound		
AM Peak Hour										
2019 Existing	D (29.3) EB Approach	L	T	R	L	T	R	L	T	R
		D (29.3)		D (29.3)	B (14.9)	A (0.0)			A (0.0)	A (0.0)
		D (29.3)			A (0.0)			A (0.0)		
2021 Future No Build	C (17.9) EB Approach	L	T	R	L	T	R	L	T	R
				C (17.9)					A (0.0)	A (0.0)
		C (17.9)						A (0.0)		
2021 Future Build	C (20.4) EB Approach	L	T	R	L	T	R	L	T	R
				C (20.4)					A (0.0)	A (0.0)
		C (20.4)						A (0.0)		
2021 Future Build + Improvements	C (19.8) EB Approach	L	T	R	L	T	R	L	T	R
				C (19.8)					A (0.0)	A (0.0)
		C (19.8)						A (0.0)		
PM Peak Hour										
2019 Existing	E (41.6) EB Approach	L	T	R	L	T	R	L	T	R
		E (41.6)		E (41.6)	B (14.7)	A (0.0)			A (0.0)	A (0.0)
		E (41.6)			A (0.1)			A (0.0)		
2021 Future No Build	C (17.1) EB Approach	L	T	R	L	T	R	L	T	R
				C (17.1)					A (0.0)	A (0.0)
		C (17.1)						A (0.0)		
2021 Future Build	C (19.5) EB Approach	L	T	R	L	T	R	L	T	R
				C (19.5)					A (0.0)	A (0.0)
		C (19.5)						A (0.0)		
2021 Future Build + Improvements	C (18.4) EB Approach	L	T	R	L	T	R	L	T	R
				C (18.4)					A (0.0)	A (0.0)
		C (18.4)						A (0.0)		

Lendire Road / Middle Sound Loop Road at Lendire Access Road

This unsignalized intersection currently operates at LOS B during both the AM and PM peaks. In 2021 future no build conditions and future build conditions, LOS is expected to remain unchanged. Therefore, no improvements are recommended to accommodate the future build traffic.

Table 5.4 - Lendire Road / Middle Sound Loop Road at Lendire Access Road										
Scenario	LOS of Worst Approach	Level of Service by Approach (Delay in sec/veh)								
		Westbound			Northbound			Southbound		
AM Peak Hour										
2019 Existing	B (10.3) WB Approach	L	T	R	L	T	R	L	T	R
		B (10.3)		B (10.3)		A (0.0)	A (0.0)	A (7.5)	A (0.0)	
		B (10.3)			A (0.0)			A (0.3)		
2021 Future No Build	B (10.8) WB Approach	L	T	R	L	T	R	L	T	R
		B (10.8)		B (10.8)		A (0.0)	A (0.0)	A (7.5)	A (0.0)	
		B (10.8)			A (0.0)			A (0.3)		
2021 Future Build	B (12.0) WB Approach	L	T	R	L	T	R	L	T	R
		B (12.0)		B (12.0)		A (0.0)	A (0.0)	A (7.6)	A (0.0)	
		B (12.0)			A (0.0)			A (0.3)		
PM Peak Hour										
2019 Existing	B (11.6) WB Approach	L	T	R	L	T	R	L	T	R
		B (11.6)		B (11.6)		A (0.0)	A (0.0)	A (7.9)	A (0.0)	
		B (11.6)			A (0.0)			A (0.3)		
2021 Future No Build	B (12.0) WB Approach	L	T	R	L	T	R	L	T	R
		B (12.0)		B (12.0)		A (0.0)	A (0.0)	A (8.0)	A (0.0)	
		B (12.0)			A (0.0)			A (0.3)		
2021 Future Build	B (13.3) WB Approach	L	T	R	L	T	R	L	T	R
		B (13.3)		B (13.3)		A (0.0)	A (0.0)	A (8.1)	A (0.0)	
		B (13.3)			A (0.0)			A (0.2)		

Lendire Road at Site Access 1

This access is proposed to have a full movement configuration. In 2021 future build conditions, LOS B is expected during the AM and PM peaks. Based on the NCDOT Turn Lane Warrants, it is recommended to provide a westbound right turn lane with 50 feet of storage and appropriate deceleration and taper. With this recommendation in place, this intersection is expected to remain at LOS B for both AM and PM peaks.

Table 5.5 - Lendire Road at Site Access 1										
Scenario	LOS of Worst Approach	Level of Service by Approach (Delay in sec/veh)								
		Eastbound			Westbound			Southbound		
AM Peak Hour										
2021 Future Build	B (12.8) SB Approach	L	T	R	L	T	R	L	T	R
		A (7.5)	A (0.0)		A (0.0)	A (0.0)		B (12.8)		B (12.8)
		A (0.1)			A (0.0)			B (12.8)		
2021 Future Build + Improvements	B (12.6) SB Approach	L	T	R	L	T	R	L	T	R
		A (7.5)	A (0.0)		A (0.0)	A (0.0)		B (12.6)		B (12.6)
		A (0.1)			A (0.0)			B (12.6)		
PM Peak Hour										
2021 Future Build	B (13.7) SB Approach	L	T	R	L	T	R	L	T	R
		A (8.2)	A (0.0)		A (0.0)	A (0.0)		B (13.7)		B (13.7)
		A (0.2)			A (0.0)			B (13.7)		
2021 Future Build + Improvements	B (13.3) SB Approach	L	T	R	L	T	R	L	T	R
		A (8.2)	A (0.0)		A (0.0)	A (0.0)		B (13.3)		B (13.3)
		A (0.2)			A (0.0)			B (13.3)		

Lendire Access Road at Site Access 2

This access is proposed to have a full movement configuration. In 2021 future build conditions, LOS A is expected during the AM and PM peaks. Based on the NCDOT Turn Lane Warrants, no turn lanes are warranted. Therefore, no improvements are recommended to accommodate future build traffic.

Table 5.6 - Lendire Access Road at Site Access 2										
Scenario	LOS of Worst Approach	Level of Service by Approach (Delay in sec/veh)								
		Eastbound			Westbound			Southbound		
AM Peak Hour										
2021 Future Build	A (8.9) SB Approach	L	T	R	L	T	R	L	T	R
		A (7.3)	A (0.0)		A (0.0)	A (0.0)	A (8.9)		A (8.9)	
		A (2.7)			A (0.0)			A (8.9)		
PM Peak Hour										
2021 Future Build	A (9.0) SB Approach	L	T	R	L	T	R	L	T	R
		A (7.4)	A (0.0)		A (0.0)	A (0.0)	A (9.0)		A (9.0)	
		A (6.2)			A (0.0)			A (9.0)		

6.0 Queue Results

Below in Table 6.1 are the queue results for all exclusive turn lanes. Recommended improvements are illustrated in Figure 9.

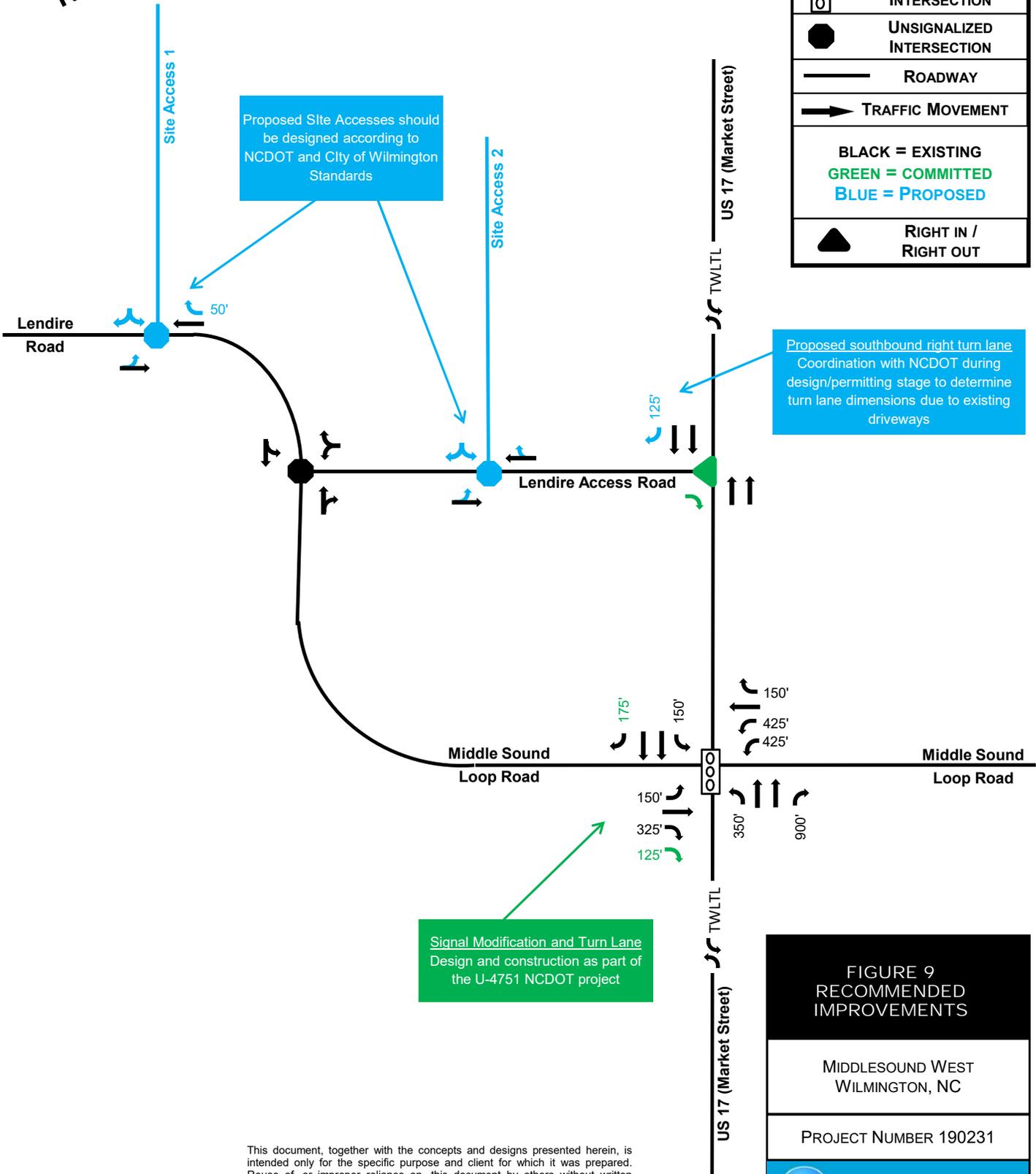
Scenario	US 17 at Middle Sound Loop Road								US 17 at Lendire Access Road		Middle Sound Loop Road / Lendire Road at Lendire Access Road	Lendire Road at Site Access 1		Lendire Access Road at Site Access 2
Existing	EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR	EBLR	SBR	WBLR	WBR	SBLR	SBLR
Max Queue (ft)	90	300	380	200	116	53	149	225	53		459			
95th Percentile Queue (ft)	143	473	359	163	81	34	83	24	4		5			
Storage Bay (ft)	150	325	425	150	350	900	150	125	FULL		FULL			
2021 No Build	EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR	EBR	SBR	WBLR	WBR	SBLR	SBLR
Max Queue (ft)	197	268	409	200	350	76	149	275	30		49			
95th Percentile Queue (ft)	204	223	335	161	286	44	167	59	2		4			
Storage Bay (ft)	150	325	425	150	350	900	150	175	FULL		FULL			
2021 Build	EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR	EBR	SBR	WBLR	WBR	SBLR	SBLR
Max Queue (ft)	199	214	330	191	349	63	149	275	116		27		67	31
95th Percentile Queue (ft)	254	223	336	167	327	45	172	60	15		6		8	4
Storage Bay (ft)	150	325	425	150	350	900	150	175	FULL		FULL		FULL	FULL
2021 Build + Imps	EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR	EBR	SBR	WBLR	WBR	SBLR	SBLR
Max Queue (ft)									76	0		0	73	
95th Percentile Queue (ft)									14	0		0	8	
Storage Bay (ft)									FULL	125		50	FULL	

PM Peak Hour Queues

Scenario	US 17 at Middle Sound Loop Road								US 17 at Lendire Access Road		Middle Sound Loop Road / Lendire Road at Lendire Access Road		Lendire Road at Site Access 1		Lendire Access Road at Site Access 2	
	EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR	EBLR	SBR	WBLR	WBR	SBLR	SBLR	SBLR	
Existing	EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR	EBLR	SBR	WBLR	WBR	SBLR	SBLR		
Max Queue (ft)	200	300	341	200	349	153	150	225	31		49					
95th Percentile Queue (ft)	312	355	419	338	136	99	272	28	3		7					
Storage Bay (ft)	150	325	425	150	350	900	150	125	FULL		FULL					
2021 No Build	EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR	EBR	SBR	WBLR	WBR	SBLR	SBLR		
Max Queue (ft)	200	228	370	200	350	975	150	275	0		49					
95th Percentile Queue (ft)	330	200	397	307	706	164	337	89	0		7					
Storage Bay (ft)	150	325	425	150	350	900	150	175	FULL		FULL					
2021 Build	EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR	EBR	SBR	WBLR	WBR	SBLR	SBLR		
Max Queue (ft)	200	272	318	200	350	975	150	275	53		49		48	54		
95th Percentile Queue (ft)	421	198	396	315	842	169	349	95	11		10		8	4		
Storage Bay (ft)	150	325	425	150	350	900	150	175	FULL		FULL		FULL	FULL		
2021 Build + Imps	EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR	EBR	SBR	WBLR	WBR	SBLR	SBLR		
Max Queue (ft)									93	225		0	69			
95th Percentile Queue (ft)									10	0		0	8			
Storage Bay (ft)									FULL	125		50	FULL			



LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	ROADWAY
	TRAFFIC MOVEMENT
BLACK = EXISTING GREEN = COMMITTED BLUE = PROPOSED	
	RIGHT IN / RIGHT OUT



Proposed southbound right turn lane
 Coordination with NCDOT during design/permitting stage to determine turn lane dimensions due to existing driveways

Signal Modification and Turn Lane Design and construction as part of the U-4751 NCDOT project

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**FIGURE 9
 RECOMMENDED
 IMPROVEMENTS**

MIDDLESOUND WEST
 WILMINGTON, NC

PROJECT NUMBER 190231

*** NOT TO SCALE ***

7.0 Summary and Conclusion

The Middlesound West development is to be located on the north quadrant of the intersection of Middle Sound Loop Road and Lendire Road in Wilmington, North Carolina. As currently planned, this site development proposes 49 dwelling units of multifamily housing (low-rise), 240 dwelling units of multifamily housing (mid-rise), and 32 employee small office building. Two (2) accesses are proposed to the site, one full access on Lendire Road and one full access on Lendire Access Road.

Based on trip generation rates and equations published in Trip Generation (Institute of Transportation Engineers, 10th Edition), this development has a trip generation potential of 140 trips in the AM peak and 190 trips in the PM peak.

DAVENPORT was retained to determine the potential traffic impacts of this development and to identify transportation improvements that may be required to accommodate the impacts of both background traffic and new development traffic.

Based on analysis and queues, US 17 at Middle Sound Loop Road will have oversaturated traffic operations. While LOS E is not ideal, with the addition of the committed improvements to add dual right turn lanes on the eastbound approach and extending the southbound right turn lane to 175 feet of storage, this intersection will be built out and improved to the maximum extent. Therefore, there is no additional right of way available to provide additional intersection approach lane improvements.

Intersection	2021 Future Build
US 17 at Middle Sound Loop Road	<ul style="list-style-type: none"> No improvements recommended
US 17 at Lendire Access Road	<ul style="list-style-type: none"> Provide southbound right turn lane with 125 feet of storage and appropriate taper Coordinate with NCDOT during design and permitting stage to determine the exact turn lane dimensions due to the existing driveways
Middle Sound Loop Road at Lendire Road	<ul style="list-style-type: none"> No improvements recommended
Lendire Road at Site Access 1	<ul style="list-style-type: none"> Provide westbound right turn lane with 50 feet of storage and appropriate taper
Lendire Road at Site Access 2	<ul style="list-style-type: none"> No improvements recommended

In conclusion, this study has reviewed the impacts of both background traffic and this development traffic. Please note that all site accesses should be designed according to the City of Wilmington Standards.

Appendix

Trip Generation

Table A - ITE Trip Generation

Middlesound West

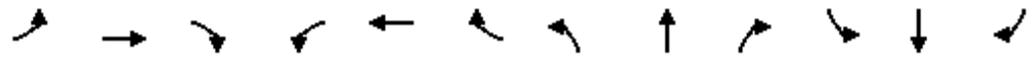
Average Weekday Driveway Volumes				24 Hour Two-Way	AM Peak Hour		PM Peak Hour	
<u>Land Use</u>	<u>ITE Land Code</u>	<u>Size</u>	<u>Method/ Type</u>	<u>Volume</u>	<u>Enter</u>	<u>Exit</u>	<u>Enter</u>	<u>Exit</u>
Multifamily Housing (Low-Rise)	220	24.0	Dwelling Units	141	3	9	10	6
Multifamily Housing (Mid-Rise)	221	264.0	Dwelling Units	1,437	23	66	69	44
Small Office Building	712	32.0	Employees	255	25	14	29	32
Total Unadjusted Trips				1,833	51	89	108	82

Level of Service Analysis

US 17 at Middle Sound Loop Road

Lanes, Volumes, Timings
 100: US 17 (Market Street) & Middle Sound Loop Road

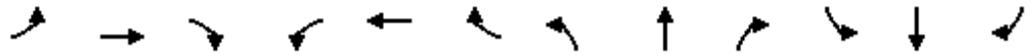
06/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	47	248	484	68	121	84	1163	131	93	1375	47
Future Volume (vph)	73	47	248	484	68	121	84	1163	131	93	1375	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		275	425		150	350		900	150		125
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	50			100			0			0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	3433	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.095			0.103		
Satd. Flow (perm)	1770	1863	1583	3433	1863	1583	177	3539	1583	192	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		888			1764			1536			412	
Travel Time (s)		17.3			34.4			23.3			6.2	
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)	81	52	276	538	76	134	93	1292	146	103	1528	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	81	52	276	538	76	134	93	1292	146	103	1528	52
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8	2		2	6		6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	12.0	5.0	5.0	12.0	5.0
Minimum Split (s)	10.6	10.8	10.8	10.8	10.8	11.1	10.8	18.1	10.8	11.1	18.1	10.6
Total Split (s)	17.0	17.0	16.0	34.0	34.0	26.0	16.0	79.0	34.0	26.0	89.0	17.0
Total Split (%)	10.9%	10.9%	10.3%	21.8%	21.8%	16.7%	10.3%	50.6%	21.8%	16.7%	57.1%	10.9%
Maximum Green (s)	11.4	11.2	10.2	28.2	28.2	19.9	10.2	72.9	28.2	19.9	82.9	11.4
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.5	3.0	3.0	4.5	3.0
All-Red Time (s)	2.6	2.0	2.8	2.8	2.0	3.1	2.8	1.6	2.8	3.1	1.6	2.6
Lost Time Adjust (s)	-0.6	-0.8	-0.8	-0.8	-0.8	-1.1	-0.8	-1.1	-0.8	-1.1	-1.1	-0.6
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes											
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0	2.0	2.0	6.0	2.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	3.0	0.2	0.2	3.0	0.2
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	0.0
Recall Mode	None	C-Max	None	None	C-Max	None						
Act Effect Green (s)	10.7	9.3	23.1	28.0	24.4	39.9	90.5	90.5	119.4	89.9	89.9	100.6
Actuated g/C Ratio	0.07	0.06	0.15	0.18	0.16	0.26	0.58	0.58	0.77	0.58	0.58	0.64
v/c Ratio	0.67	0.47	1.18	0.87	0.26	0.33	0.43	0.63	0.12	0.48	0.75	0.05
Control Delay	96.8	84.0	170.4	78.0	58.2	47.6	43.9	25.2	3.3	24.0	28.9	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.8	84.0	170.4	78.0	58.2	47.6	43.9	25.2	3.3	24.0	28.9	6.4

Lanes, Volumes, Timings
 100: US 17 (Market Street) & Middle Sound Loop Road

06/20/2019

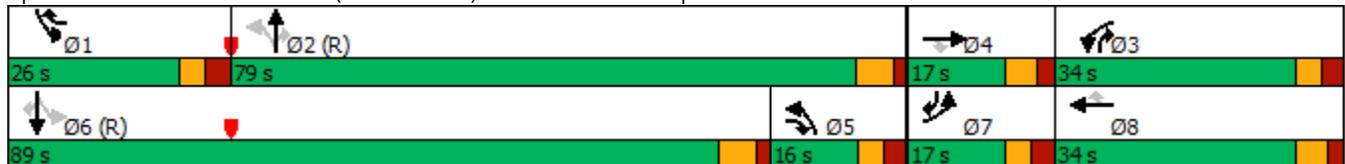


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	F	F	F	E	E	D	D	C	A	C	C	A
Approach Delay		144.8			70.6			24.2			27.9	
Approach LOS		F			E			C			C	
Queue Length 50th (ft)	81	52	~309	274	67	110	43	472	16	49	634	12
Queue Length 95th (ft)	#143	99	#473	#359	118	163	81	607	34	83	748	24
Internal Link Dist (ft)		808			1684			1456			332	
Turn Bay Length (ft)	150		275	425		150	350		900	150		125
Base Capacity (vph)	136	143	234	646	346	511	214	2052	1226	322	2039	1034
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.36	1.18	0.83	0.22	0.26	0.43	0.63	0.12	0.32	0.75	0.05

Intersection Summary

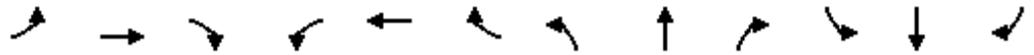
Area Type: Other
 Cycle Length: 156
 Actuated Cycle Length: 156
 Offset: 124 (79%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.18
 Intersection Signal Delay: 44.9 Intersection LOS: D
 Intersection Capacity Utilization 79.7% ICU Level of Service D
 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: 100: US 17 (Market Street) & Middle Sound Loop Road



Lanes, Volumes, Timings
 100: US 17 (Market Street) & Middle Sound Loop Road

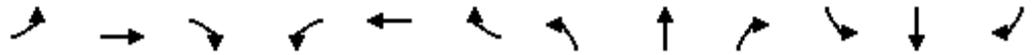
06/21/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	59	291	494	80	123	133	1179	134	95	1403	48
Future Volume (vph)	123	59	291	494	80	123	133	1179	134	95	1403	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		125	425		150	350		900	150		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	50			100			0			0		
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850				0.850			0.850		0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	2787	3433	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	2787	3433	1863	1583	1770	3539	1583	1770	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		359			1764			1536			410	
Travel Time (s)		7.0			34.4			23.3			6.2	
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)	137	66	323	549	89	137	148	1310	149	106	1559	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	137	66	323	549	89	137	148	1310	149	106	1559	53
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	12.0	5.0	5.0	12.0	12.0
Minimum Split (s)	10.6	10.8	10.8	10.8	10.8	11.1	10.8	18.1	10.8	11.1	18.1	18.1
Total Split (s)	55.0	52.9	19.9	13.1	11.0	20.0	19.9	70.0	13.1	20.0	70.1	70.1
Total Split (%)	35.3%	33.9%	12.8%	8.4%	7.1%	12.8%	12.8%	44.9%	8.4%	12.8%	44.9%	44.9%
Maximum Green (s)	49.4	47.1	14.1	7.3	5.2	13.9	14.1	63.9	7.3	13.9	64.0	64.0
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.5	3.0	3.0	4.5	4.5
All-Red Time (s)	2.6	2.0	2.8	2.8	2.0	3.1	2.8	1.6	2.8	3.1	1.6	1.6
Lost Time Adjust (s)	-0.6	-0.8	-0.8	-0.8	-0.8	-1.1	-0.8	-1.1	-0.8	-1.1	-1.1	-0.6
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.5
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0	2.0	2.0	6.0	6.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	3.0	0.2	0.2	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	30.0
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	C-Max
Act Effect Green (s)	17.2	10.8	28.4	44.8	36.1	55.9	14.9	67.9	113.7	14.8	67.8	67.3
Actuated g/C Ratio	0.11	0.07	0.18	0.29	0.23	0.36	0.10	0.44	0.73	0.09	0.43	0.43
v/c Ratio	0.70	0.52	0.64	0.56	0.21	0.24	0.88	0.85	0.13	0.63	1.01	0.08
Control Delay	85.2	83.3	64.2	51.6	52.7	37.5	111.3	46.2	4.4	83.8	69.8	25.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.2	83.3	64.2	51.6	52.7	37.5	111.3	46.2	4.4	83.8	69.8	25.8

Lanes, Volumes, Timings
 100: US 17 (Market Street) & Middle Sound Loop Road

06/21/2019

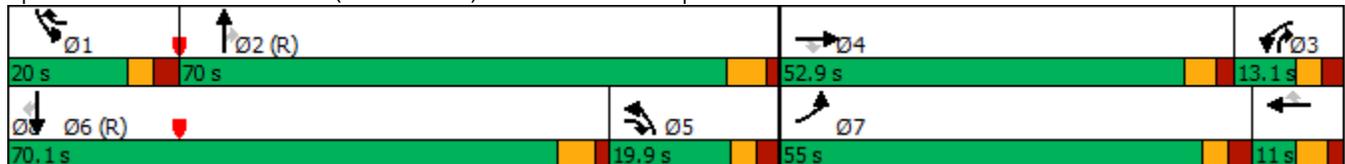


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	F	F	E	D	D	D	F	D	A	F	E	C
Approach Delay		72.1			49.2			48.3			69.3	
Approach LOS		E			D			D			E	
Queue Length 50th (ft)	137	66	172	248	73	97	152	633	22	106	~893	32
Queue Length 95th (ft)	204	117	223	335	137	161	#286	751	44	167	#983	59
Internal Link Dist (ft)		279			1684			1456			330	
Turn Bay Length (ft)	150		125	425		150	350		900	150		175
Base Capacity (vph)	567	572	506	986	430	584	169	1539	1153	187	1537	682
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.12	0.64	0.56	0.21	0.23	0.88	0.85	0.13	0.57	1.01	0.08

Intersection Summary

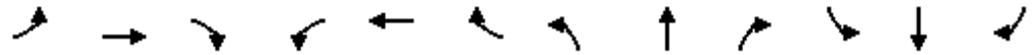
Area Type: Other
 Cycle Length: 156
 Actuated Cycle Length: 156
 Offset: 124 (79%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 59.0 Intersection LOS: E
 Intersection Capacity Utilization 79.4% ICU Level of Service D
 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: 100: US 17 (Market Street) & Middle Sound Loop Road



Lanes, Volumes, Timings
 100: US 17 (Market Street) & Middle Sound Loop Road

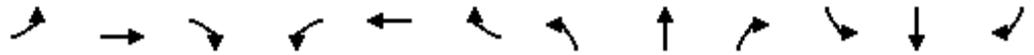
06/21/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	63	295	494	85	123	153	1179	134	99	1434	48
Future Volume (vph)	163	63	295	494	85	123	153	1179	134	99	1434	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		125	425		150	350		900	150		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	50			100			0			0		
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850				0.850			0.850		0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	2787	3433	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	2787	3433	1863	1583	1770	3539	1583	1770	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		362			1764			1536			410	
Travel Time (s)		7.1			34.4			23.3			6.2	
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)	181	70	328	549	94	137	170	1310	149	110	1593	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	181	70	328	549	94	137	170	1310	149	110	1593	53
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	12.0	5.0	5.0	12.0	12.0
Minimum Split (s)	10.6	10.8	10.8	10.8	10.8	11.1	10.8	18.1	10.8	11.1	18.1	18.1
Total Split (s)	57.2	55.3	21.1	13.1	11.2	19.4	21.1	68.2	13.1	19.4	66.5	66.5
Total Split (%)	36.7%	35.4%	13.5%	8.4%	7.2%	12.4%	13.5%	43.7%	8.4%	12.4%	42.6%	42.6%
Maximum Green (s)	51.6	49.5	15.3	7.3	5.4	13.3	15.3	62.1	7.3	13.3	60.4	60.4
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.5	3.0	3.0	4.5	4.5
All-Red Time (s)	2.6	2.0	2.8	2.8	2.0	3.1	2.8	1.6	2.8	3.1	1.6	1.6
Lost Time Adjust (s)	-0.6	-0.8	-0.8	-0.8	-0.8	-1.1	-0.8	-1.1	-0.8	-1.1	-1.1	-0.6
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.5
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0	2.0	2.0	6.0	6.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	3.0	0.2	0.2	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	30.0
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	C-Max
Act Effect Green (s)	21.2	11.1	32.2	43.3	33.2	53.6	16.1	66.1	109.4	15.5	65.5	65.0
Actuated g/C Ratio	0.14	0.07	0.21	0.28	0.21	0.34	0.10	0.42	0.70	0.10	0.42	0.42
v/c Ratio	0.75	0.53	0.57	0.58	0.24	0.25	0.93	0.87	0.13	0.63	1.07	0.08
Control Delay	83.5	83.4	59.5	52.7	56.3	39.7	119.4	48.8	4.7	82.6	88.2	26.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.5	83.4	59.5	52.7	56.3	39.7	119.4	48.8	4.7	82.6	88.2	26.9

Lanes, Volumes, Timings
 100: US 17 (Market Street) & Middle Sound Loop Road

06/21/2019

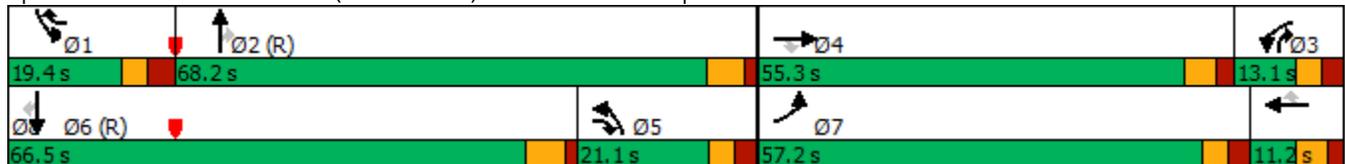


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	F	F	E	D	E	D	F	D	A	F	F	C
Approach Delay		69.9			50.8			52.1			86.0	
Approach LOS		E			D			D			F	
Queue Length 50th (ft)	180	70	172	249	80	100	175	637	22	110	~944	32
Queue Length 95th (ft)	254	122	223	336	149	167	#327	761	45	172	#1037	60
Internal Link Dist (ft)		282			1684			1456			330	
Turn Bay Length (ft)	150		125	425		150	350		900	150		175
Base Capacity (vph)	592	600	575	952	395	556	182	1500	1110	189	1486	659
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.12	0.57	0.58	0.24	0.25	0.93	0.87	0.13	0.58	1.07	0.08

Intersection Summary

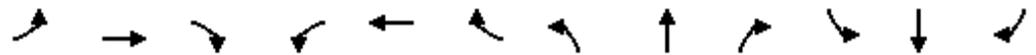
Area Type: Other
 Cycle Length: 156
 Actuated Cycle Length: 156
 Offset: 124 (79%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.07
 Intersection Signal Delay: 66.6
 Intersection LOS: E
 Intersection Capacity Utilization 81.4%
 ICU Level of Service D
 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: 100: US 17 (Market Street) & Middle Sound Loop Road



Lanes, Volumes, Timings
 100: US 17 (Market Street) & Middle Sound Loop Road

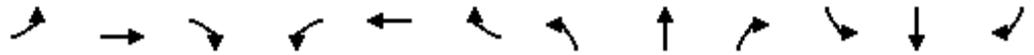
06/20/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	87	118	285	77	117	148	1789	333	109	1297	63
Future Volume (vph)	84	87	118	285	77	117	148	1789	333	109	1297	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		275	425		150	350		900	150		125
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	50			100			0			0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	3433	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.151			0.045		
Satd. Flow (perm)	1770	1863	1583	3433	1863	1583	281	3539	1583	84	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		880			1764			1536			412	
Travel Time (s)		17.1			34.4			23.3			6.2	
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)	93	97	131	317	86	130	164	1988	370	121	1441	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	93	97	131	317	86	130	164	1988	370	121	1441	70
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8	2		2	6		6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	12.0	5.0	5.0	12.0	5.0
Minimum Split (s)	10.6	10.8	10.8	10.8	10.8	11.1	10.8	18.1	10.8	11.1	18.1	10.6
Total Split (s)	25.0	25.0	20.0	37.0	37.0	20.0	20.0	222.0	37.0	20.0	222.0	25.0
Total Split (%)	8.2%	8.2%	6.6%	12.2%	12.2%	6.6%	6.6%	73.0%	12.2%	6.6%	73.0%	8.2%
Maximum Green (s)	19.4	19.2	14.2	31.2	31.2	13.9	14.2	215.9	31.2	13.9	215.9	19.4
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.5	3.0	3.0	4.5	3.0
All-Red Time (s)	2.6	2.0	2.8	2.8	2.0	3.1	2.8	1.6	2.8	3.1	1.6	2.6
Lost Time Adjust (s)	-0.6	-0.8	-0.8	-0.8	-0.8	-1.1	-0.8	-1.1	-0.8	-1.1	-1.1	-0.6
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes											
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0	2.0	2.0	6.0	2.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	3.0	0.2	0.2	3.0	0.2
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	0.0
Recall Mode	None	C-Max	None	None	C-Max	None						
Act Effect Green (s)	18.7	18.7	38.7	30.8	30.9	50.1	220.2	220.2	251.0	219.5	219.5	238.1
Actuated g/C Ratio	0.06	0.06	0.13	0.10	0.10	0.16	0.72	0.72	0.83	0.72	0.72	0.78
v/c Ratio	0.86	0.85	0.65	0.91	0.46	0.50	0.59	0.78	0.28	0.87	0.56	0.06
Control Delay	192.1	188.8	141.8	163.7	136.6	122.3	43.4	29.6	3.7	99.3	21.1	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	192.1	188.8	141.8	163.7	136.6	122.3	43.4	29.6	3.7	99.3	21.1	4.1

Lanes, Volumes, Timings
 100: US 17 (Market Street) & Middle Sound Loop Road

06/20/2019

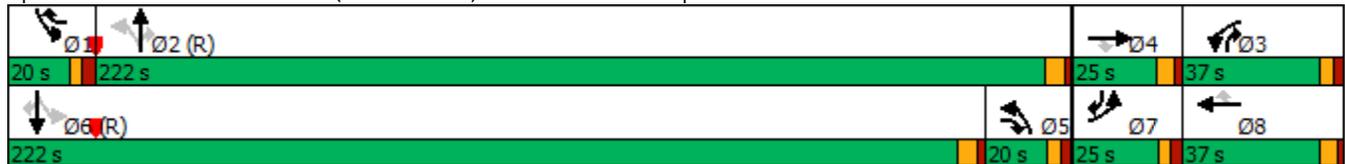


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	F	F	F	F	F	F	D	C	A	F	C	A
Approach Delay		170.6			149.2			26.7			26.2	
Approach LOS		F			F			C			C	
Queue Length 50th (ft)	190	198	256	332	167	242	102	1343	81	129	719	18
Queue Length 95th (ft)	#312	#320	355	#419	245	338	136	1387	99	#272	762	28
Internal Link Dist (ft)		800			1684			1456			332	
Turn Bay Length (ft)	150		275	425		150	350		900	150		125
Base Capacity (vph)	116	122	201	361	196	265	277	2563	1313	144	2555	1247
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.80	0.65	0.88	0.44	0.49	0.59	0.78	0.28	0.84	0.56	0.06

Intersection Summary

Area Type: Other
 Cycle Length: 304
 Actuated Cycle Length: 304
 Offset: 25 (8%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 48.8 Intersection LOS: D
 Intersection Capacity Utilization 82.8% 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: 100: US 17 (Market Street) & Middle Sound Loop Road



Lanes, Volumes, Timings
 100: US 17 (Market Street) & Middle Sound Loop Road

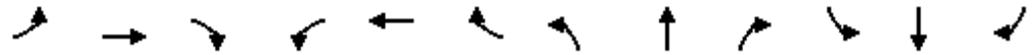
06/21/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	94	136	291	84	119	176	1816	340	111	1323	64
Future Volume (vph)	107	94	136	291	84	119	176	1816	340	111	1323	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		125	425		150	350		900	150		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	50			100			0			0		
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	2787	3433	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	2787	3433	1863	1583	1770	3539	1583	1770	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		367			1764			1536			410	
Travel Time (s)		7.1			34.4			23.3			6.2	
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)	119	104	151	323	93	132	196	2018	378	123	1470	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	119	104	151	323	93	132	196	2018	378	123	1470	71
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	12.0	5.0	5.0	12.0	12.0
Minimum Split (s)	10.6	10.8	10.8	10.8	10.8	11.1	10.8	18.1	10.8	11.1	18.1	18.1
Total Split (s)	66.0	69.8	32.0	19.2	23.0	46.9	32.0	168.1	19.2	46.9	183.0	183.0
Total Split (%)	21.7%	23.0%	10.5%	6.3%	7.6%	15.4%	10.5%	55.3%	6.3%	15.4%	60.2%	60.2%
Maximum Green (s)	60.4	64.0	26.2	13.4	17.2	40.8	26.2	162.0	13.4	40.8	176.9	176.9
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.5	3.0	3.0	4.5	4.5
All-Red Time (s)	2.6	2.0	2.8	2.8	2.0	3.1	2.8	1.6	2.8	3.1	1.6	1.6
Lost Time Adjust (s)	-0.6	-0.8	-0.8	-0.8	-0.8	-1.1	-0.8	-1.1	-0.8	-1.1	-1.1	-0.6
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.5
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes											
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0	2.0	2.0	6.0	6.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	3.0	0.2	0.2	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	30.0
Recall Mode	None	C-Max	None	None	C-Max	C-Max						
Act Effect Green (s)	25.5	22.3	54.3	49.8	46.6	78.2	27.0	185.3	235.1	26.6	184.9	184.4
Actuated g/C Ratio	0.08	0.07	0.18	0.16	0.15	0.26	0.09	0.61	0.77	0.09	0.61	0.61
v/c Ratio	0.80	0.76	0.30	0.57	0.33	0.32	1.25	0.94	0.31	0.80	0.68	0.07
Control Delay	171.5	170.1	109.3	123.5	121.3	95.1	250.4	62.8	6.3	168.8	41.7	24.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	171.5	170.1	109.3	123.5	121.3	95.1	250.4	62.8	6.3	168.8	41.7	24.4

Lanes, Volumes, Timings
 100: US 17 (Market Street) & Middle Sound Loop Road

06/21/2019

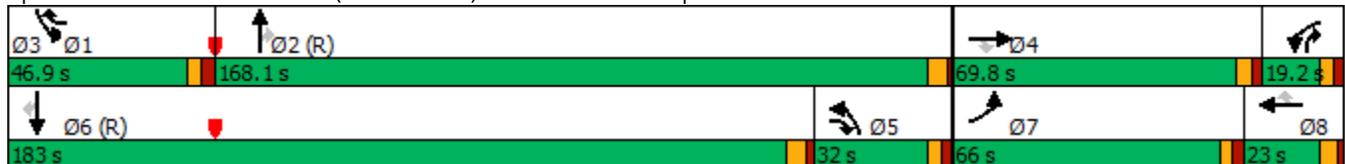


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	F	F	F	F	F	F	F	E	A	F	D	C
Approach Delay		146.0			116.3			68.8			50.4	
Approach LOS		F			F			E			D	
Queue Length 50th (ft)	241	211	153	321	173	223	-489	1873	105	249	1006	57
Queue Length 95th (ft)	330	295	200	397	260	307	#706	2105	164	337	1077	89
Internal Link Dist (ft)		287			1684			1456			330	
Turn Bay Length (ft)	150		125	425		150	350		900	150		175
Base Capacity (vph)	355	397	497	562	285	486	157	2157	1224	243	2152	960
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.26	0.30	0.57	0.33	0.27	1.25	0.94	0.31	0.51	0.68	0.07

Intersection Summary

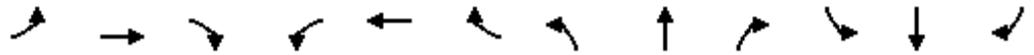
Area Type: Other
 Cycle Length: 304
 Actuated Cycle Length: 304
 Offset: 25 (8%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.25
 Intersection Signal Delay: 73.5
 Intersection LOS: E
 Intersection Capacity Utilization 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: 100: US 17 (Market Street) & Middle Sound Loop Road



Lanes, Volumes, Timings
 100: US 17 (Market Street) & Middle Sound Loop Road

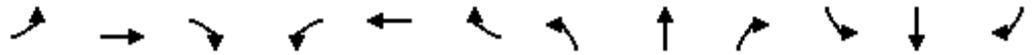
06/21/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	98	140	291	95	119	219	1816	340	115	1352	64
Future Volume (vph)	144	98	140	291	95	119	219	1816	340	115	1352	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		125	425		150	350		900	150		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	50			100			0			0		
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	2787	3433	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	2787	3433	1863	1583	1770	3539	1583	1770	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		360			1764			1536			410	
Travel Time (s)		7.0			34.4			23.3			6.2	
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)	160	109	156	323	106	132	243	2018	378	128	1502	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	160	109	156	323	106	132	243	2018	378	128	1502	71
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	12.0	5.0	5.0	12.0	12.0
Minimum Split (s)	10.6	10.8	10.8	10.8	10.8	11.1	10.8	18.1	10.8	11.1	18.1	18.1
Total Split (s)	68.0	72.0	38.0	19.2	23.2	48.3	38.0	164.5	19.2	48.3	174.8	174.8
Total Split (%)	22.4%	23.7%	12.5%	6.3%	7.6%	15.9%	12.5%	54.1%	6.3%	15.9%	57.5%	57.5%
Maximum Green (s)	62.4	66.2	32.2	13.4	17.4	42.2	32.2	158.4	13.4	42.2	168.7	168.7
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.5	3.0	3.0	4.5	4.5
All-Red Time (s)	2.6	2.0	2.8	2.8	2.0	3.1	2.8	1.6	2.8	3.1	1.6	1.6
Lost Time Adjust (s)	-0.6	-0.8	-0.8	-0.8	-0.8	-1.1	-0.8	-1.1	-0.8	-1.1	-1.1	-0.6
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.5
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes											
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0	2.0	2.0	6.0	6.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	3.0	0.2	0.2	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	30.0
Recall Mode	None	C-Max	None	None	C-Max	C-Max						
Act Effect Green (s)	32.7	23.1	61.1	50.3	40.8	73.2	33.0	183.1	233.4	27.5	177.6	177.1
Actuated g/C Ratio	0.11	0.08	0.20	0.17	0.13	0.24	0.11	0.60	0.77	0.09	0.58	0.58
v/c Ratio	0.84	0.77	0.28	0.57	0.43	0.35	1.27	0.95	0.31	0.80	0.73	0.08
Control Delay	166.6	170.0	103.3	123.0	129.9	99.8	247.6	65.8	6.6	168.0	48.0	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	166.6	170.0	103.3	123.0	129.9	99.8	247.6	65.8	6.6	168.0	48.0	27.5

Lanes, Volumes, Timings
 100: US 17 (Market Street) & Middle Sound Loop Road

06/21/2019



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	F	F	F	F	F	F	F	E	A	F	D	C
Approach Delay		144.2			118.8			74.0			56.2	
Approach LOS		F			F			E			E	
Queue Length 50th (ft)	324	221	154	321	204	229	-612	1902	109	259	1110	60
Queue Length 95th (ft)	421	305	198	396	300	315	#842	2157	169	349	1196	95
Internal Link Dist (ft)		280			1684			1456			330	
Turn Bay Length (ft)	150		125	425		150	350		900	150		175
Base Capacity (vph)	366	410	560	568	249	463	192	2131	1215	252	2067	921
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.27	0.28	0.57	0.43	0.29	1.27	0.95	0.31	0.51	0.73	0.08

Intersection Summary

Area Type: Other
 Cycle Length: 304
 Actuated Cycle Length: 304
 Offset: 25 (8%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.27
 Intersection Signal Delay: 78.6 Intersection LOS: E
 Intersection Capacity Utilization 84.0% 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: 100: US 17 (Market Street) & Middle Sound Loop Road

Ø1	Ø2 (R)	Ø4	Ø8
48.3 s	164.5 s	72 s	19.2 s
Ø6 (R)	Ø5	Ø7	Ø8
174.8 s	38 s	68 s	23.2 s

US 17 at Lendire Access Road

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑↑	↑↑	
Traffic Vol, veh/h	4	5	7	1350	1510	17
Future Vol, veh/h	4	5	7	1350	1510	17
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	-	100	-	-	-
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	4	6	8	1500	1678	19

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2454	849	1697	0	-	0
Stage 1	1688	-	-	-	-	-
Stage 2	766	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	25	304	372	-	-	-
Stage 1	135	-	-	-	-	-
Stage 2	419	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	24	304	372	-	-	-
Mov Cap-2 Maneuver	99	-	-	-	-	-
Stage 1	132	-	-	-	-	-
Stage 2	419	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	29.3	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	372	-	158	-	-
HCM Lane V/C Ratio	0.021	-	0.063	-	-
HCM Control Delay (s)	14.9	-	29.3	-	-
HCM Lane LOS	B	-	D	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑	↑↑	
Traffic Vol, veh/h	0	5	0	1426	1591	17
Future Vol, veh/h	0	5	0	1426	1591	17
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	0	6	0	1584	1768	19

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	894	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	284	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %			
Mov Cap-1 Maneuver	-	284	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.9	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	284	-	-
HCM Lane V/C Ratio	-	0.02	-	-
HCM Control Delay (s)	-	17.9	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑	↑↑	
Traffic Vol, veh/h	0	41	0	1466	1591	40
Future Vol, veh/h	0	41	0	1466	1591	40
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	0	46	0	1629	1768	44

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	-	906	-	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-
Pot Cap-1 Maneuver	0	279	0	-	-
Stage 1	0	-	0	-	-
Stage 2	0	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	-	279	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 279	-	-
HCM Lane V/C Ratio	- 0.163	-	-
HCM Control Delay (s)	- 20.4	-	-
HCM Lane LOS	- C	-	-
HCM 95th %tile Q(veh)	- 0.6	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↕↕	↕↕	↗
Traffic Vol, veh/h	0	41	0	1466	1591	40
Future Vol, veh/h	0	41	0	1466	1591	40
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	-	-	-	125
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	0	46	0	1629	1768	44

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	884	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	288	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %			-
Mov Cap-1 Maneuver	-	288	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	-	288	-
HCM Lane V/C Ratio	-	0.158	-
HCM Control Delay (s)	-	19.8	-
HCM Lane LOS	-	C	-
HCM 95th %tile Q(veh)	-	0.6	-

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	TT		T	TT	TT	
Traffic Vol, veh/h	4	1	9	1981	1468	33
Future Vol, veh/h	4	1	9	1981	1468	33
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	-	100	-	-	-
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	4	1	10	2201	1631	37

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	2771	834	1668	0	-	0
Stage 1	1650	-	-	-	-	-
Stage 2	1121	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	15	311	381	-	-	-
Stage 1	142	-	-	-	-	-
Stage 2	273	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	15	311	381	-	-	-
Mov Cap-2 Maneuver	89	-	-	-	-	-
Stage 1	138	-	-	-	-	-
Stage 2	273	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	41.6	0.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	381	-	104	-	-
HCM Lane V/C Ratio	0.026	-	0.053	-	-
HCM Control Delay (s)	14.7	-	41.6	-	-
HCM Lane LOS	B	-	E	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑	↑↑	
Traffic Vol, veh/h	0	1	0	2042	1519	34
Future Vol, veh/h	0	1	0	2042	1519	34
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	0	1	0	2269	1688	38

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	863	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	298	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %			-
Mov Cap-1 Maneuver	-	298	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 298	-	-
HCM Lane V/C Ratio	- 0.004	-	-
HCM Control Delay (s)	- 17.1	-	-
HCM Lane LOS	- C	-	-
HCM 95th %tile Q(veh)	- 0	-	-

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑	↑↑	
Traffic Vol, veh/h	0	34	0	2079	1519	83
Future Vol, veh/h	0	34	0	2079	1519	83
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	0	38	0	2310	1688	92

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	890	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	286	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %			-
Mov Cap-1 Maneuver	-	286	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	-	286	-
HCM Lane V/C Ratio	-	0.132	-
HCM Control Delay (s)	-	19.5	-
HCM Lane LOS	-	C	-
HCM 95th %tile Q(veh)	-	0.5	-

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↕↕	↕↕	↗
Traffic Vol, veh/h	0	34	0	1466	1519	83
Future Vol, veh/h	0	34	0	1466	1519	83
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	-	-	-	125
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	0	38	0	1629	1688	92

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	844	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	307	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %			-
Mov Cap-1 Maneuver	-	307	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	-	307	-
HCM Lane V/C Ratio	-	0.123	-
HCM Control Delay (s)	-	18.4	-
HCM Lane LOS	-	C	-
HCM 95th %tile Q(veh)	-	0.4	-

*Middle Sound Loop Road at Lendire
Road*

Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	T
Traffic Vol, veh/h	14	23	80	19	15	335
Future Vol, veh/h	14	23	80	19	15	335
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	16	26	89	21	17	372

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	506	100	0	0	110	0
Stage 1	100	-	-	-	-	-
Stage 2	406	-	-	-	-	-
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	526	956	-	-	1480	-
Stage 1	924	-	-	-	-	-
Stage 2	673	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	519	956	-	-	1480	-
Mov Cap-2 Maneuver	519	-	-	-	-	-
Stage 1	911	-	-	-	-	-
Stage 2	673	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	725	1480
HCM Lane V/C Ratio	-	-	0.057	0.011
HCM Control Delay (s)	-	-	10.3	7.5
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	T
Traffic Vol, veh/h	14	16	100	19	15	353
Future Vol, veh/h	14	16	100	19	15	353
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	16	18	111	21	17	392

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	548	122	0	0	132	0
Stage 1	122	-	-	-	-	-
Stage 2	426	-	-	-	-	-
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	497	929	-	-	1453	-
Stage 1	903	-	-	-	-	-
Stage 2	659	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	490	929	-	-	1453	-
Mov Cap-2 Maneuver	490	-	-	-	-	-
Stage 1	889	-	-	-	-	-
Stage 2	659	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	655	1453
HCM Lane V/C Ratio	-	-	0.051	0.011
HCM Control Delay (s)	-	-	10.8	7.5
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	23	16	123	22	15	393
Future Vol, veh/h	23	16	123	22	15	393
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	26	18	137	24	17	437

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	620	149	0	0	161	0
Stage 1	149	-	-	-	-	-
Stage 2	471	-	-	-	-	-
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	452	898	-	-	1418	-
Stage 1	879	-	-	-	-	-
Stage 2	628	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	445	898	-	-	1418	-
Mov Cap-2 Maneuver	445	-	-	-	-	-
Stage 1	865	-	-	-	-	-
Stage 2	628	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	561	1418
HCM Lane V/C Ratio	-	-	0.077	0.012
HCM Control Delay (s)	-	-	12	7.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection						
Int Delay, s/veh	1.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	22	29	284	9	7	187
Future Vol, veh/h	22	29	284	9	7	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	-	-	-	-	-
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	24	32	316	10	8	208

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	545	321	0	0	326
Stage 1	321	-	-	-	-
Stage 2	224	-	-	-	-
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	499	720	-	-	1234
Stage 1	735	-	-	-	-
Stage 2	813	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	496	720	-	-	1234
Mov Cap-2 Maneuver	496	-	-	-	-
Stage 1	730	-	-	-	-
Stage 2	813	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.6	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	603	1234
HCM Lane V/C Ratio	-	-	0.094	0.006
HCM Control Delay (s)	-	-	11.6	7.9
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0

Intersection

Int Delay, s/veh 1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	22	21	304	9	7	196
Future Vol, veh/h	22	21	304	9	7	196
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	24	23	338	10	8	218

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	577	343	0
Stage 1	343	-	-
Stage 2	234	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	478	700	-
Stage 1	719	-	-
Stage 2	805	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	474	700	-
Mov Cap-2 Maneuver	474	-	-
Stage 1	713	-	-
Stage 2	805	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	563	1211
HCM Lane V/C Ratio	-	-	0.085	0.006
HCM Control Delay (s)	-	-	12	8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0

Intersection						
Int Delay, s/veh	1.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	21	353	14	7	233
Future Vol, veh/h	30	21	353	14	7	233
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	33	23	392	16	8	259

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	675	400	0	0	408
Stage 1	400	-	-	-	-
Stage 2	275	-	-	-	-
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	419	650	-	-	1151
Stage 1	677	-	-	-	-
Stage 2	771	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	416	650	-	-	1151
Mov Cap-2 Maneuver	416	-	-	-	-
Stage 1	672	-	-	-	-
Stage 2	771	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.3	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	488	1151
HCM Lane V/C Ratio	-	-	0.116	0.007
HCM Control Delay (s)	-	-	13.3	8.1
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0

Lendire Road at Site Access 1

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	3	368	116	23	40	4
Future Vol, veh/h	3	368	116	23	40	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	3	409	129	26	44	4

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	155	0	-	0	557 142
Stage 1	-	-	-	-	142 -
Stage 2	-	-	-	-	415 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1425	-	-	-	491 906
Stage 1	-	-	-	-	885 -
Stage 2	-	-	-	-	666 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1425	-	-	-	490 906
Mov Cap-2 Maneuver	-	-	-	-	490 -
Stage 1	-	-	-	-	882 -
Stage 2	-	-	-	-	666 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1425	-	-	-	511
HCM Lane V/C Ratio	0.002	-	-	-	0.096
HCM Control Delay (s)	7.5	0	-	-	12.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↑	↗	↘	
Traffic Vol, veh/h	3	368	116	23	40	4
Future Vol, veh/h	3	368	116	23	40	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	50	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	3	409	129	26	44	4

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	155	0	-	0	544 129
Stage 1	-	-	-	-	129 -
Stage 2	-	-	-	-	415 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1425	-	-	-	500 921
Stage 1	-	-	-	-	897 -
Stage 2	-	-	-	-	666 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1425	-	-	-	499 921
Mov Cap-2 Maneuver	-	-	-	-	499 -
Stage 1	-	-	-	-	894 -
Stage 2	-	-	-	-	666 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1425	-	-	-	521
HCM Lane V/C Ratio	0.002	-	-	-	0.094
HCM Control Delay (s)	7.5	0	-	-	12.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	5	203	325	49	37	4
Future Vol, veh/h	5	203	325	49	37	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	6	226	361	54	41	4

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	415	0	-	0	626 388
Stage 1	-	-	-	-	388 -
Stage 2	-	-	-	-	238 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1144	-	-	-	448 660
Stage 1	-	-	-	-	686 -
Stage 2	-	-	-	-	802 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1144	-	-	-	445 660
Mov Cap-2 Maneuver	-	-	-	-	445 -
Stage 1	-	-	-	-	682 -
Stage 2	-	-	-	-	802 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1144	-	-	-	460
HCM Lane V/C Ratio	0.005	-	-	-	0.099
HCM Control Delay (s)	8.2	0	-	-	13.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕	↕	↕	
Traffic Vol, veh/h	5	203	325	49	37	4
Future Vol, veh/h	5	203	325	49	37	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	50	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	6	226	361	54	41	4

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	415	0	-	0	599
Stage 1	-	-	-	-	361
Stage 2	-	-	-	-	238
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1144	-	-	-	465
Stage 1	-	-	-	-	705
Stage 2	-	-	-	-	802
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1144	-	-	-	462
Mov Cap-2 Maneuver	-	-	-	-	462
Stage 1	-	-	-	-	701
Stage 2	-	-	-	-	802

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1144	-	-	-	477
HCM Lane V/C Ratio	0.005	-	-	-	0.096
HCM Control Delay (s)	8.2	0	-	-	13.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Lendire Access Road at Site Access 2

Intersection						
Int Delay, s/veh	4.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	3	5	17	23	36	9
Future Vol, veh/h	3	5	17	23	36	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	3	6	19	26	40	10

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	45	0	-	0	44 32
Stage 1	-	-	-	-	32 -
Stage 2	-	-	-	-	12 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1563	-	-	-	967 1042
Stage 1	-	-	-	-	991 -
Stage 2	-	-	-	-	1011 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1563	-	-	-	965 1042
Mov Cap-2 Maneuver	-	-	-	-	965 -
Stage 1	-	-	-	-	989 -
Stage 2	-	-	-	-	1011 -

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1563	-	-	-	979
HCM Lane V/C Ratio	0.002	-	-	-	0.051
HCM Control Delay (s)	7.3	0	-	-	8.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection						
Int Delay, s/veh	3.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	5	1	34	49	33	8
Future Vol, veh/h	5	1	34	49	33	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	6	1	38	54	37	9

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	92	0	-	0	78 65
Stage 1	-	-	-	-	65 -
Stage 2	-	-	-	-	13 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1503	-	-	-	925 999
Stage 1	-	-	-	-	958 -
Stage 2	-	-	-	-	1010 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1503	-	-	-	921 999
Mov Cap-2 Maneuver	-	-	-	-	921 -
Stage 1	-	-	-	-	954 -
Stage 2	-	-	-	-	1010 -

Approach	EB	WB	SB
HCM Control Delay, s	6.2	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1503	-	-	-	935
HCM Lane V/C Ratio	0.004	-	-	-	0.049
HCM Control Delay (s)	7.4	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Queueing and Blocking Reports

Queuing and Blocking Report
AM Existing

06/20/2019

Intersection: 100: US 17 (Market Street) & Middle Sound Loop Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	L	L	T	R	L	T	T	R	L
Maximum Queue (ft)	90	818	300	371	380	242	200	116	352	408	53	149
Average Queue (ft)	31	776	298	189	209	58	73	64	209	181	15	81
95th Queue (ft)	75	952	304	293	306	147	144	113	337	331	41	162
Link Distance (ft)		803				1698			1485	1485		
Upstream Blk Time (%)		68										
Queuing Penalty (veh)		237										
Storage Bay Dist (ft)	150		275	425	425		150	350			900	150
Storage Blk Time (%)			94				1		0			2
Queuing Penalty (veh)			113				5		0			10

Intersection: 100: US 17 (Market Street) & Middle Sound Loop Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	359	360	225
Average Queue (ft)	268	252	70
95th Queue (ft)	396	391	224
Link Distance (ft)	339	339	
Upstream Blk Time (%)	4	3	
Queuing Penalty (veh)	30	23	
Storage Bay Dist (ft)			125
Storage Blk Time (%)	21	21	
Queuing Penalty (veh)	19	10	

Intersection: 200: US 17 (Market Street) & Lendire Access Road

Movement	EB	NB	SB	SB
Directions Served	LR	L	T	TR
Maximum Queue (ft)	53	50	239	220
Average Queue (ft)	10	4	47	43
95th Queue (ft)	35	22	162	157
Link Distance (ft)	642		1447	1447
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		100		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 300: Middle Sound Loop Road/Lendire Road & Lendire Access Road

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	459	1446
Average Queue (ft)	216	908
95th Queue (ft)	480	1753
Link Distance (ft)	642	1412
Upstream Blk Time (%)		26
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 449

Intersection: 2: Middle Sound Loop Road

Movement

Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 100: US 17 (Market Street) & Middle Sound Loop Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	R	R	L	L	T	R	L	T	T	R
Maximum Queue (ft)	197	146	268	212	396	409	250	200	350	503	442	76
Average Queue (ft)	111	66	130	118	199	225	68	79	155	286	277	16
95th Queue (ft)	182	127	205	183	319	330	153	162	334	444	433	52
Link Distance (ft)		284	284				1698			1473	1473	
Upstream Blk Time (%)			0									
Queuing Penalty (veh)			0									
Storage Bay Dist (ft)	150			125	425	425		150	350			900
Storage Blk Time (%)	6	1	11	6		0	0	3	0	5		
Queuing Penalty (veh)	4	2	17	9		0	2	19	1	6		

Intersection: 100: US 17 (Market Street) & Middle Sound Loop Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	149	364	369	275
Average Queue (ft)	111	323	325	59
95th Queue (ft)	180	386	393	220
Link Distance (ft)		332	332	
Upstream Blk Time (%)		17	16	
Queuing Penalty (veh)		135	128	
Storage Bay Dist (ft)	150			175
Storage Blk Time (%)	11	34	33	
Queuing Penalty (veh)	75	32	16	

Intersection: 200: US 17 (Market Street) & Lendire Access Road

Movement	EB	SB	SB
Directions Served	R	T	TR
Maximum Queue (ft)	30	422	390
Average Queue (ft)	5	155	144
95th Queue (ft)	21	352	339
Link Distance (ft)	644	1415	1415
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 300: Middle Sound Loop Road/Lendire Road & Lendire Access Road

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	49	53
Average Queue (ft)	19	2
95th Queue (ft)	40	17
Link Distance (ft)	644	1426
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 446

Intersection: 2: Middle Sound Loop Road

Movement

Directions Served
 Maximum Queue (ft)
 Average Queue (ft)
 95th Queue (ft)
 Link Distance (ft)
 Upstream Blk Time (%)
 Queuing Penalty (veh)
 Storage Bay Dist (ft)
 Storage Blk Time (%)
 Queuing Penalty (veh)

Intersection: 100: US 17 (Market Street) & Middle Sound Loop Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	R	R	L	L	T	R	L	T	T	R
Maximum Queue (ft)	199	280	214	209	327	330	348	191	349	442	466	63
Average Queue (ft)	122	63	124	118	184	214	81	93	133	269	258	16
95th Queue (ft)	182	165	191	187	302	324	194	174	242	374	374	43
Link Distance (ft)		288	288				1698			1472	1472	
Upstream Blk Time (%)		0										
Queuing Penalty (veh)		0										
Storage Bay Dist (ft)	150			125	425	425		150	350			900
Storage Blk Time (%)	5	1	10	8				5	0	1		
Queuing Penalty (veh)	3	1	14	12				26	0	2		

Intersection: 100: US 17 (Market Street) & Middle Sound Loop Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	149	374	369	275
Average Queue (ft)	108	334	331	46
95th Queue (ft)	172	391	408	196
Link Distance (ft)		335	335	
Upstream Blk Time (%)		16	11	
Queuing Penalty (veh)		131	90	
Storage Bay Dist (ft)	150			175
Storage Blk Time (%)	7	34	32	
Queuing Penalty (veh)	47	34	15	

Intersection: 200: US 17 (Market Street) & Lendire Access Road

Movement	EB	SB	SB
Directions Served	R	T	TR
Maximum Queue (ft)	116	351	275
Average Queue (ft)	37	131	113
95th Queue (ft)	85	270	244
Link Distance (ft)	523	1411	1411
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 300: Middle Sound Loop Road/Lendire Road & Lendire Access Road

Movement	WB
Directions Served	LR
Maximum Queue (ft)	27
Average Queue (ft)	15
95th Queue (ft)	37
Link Distance (ft)	87
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 400: Lendire Road & Site Access 1

Movement	SB
Directions Served	LR
Maximum Queue (ft)	67
Average Queue (ft)	26
95th Queue (ft)	47
Link Distance (ft)	979
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 500: Lendire Access Road & Site Access 2

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	29	31
Average Queue (ft)	1	24
95th Queue (ft)	10	45
Link Distance (ft)	87	1204
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 377

Intersection: 2: Middle Sound Loop Road

Movement

Directions Served
 Maximum Queue (ft)
 Average Queue (ft)
 95th Queue (ft)
 Link Distance (ft)
 Upstream Blk Time (%)
 Queuing Penalty (veh)
 Storage Bay Dist (ft)
 Storage Blk Time (%)
 Queuing Penalty (veh)

Intersection: 100: US 17 (Market Street) & Middle Sound Loop Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	R	R	L	L	T	R	L	T	T	R
Maximum Queue (ft)	199	238	277	222	392	426	235	200	349	479	435	84
Average Queue (ft)	133	73	143	121	191	219	86	94	176	268	257	18
95th Queue (ft)	203	166	225	198	296	345	176	178	308	400	383	46
Link Distance (ft)		288	288				1698			1472	1472	
Upstream Blk Time (%)			0									
Queuing Penalty (veh)			0									
Storage Bay Dist (ft)	150			125	425	425		150	350			900
Storage Blk Time (%)	11	1	20	14		0	2	3	0	2		
Queuing Penalty (veh)	7	1	29	20		1	13	15	0	3		

Intersection: 100: US 17 (Market Street) & Middle Sound Loop Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	150	355	386	275
Average Queue (ft)	113	319	317	57
95th Queue (ft)	175	401	414	219
Link Distance (ft)		335	335	
Upstream Blk Time (%)		10	7	
Queuing Penalty (veh)		83	59	
Storage Bay Dist (ft)	150			175
Storage Blk Time (%)	4	31	27	
Queuing Penalty (veh)	28	31	13	

Intersection: 200: US 17 (Market Street) & Lendire Access Road

Movement	EB	SB	SB
Directions Served	R	T	T
Maximum Queue (ft)	76	245	224
Average Queue (ft)	26	88	67
95th Queue (ft)	56	207	188
Link Distance (ft)	510	1410	1410
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			3
Queuing Penalty (veh)			1

Intersection: 300: Middle Sound Loop Road/Lendire Road & Lendire Access Road

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	51	44
Average Queue (ft)	23	1
95th Queue (ft)	43	15
Link Distance (ft)	87	477
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 400: Lendire Road & Site Access 1

Movement	SB
Directions Served	LR
Maximum Queue (ft)	73
Average Queue (ft)	27
95th Queue (ft)	47
Link Distance (ft)	972
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 500: Lendire Access Road & Site Access 2

Movement	SB
Directions Served	LR
Maximum Queue (ft)	78
Average Queue (ft)	25
95th Queue (ft)	53
Link Distance (ft)	1204
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 305

Queuing and Blocking Report
PM Existing

06/20/2019

Intersection: 100: US 17 (Market Street) & Middle Sound Loop Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	L	L	T	R	L	T	T	R	L
Maximum Queue (ft)	200	472	300	341	323	358	200	349	719	713	153	150
Average Queue (ft)	134	160	184	181	193	147	120	152	345	334	35	132
95th Queue (ft)	230	358	311	282	285	322	214	292	755	760	102	170
Link Distance (ft)		800				1698			1484	1484		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	150		275	425	425		150	350			900	150
Storage Blk Time (%)	24	14	1				14	15	0	15		34
Queuing Penalty (veh)	50	28	1				54	54	0	22		217

Intersection: 100: US 17 (Market Street) & Middle Sound Loop Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	362	385	225
Average Queue (ft)	254	249	14
95th Queue (ft)	484	486	82
Link Distance (ft)	339	339	
Upstream Blk Time (%)	14	8	
Queuing Penalty (veh)	106	58	
Storage Bay Dist (ft)			125
Storage Blk Time (%)	24	17	
Queuing Penalty (veh)	26	11	

Intersection: 200: US 17 (Market Street) & Lendire Access Road

Movement	EB	NB	SB	SB
Directions Served	LR	L	T	TR
Maximum Queue (ft)	31	31	474	464
Average Queue (ft)	3	4	110	91
95th Queue (ft)	18	20	336	306
Link Distance (ft)	642		1447	1447
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		100		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 300: Middle Sound Loop Road/Lendire Road & Lendire Access Road

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	49	30
Average Queue (ft)	23	1
95th Queue (ft)	41	10
Link Distance (ft)	642	1477
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 627

Intersection: 2: Middle Sound Loop Road

Movement	SE
Directions Served	T
Maximum Queue (ft)	20
Average Queue (ft)	1
95th Queue (ft)	6
Link Distance (ft)	464
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 100: US 17 (Market Street) & Middle Sound Loop Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	R	R	L	L	T	R	L	T	T	R
Maximum Queue (ft)	200	322	228	214	356	370	345	200	350	1508	1508	975
Average Queue (ft)	155	151	100	84	188	209	108	118	311	927	911	329
95th Queue (ft)	220	289	180	165	310	318	248	193	424	1452	1447	1028
Link Distance (ft)		291	291				1698			1474	1474	
Upstream Blk Time (%)		2								2	3	
Queuing Penalty (veh)		3								0	0	
Storage Bay Dist (ft)	150			125	425	425		150	350			900
Storage Blk Time (%)	28	22	11	5			6	15	28	33	15	
Queuing Penalty (veh)	27	23	7	3			25	55	251	58	52	

Intersection: 100: US 17 (Market Street) & Middle Sound Loop Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	150	357	364	275
Average Queue (ft)	140	307	295	45
95th Queue (ft)	165	439	428	196
Link Distance (ft)		332	332	
Upstream Blk Time (%)		25	13	
Queuing Penalty (veh)		191	95	
Storage Bay Dist (ft)	150			175
Storage Blk Time (%)	53	22	25	
Queuing Penalty (veh)	350	25	16	

Intersection: 200: US 17 (Market Street) & Lendire Access Road

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	685	657
Average Queue (ft)	229	208
95th Queue (ft)	533	526
Link Distance (ft)	1415	1415
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 300: Middle Sound Loop Road/Lendire Road & Lendire Access Road

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	49	22	54
Average Queue (ft)	20	1	2
95th Queue (ft)	45	7	18
Link Distance (ft)	644	464	1426
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 1182

Intersection: 5: Middle Sound Loop Road

Movement	SE
Directions Served	T
Maximum Queue (ft)	502
Average Queue (ft)	114
95th Queue (ft)	367
Link Distance (ft)	495
Upstream Blk Time (%)	1
Queuing Penalty (veh)	2
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 100: US 17 (Market Street) & Middle Sound Loop Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	R	R	L	L	T	R	L	T	T	R
Maximum Queue (ft)	200	301	272	218	302	318	329	200	350	1515	1524	975
Average Queue (ft)	155	220	91	75	179	194	164	137	336	1321	1310	787
95th Queue (ft)	249	363	185	158	300	305	294	225	405	1859	1871	1404
Link Distance (ft)		286	286				1698			1472	1472	
Upstream Blk Time (%)		23	0							39	39	
Queuing Penalty (veh)		44	0							0	0	
Storage Bay Dist (ft)	150			125	425	425		150	350			900
Storage Blk Time (%)	38	30	14	7			16	9	42	56	51	
Queuing Penalty (veh)	38	43	10	5			67	37	386	122	172	

Intersection: 100: US 17 (Market Street) & Middle Sound Loop Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	150	352	375	275
Average Queue (ft)	134	270	256	19
95th Queue (ft)	165	456	479	101
Link Distance (ft)		334	334	
Upstream Blk Time (%)		21	14	
Queuing Penalty (veh)		161	112	
Storage Bay Dist (ft)	150			175
Storage Blk Time (%)	38	25	26	
Queuing Penalty (veh)	255	29	16	

Intersection: 200: US 17 (Market Street) & Lendire Access Road

Movement	EB	SB	SB
Directions Served	R	T	TR
Maximum Queue (ft)	53	496	484
Average Queue (ft)	24	170	143
95th Queue (ft)	53	440	397
Link Distance (ft)	533	1412	1412
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 300: Middle Sound Loop Road/Lendire Road & Lendire Access Road

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	49	24
Average Queue (ft)	25	1
95th Queue (ft)	45	8
Link Distance (ft)	78	467
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 400: Lendire Road & Site Access 1

Movement	SB
Directions Served	LR
Maximum Queue (ft)	48
Average Queue (ft)	17
95th Queue (ft)	43
Link Distance (ft)	986
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 500: Lendire Access Road & Site Access 2

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	31	54
Average Queue (ft)	1	26
95th Queue (ft)	10	49
Link Distance (ft)	78	1121
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1499

Intersection: 5: Middle Sound Loop Road

Movement	SE
Directions Served	T
Maximum Queue (ft)	514
Average Queue (ft)	407
95th Queue (ft)	598
Link Distance (ft)	495
Upstream Blk Time (%)	16
Queuing Penalty (veh)	43
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 100: US 17 (Market Street) & Middle Sound Loop Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	R	R	L	L	T	R	L	T	T	R
Maximum Queue (ft)	200	355	267	223	332	346	465	200	350	1541	1517	975
Average Queue (ft)	175	325	128	116	197	214	198	146	330	1500	1497	947
95th Queue (ft)	254	364	223	198	298	319	394	237	409	1519	1510	1193
Link Distance (ft)		287	287				1698			1478	1478	
Upstream Blk Time (%)		75	0							65	63	
Queuing Penalty (veh)		142	0							0	0	
Storage Bay Dist (ft)	150			125	425	425		150	350			900
Storage Blk Time (%)	63	56	35	27			18	24	56	64	72	
Queuing Penalty (veh)	62	80	24	19			73	92	513	141	244	

Intersection: 100: US 17 (Market Street) & Middle Sound Loop Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	150	350	366	275
Average Queue (ft)	133	270	260	33
95th Queue (ft)	168	472	479	168
Link Distance (ft)		334	334	
Upstream Blk Time (%)		23	15	
Queuing Penalty (veh)		177	118	
Storage Bay Dist (ft)	150			175
Storage Blk Time (%)	39	24	26	
Queuing Penalty (veh)	264	27	17	

Intersection: 200: US 17 (Market Street) & Lendire Access Road

Movement	EB	SB	SB	SB
Directions Served	R	T	T	R
Maximum Queue (ft)	93	665	562	225
Average Queue (ft)	33	224	202	30
95th Queue (ft)	78	547	490	156
Link Distance (ft)	521	1411	1411	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				125
Storage Blk Time (%)			15	
Queuing Penalty (veh)			13	

Intersection: 300: Middle Sound Loop Road/Lendire Road & Lendire Access Road

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	92	310
Average Queue (ft)	34	54
95th Queue (ft)	67	184
Link Distance (ft)	78	467
Upstream Blk Time (%)	2	
Queuing Penalty (veh)	1	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 400: Lendire Road & Site Access 1

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	31	69
Average Queue (ft)	1	25
95th Queue (ft)	10	47
Link Distance (ft)	1083	978
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 500: Lendire Access Road & Site Access 2

Movement	SB
Directions Served	LR
Maximum Queue (ft)	54
Average Queue (ft)	25
95th Queue (ft)	51
Link Distance (ft)	1121
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 2050

Traffic Volume Data

US 17 (Market Street) at SR 1403 (Middle Sound Loop Road)								
AM Peak	2019 TMC	Balancing	2019 Existing	2021 Projected	Approved Development	2021 FNB	Site Trips	2021 Full Build
EBL	73		73	74	49	123	40	163
EBT	47		47	48	11	59	4	63
EBR	248		248	253	38	291	4	295
WBL	484		484	494	0	494		494
WBT	68		68	69	11	80	5	85
WBR	121		121	123	0	123		123
NBL	84		84	86	40	133	20	153
NBT	1163		1163	1186	0	1179		1179
NBR	131		131	134	0	134		134
SBL	93		93	95	0	95	4	99
SBT	1375		1375	1403	0	1403	31	1434
SBR	47		47	48	0	48		48
Total	3934	0	3934	4013	149	4162	108	4270

US 17 (Market Street) at SR 1403 (Middle Sound Loop Road)								
PM Peak	2019 TMC	Balancing	2019 Existing	2021 Projected	Approved Development	2021 FNB	Site Trips	2021 Full Build
EBL	84		84	86	21	107	37	144
EBT	87		87	89	5	94	4	98
EBR	118		118	120	16	136	4	140
WBL	285		285	291	0	291		291
WBT	77		77	79	5	84	11	95
WBR	117		117	119	0	119		119
NBL	148		148	151	16	176	43	219
NBT	1789		1789	1825	0	1816		1816
NBR	333		333	340	0	340		340
SBL	109		109	111	0	111	4	115
SBT	1297		1297	1323	0	1323	29	1352
SBR	63		63	64	0	64		64
Total	4507	0	4507	4598	63	4661	132	4793

US 17 (Market Street) at Lendire Access Road								
AM Peak	2019 TMC	Balancing	2019 Existing	2021 Projected	Approved Development	2021 FNB	Site Trips	2021 Full Build
EBL	0		0	0		0		0
EBT	0		0	0		0		0
EBR	5		5	5		5	36	41
WBL	0		0	0		0		0
WBT	0		0	0		0		0
WBR	0		0	0		0		0
NBL	7		7	7		7		7
NBT	0	1350	1350	1377	49	1426	40	1466
NBR	0		0	0		0		0
SBL	0		0	0		0		0
SBT	0	1510	1510	1540	51	1591		1591
SBR	17		17	17		17	23	40
Total	29	2860	2889	2946	100	3039	99	3138

US 17 (Market Street) at Lendire Access Road								
PM Peak	2019 TMC	Balancing	2019 Existing	2021 Projected	Approved Development	2021 FNB	Site Trips	2021 Full Build
EBL	0		0	0		0		0
EBT	0		0	0		0		0
EBR	1		1	1		1	33	34
WBL	0		0	0		0		0
WBT	0		0	0		0		0
WBR	0		0	0		0		0
NBL	9		9	9		9		9
NBT	0	1981	1981	2021	21	2042	37	2079
NBR	0		0	0		0		0
SBL	0		0	0		0		0
SBT	0	1468	1468	1498	21	1519		1519
SBR	33		33	34		34	49	83
Total	43	3449	3492	3562	42	3596	119	3715

SR 2892 (Lendire Road) at Lendire Access Road								
AM Peak	2019 TMC	Balancing	2019 Existing	2021 Projected	Approved Development	2021 FNB	Site Trips	2021 Full Build
EBL	0		0	0		0		0
EBT	0		0	0		0		0
EBR	0		0	0		0		0
WBL	14		14	14		14	9	23
WBT	0		0	0		0		0
WBR	23		23	23		23	16	39
NBL	0		0	0		0		0
NBT	80		80	82	11	100	23	123
NBR	19		19	19		19	3	22
SBL	15		15	15		15		15
SBT	335		335	342	11	353	40	393
SBR	0		0	0		0		0
Total	486	0	486	495	22	517	75	592

SR 2892 (Lendire Road) at Lendire Access Road								
PM Peak	2019 TMC	Balancing	2019 Existing	2021 Projected	Approved Development	2021 FNB	Site Trips	2021 Full Build
EBL	0		0	0		0		0
EBT	0		0	0		0		0
EBR	0		0	0		0		0
WBL	22		22	22		22	8	30
WBT	0		0	0		0		0
WBR	29		29	30		29	21	50
NBL	0		0	0		0		0
NBT	284		284	290	5	304	49	353
NBR	9		9	9		9	5	14
SBL	7		7	7		7		7
SBT	187		187	191	5	196	37	233
SBR	0		0	0		0		0
Total	538	0	538	549	10	559	99	658

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Ph:(336)744-1636

Counted by: L. Bounds File Name : 190231 US 17 (Market St) @ SR 1403 (Middle Sound Loop Rd)
Site Code : 00190231
Start Date : 4/24/2019
Weather: Clear Page No : 1

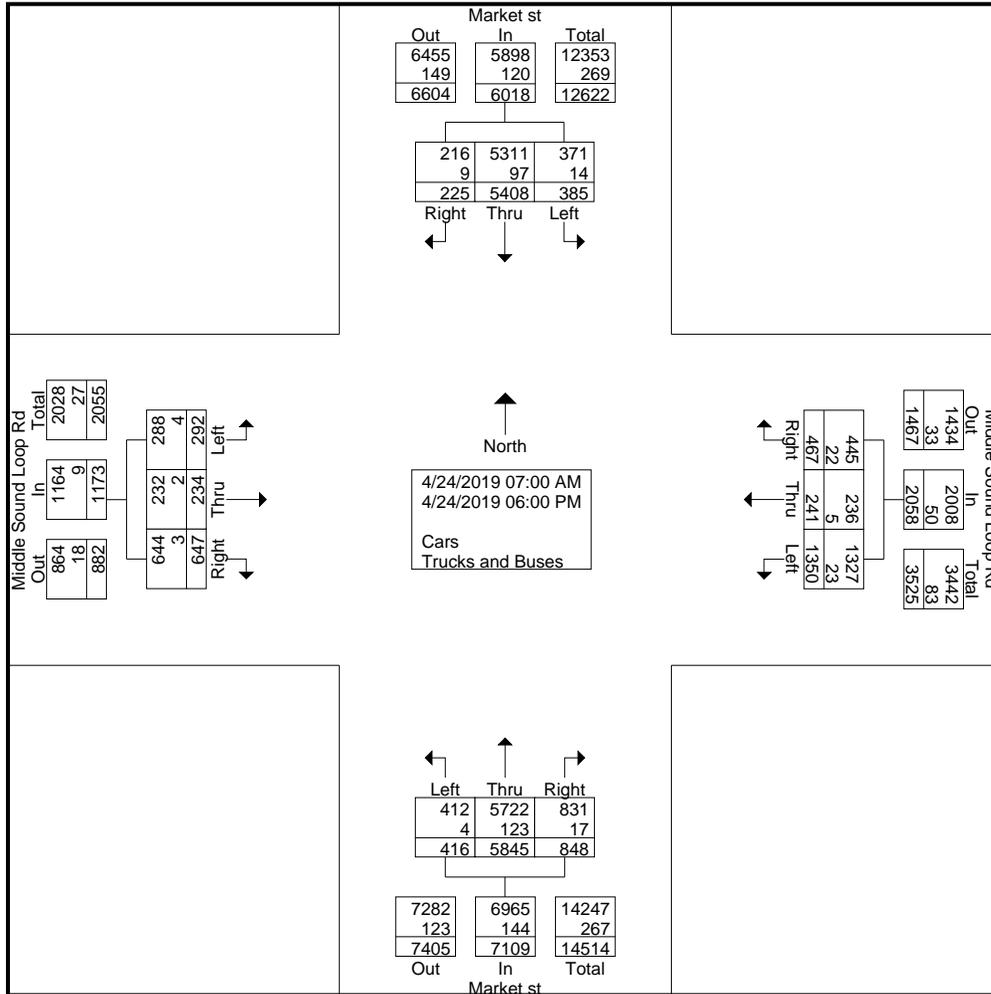
Groups Printed- Cars - Trucks and Buses

Start Time	Market st Southbound				Middle Sound Loop Rd Westbound				Market st Northbound				Middle Sound Loop Rd Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
07:00 AM	14	458	37	509	18	9	85	112	24	217	17	258	46	4	9	59	938
07:15 AM	9	298	28	335	37	15	135	187	33	297	12	342	63	6	27	96	960
07:30 AM	14	442	33	489	36	15	100	151	29	312	27	368	69	9	13	91	1099
07:45 AM	9	253	12	274	23	21	137	181	22	267	23	312	51	16	16	83	850
Total	46	1451	110	1607	114	60	457	631	108	1093	79	1280	229	35	65	329	3847
08:00 AM	15	382	20	417	25	17	112	154	47	287	22	356	65	16	17	98	1025
08:15 AM	15	345	14	374	28	9	82	119	49	312	26	387	54	4	20	78	958
08:30 AM	17	362	9	388	36	10	107	153	42	316	8	366	49	17	31	97	1004
08:45 AM	15	356	11	382	24	3	58	85	36	269	22	327	38	6	14	58	852
Total	62	1445	54	1561	113	39	359	511	174	1184	78	1436	206	43	82	331	3839
*** BREAK ***																	
04:00 PM	9	394	36	439	31	12	48	91	70	448	26	544	31	14	13	58	1132
04:15 PM	12	248	30	290	30	22	70	122	47	439	31	517	28	13	10	51	980
04:30 PM	16	300	28	344	28	17	63	108	41	445	24	510	14	18	23	55	1017
04:45 PM	17	273	18	308	34	14	68	116	75	447	30	552	21	24	15	60	1036
Total	54	1215	112	1381	123	65	249	437	233	1779	111	2123	94	69	61	224	4165
05:00 PM	19	384	29	432	32	16	85	133	74	540	36	650	36	16	20	72	1287
05:15 PM	20	277	18	315	34	22	77	133	52	372	37	461	18	29	15	62	971
05:30 PM	12	340	36	388	24	19	68	111	66	515	38	619	28	18	31	77	1195
05:45 PM	12	296	26	334	27	20	55	102	141	362	37	540	36	24	18	78	1054
Total	63	1297	109	1469	117	77	285	479	333	1789	148	2270	118	87	84	289	4507
*** BREAK ***																	
Grand Total	225	5408	385	6018	467	241	1350	2058	848	5845	416	7109	647	234	292	1173	16358
Apprch %	3.7	89.9	6.4		22.7	11.7	65.6		11.9	82.2	5.9		55.2	19.9	24.9		
Total %	1.4	33.1	2.4	36.8	2.9	1.5	8.3	12.6	5.2	35.7	2.5	43.5	4	1.4	1.8	7.2	
Cars	216	5311	371	5898	445	236	1327	2008	831	5722	412	6965	644	232	288	1164	16035
% Cars	96	98.2	96.4	98	95.3	97.9	98.3	97.6	98	97.9	99	98	99.5	99.1	98.6	99.2	98
Trucks and Buses	9	97	14	120	22	5	23	50	17	123	4	144	3	2	4	9	323
% Trucks and Buses	4	1.8	3.6	2	4.7	2.1	1.7	2.4	2	2.1	1	2	0.5	0.9	1.4	0.8	2

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File Name : 190231 US 17 (Market St) @ SR 1403 (Middle Sound Loop Rd)
 Site Code : 00190231
 Start Date : 4/24/2019
 Page No : 2

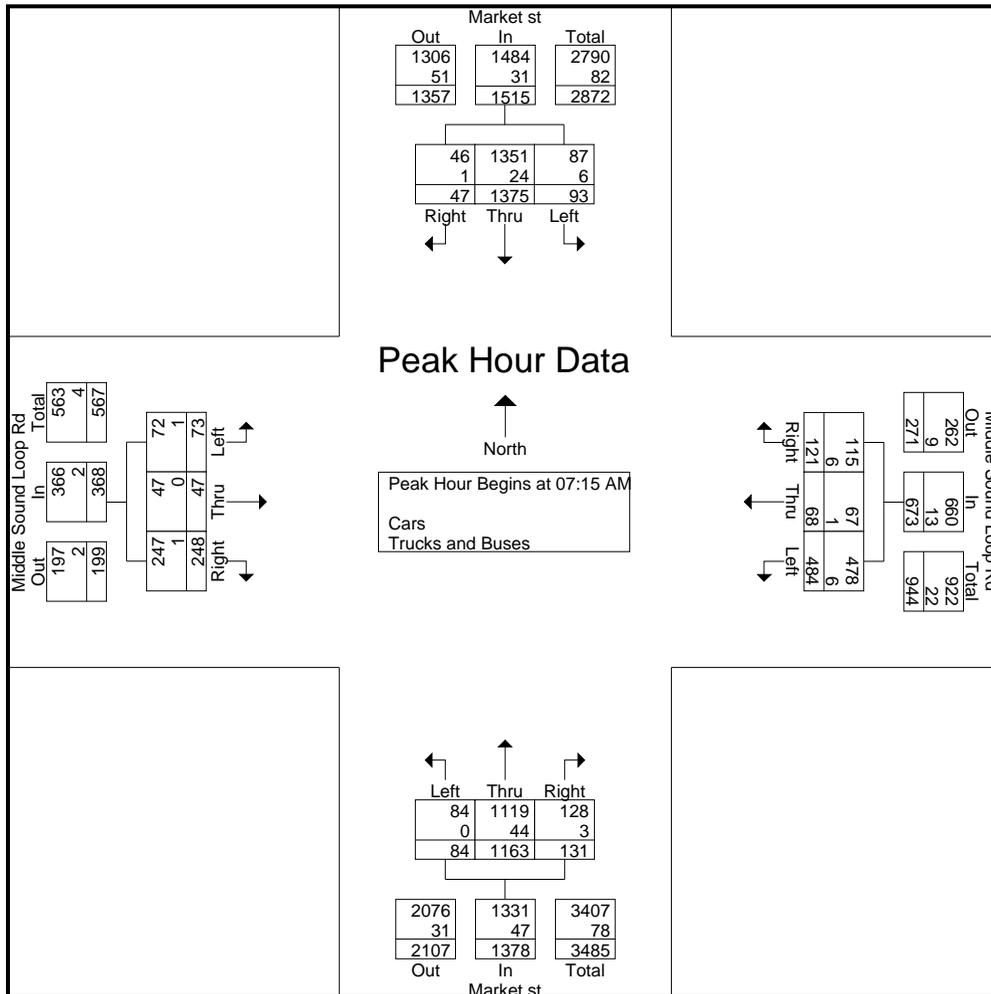


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File Name : 190231 US 17 (Market St) @ SR 1403 (Middle Sound Loop Rd)
Site Code : 00190231
Start Date : 4/24/2019
Page No : 3

Start Time	Market st Southbound				Middle Sound Loop Rd Westbound				Market st Northbound				Middle Sound Loop Rd Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	9	298	28	335	37	15	135	187	33	297	12	342	63	6	27	96	960
07:30 AM	14	442	33	489	36	15	100	151	29	312	27	368	69	9	13	91	1099
07:45 AM	9	253	12	274	23	21	137	181	22	267	23	312	51	16	16	83	850
08:00 AM	15	382	20	417	25	17	112	154	47	287	22	356	65	16	17	98	1025
Total Volume	47	1375	93	1515	121	68	484	673	131	1163	84	1378	248	47	73	368	3934
% App. Total	3.1	90.8	6.1		18	10.1	71.9		9.5	84.4	6.1		67.4	12.8	19.8		
PHF	.783	.778	.705	.775	.818	.810	.883	.900	.697	.932	.778	.936	.899	.734	.676	.939	.895
Cars	46	1351	87	1484	115	67	478	660	128	1119	84	1331	247	47	72	366	3841
% Cars	97.9	98.3	93.5	98.0	95.0	98.5	98.8	98.1	97.7	96.2	100	96.6	99.6	100	98.6	99.5	97.6
Trucks and Buses	1	24	6	31	6	1	6	13	3	44	0	47	1	0	1	2	93
% Trucks and Buses	2.1	1.7	6.5	2.0	5.0	1.5	1.2	1.9	2.3	3.8	0	3.4	0.4	0	1.4	0.5	2.4



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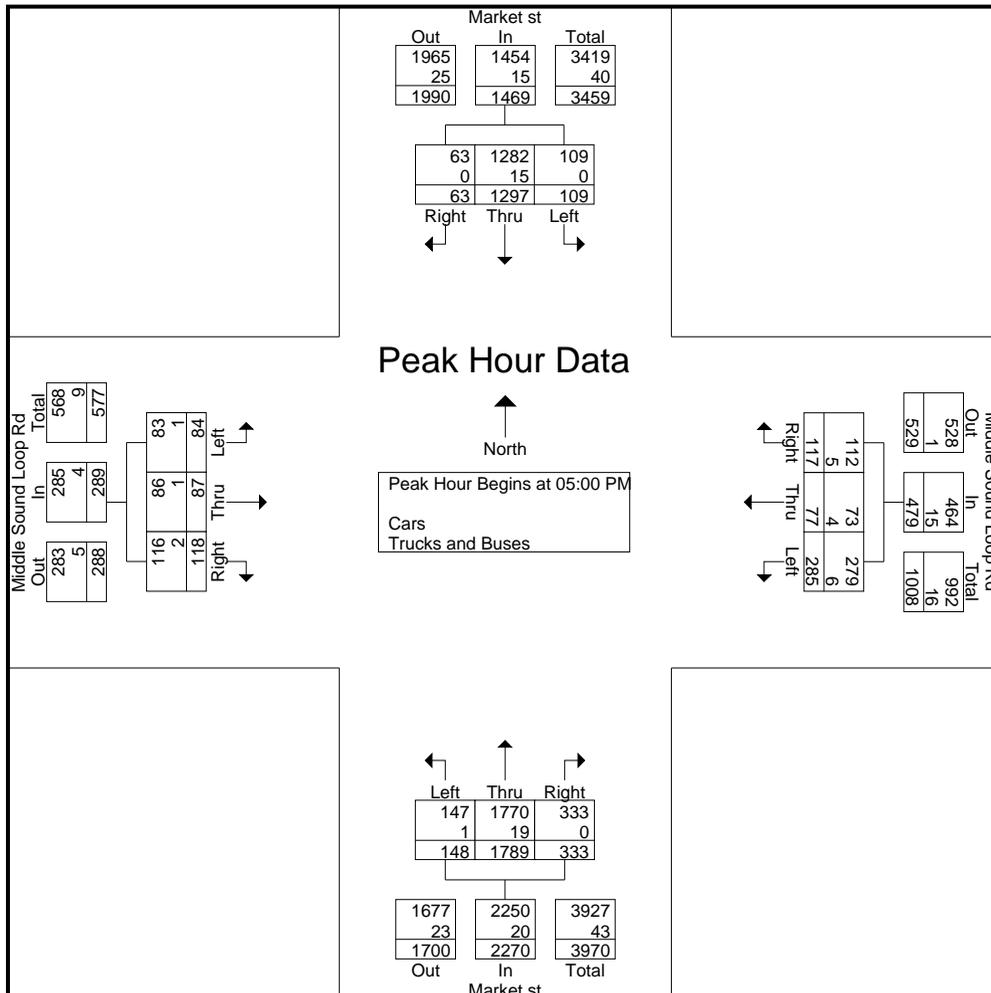
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File Name : 190231 US 17 (Market St) @ SR 1403 (Middle Sound Loop Rd)
 Site Code : 00190231
 Start Date : 4/24/2019
 Page No : 4

Start Time	Market st Southbound				Middle Sound Loop Rd Westbound				Market st Northbound				Middle Sound Loop Rd Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	

Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 05:00 PM

05:00 PM	19	384	29	432	32	16	85	133	74	540	36	650	36	16	20	72	1287
05:15 PM	20	277	18	315	34	22	77	133	52	372	37	461	18	29	15	62	971
05:30 PM	12	340	36	388	24	19	68	111	66	515	38	619	28	18	31	77	1195
05:45 PM	12	296	26	334	27	20	55	102	141	362	37	540	36	24	18	78	1054
Total Volume	63	1297	109	1469	117	77	285	479	333	1789	148	2270	118	87	84	289	4507
% App. Total	4.3	88.3	7.4		24.4	16.1	59.5		14.7	78.8	6.5		40.8	30.1	29.1		
PHF	.788	.844	.757	.850	.860	.875	.838	.900	.590	.828	.974	.873	.819	.750	.677	.926	.875
Cars	63	1282	109	1454	112	73	279	464	333	1770	147	2250	116	86	83	285	4453
% Cars	100	98.8	100	99.0	95.7	94.8	97.9	96.9	100	98.9	99.3	99.1	98.3	98.9	98.8	98.6	98.8
Trucks and Buses	0	15	0	15	5	4	6	15	0	19	1	20	2	1	1	4	54
% Trucks and Buses	0	1.2	0	1.0	4.3	5.2	2.1	3.1	0	1.1	0.7	0.9	1.7	1.1	1.2	1.4	1.2



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Counted by: R. Steiss
*U-Turns under peds column
in bicycle category
Weather: Clear

File Name : 190231 US 17 (Market St) @ Lendire Access Road
Site Code : 00190231
Start Date : 4/24/2019
Page No : 1

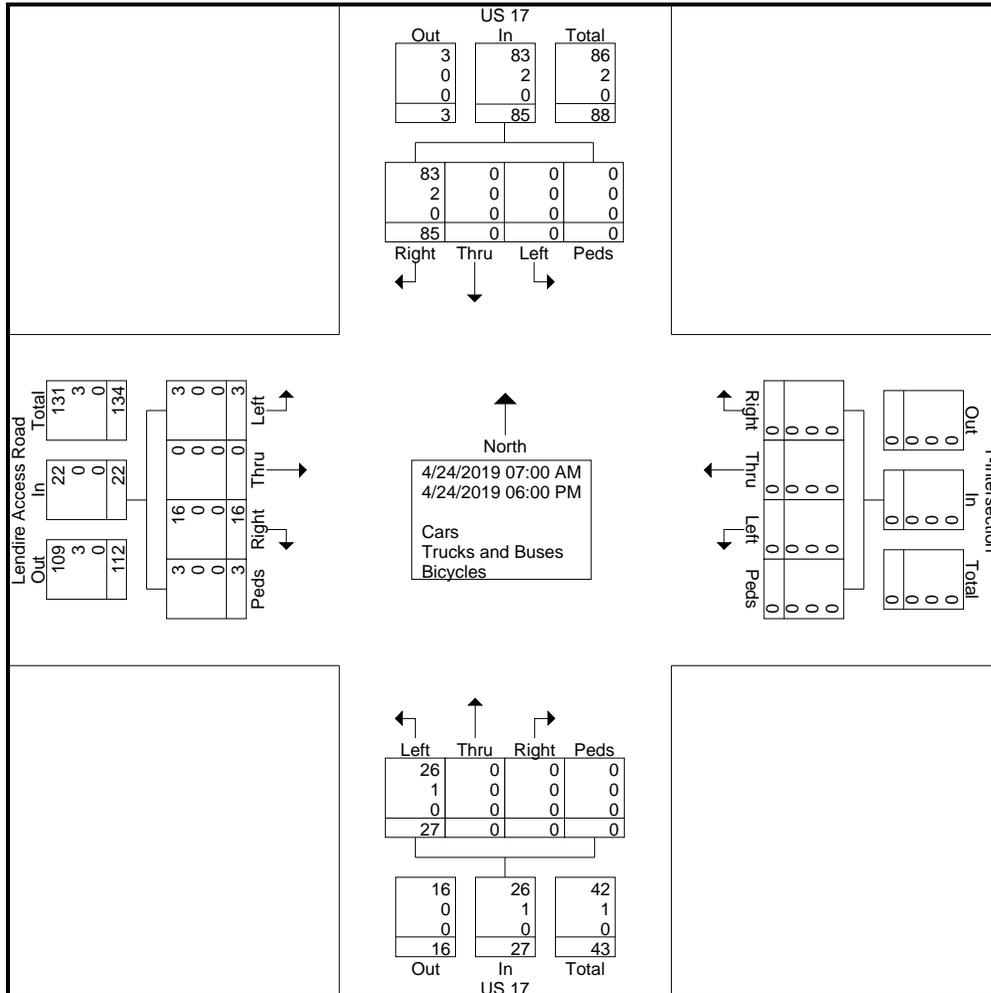
Groups Printed- Cars - Trucks and Buses - Bicycles

Start Time	US 17 Southbound					T-intersection Westbound					US 17 Northbound					Lendire Access Road Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	0	0	0	1	3
07:15 AM	5	0	0	0	5	0	0	0	0	0	0	0	3	0	3	2	0	0	0	2	10
07:30 AM	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	5
07:45 AM	3	0	0	0	3	0	0	0	0	0	0	0	3	0	3	2	0	0	1	3	9
Total	12	0	0	0	12	0	0	0	0	0	0	0	8	0	8	6	0	0	1	7	27
08:00 AM	5	0	0	0	5	0	0	0	0	0	0	0	1	0	1	0	0	0	1	1	7
08:15 AM	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	7
08:30 AM	2	0	0	0	2	0	0	0	0	0	0	0	2	0	2	3	0	0	0	3	7
08:45 AM	6	0	0	0	6	0	0	0	0	0	0	0	2	0	2	2	0	0	0	2	10
Total	18	0	0	0	18	0	0	0	0	0	0	0	5	0	5	6	0	1	1	8	31
*** BREAK ***																					
04:00 PM	5	0	0	0	5	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	7
04:15 PM	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	4
04:30 PM	3	0	0	0	3	0	0	0	0	0	0	0	2	0	2	1	0	0	0	1	6
04:45 PM	11	0	0	0	11	0	0	0	0	0	0	0	2	0	2	1	0	1	0	2	15
Total	22	0	0	0	22	0	0	0	0	0	0	0	5	0	5	3	0	2	0	5	32
05:00 PM	6	0	0	0	6	0	0	0	0	0	0	0	1	0	1	1	0	0	1	2	9
05:15 PM	11	0	0	0	11	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	13
05:30 PM	9	0	0	0	9	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	12
05:45 PM	7	0	0	0	7	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	10
Total	33	0	0	0	33	0	0	0	0	0	0	0	9	0	9	1	0	0	1	2	44
*** BREAK ***																					
Grand Total	85	0	0	0	85	0	0	0	0	0	0	0	27	0	27	16	0	3	3	22	134
Approch %	100	0	0	0		0	0	0	0		0	0	100	0		72.7	0	13.6	13.6		
Total %	63.4	0	0	0	63.4	0	0	0	0	0	0	0	20.1	0	20.1	11.9	0	2.2	2.2	16.4	
Cars	83	0	0	0	83	0	0	0	0	0	0	0	26	0	26	16	0	3	3	22	131
% Cars	97.6	0	0	0	97.6	0	0	0	0	0	0	0	96.3	0	96.3	100	0	100	100	100	97.8
Trucks and Buses																					
% Trucks and Buses	2.4	0	0	0	2.4	0	0	0	0	0	0	0	3.7	0	3.7	0	0	0	0	0	2.2
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DAVENPORT

119 Brookstown Ave., Suite PH1,
 Winston Salem NC, 27101
 Ph:(336)744-1636

File Name : 190231 US 17 (Market St) @ Lendire Access Road
 Site Code : 00190231
 Start Date : 4/24/2019
 Page No : 2

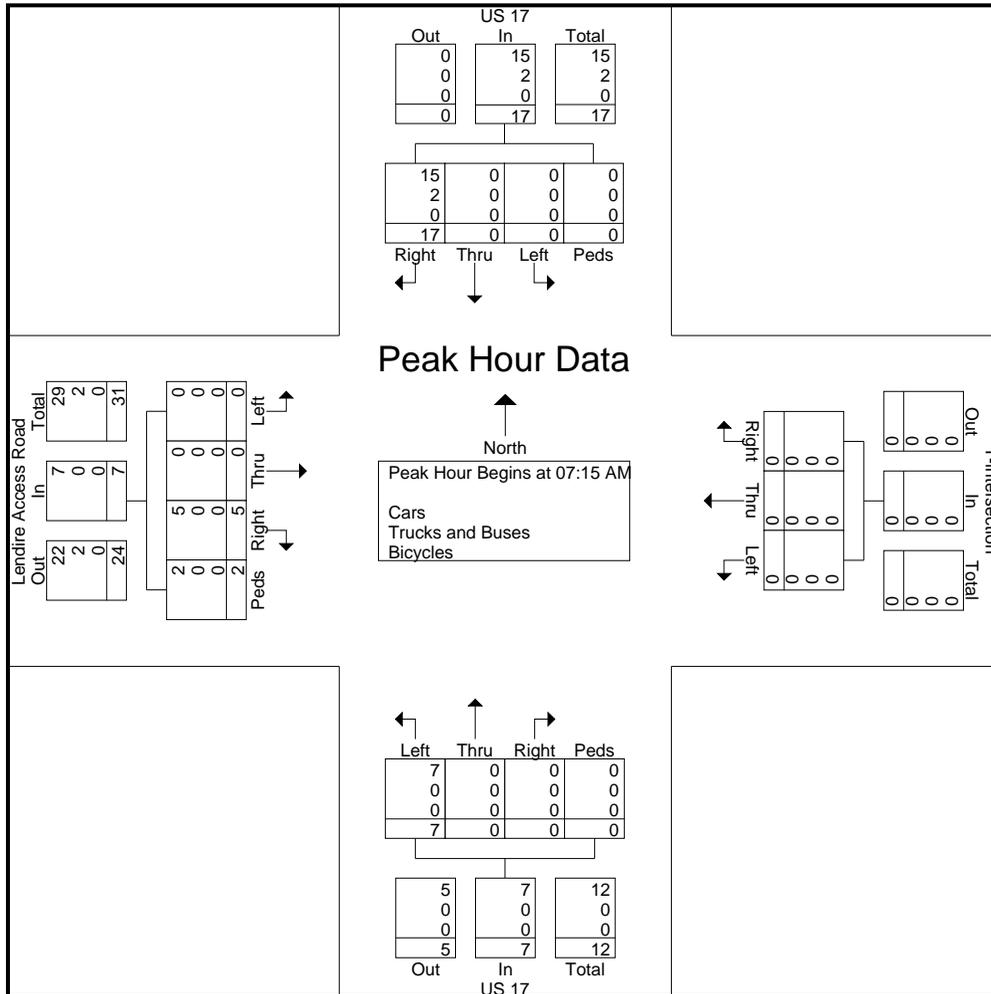


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119 Brookstown Ave., Suite PH1,
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File Name : 190231 US 17 (Market St) @ Lendire Access Road
Site Code : 00190231
Start Date : 4/24/2019
Page No : 3

Start Time	US 17 Southbound					T-intersection Westbound				US 17 Northbound					Lendire Access Road Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 07:15 AM																				
07:15 AM	5	0	0	0	5	0	0	0	0	0	0	3	0	3	2	0	0	0	2	10
07:30 AM	4	0	0	0	4	0	0	0	0	0	0	0	0	0	1	0	0	0	1	5
07:45 AM	3	0	0	0	3	0	0	0	0	0	0	3	0	3	2	0	0	0	1	3
08:00 AM	5	0	0	0	5	0	0	0	0	0	0	1	0	1	0	0	0	1	1	7
Total Volume	17	0	0	0	17	0	0	0	0	0	0	7	0	7	5	0	0	2	7	31
% App. Total	100	0	0	0		0	0	0		0	0	100	0		71.4	0	0	28.6		
PHF	.850	.000	.000	.000	.850	.000	.000	.000	.000	.000	.000	.583	.000	.583	.625	.000	.000	.500	.583	.775
Cars	15	0	0	0	15	0	0	0	0	0	0	7	0	7	5	0	0	2	7	29
% Cars	88.2	0	0	0	88.2	0	0	0	0	0	0	100	0	100	100	0	0	100	100	93.5
Trucks and Buses	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
% Trucks and Buses	11.8	0	0	0	11.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.5
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

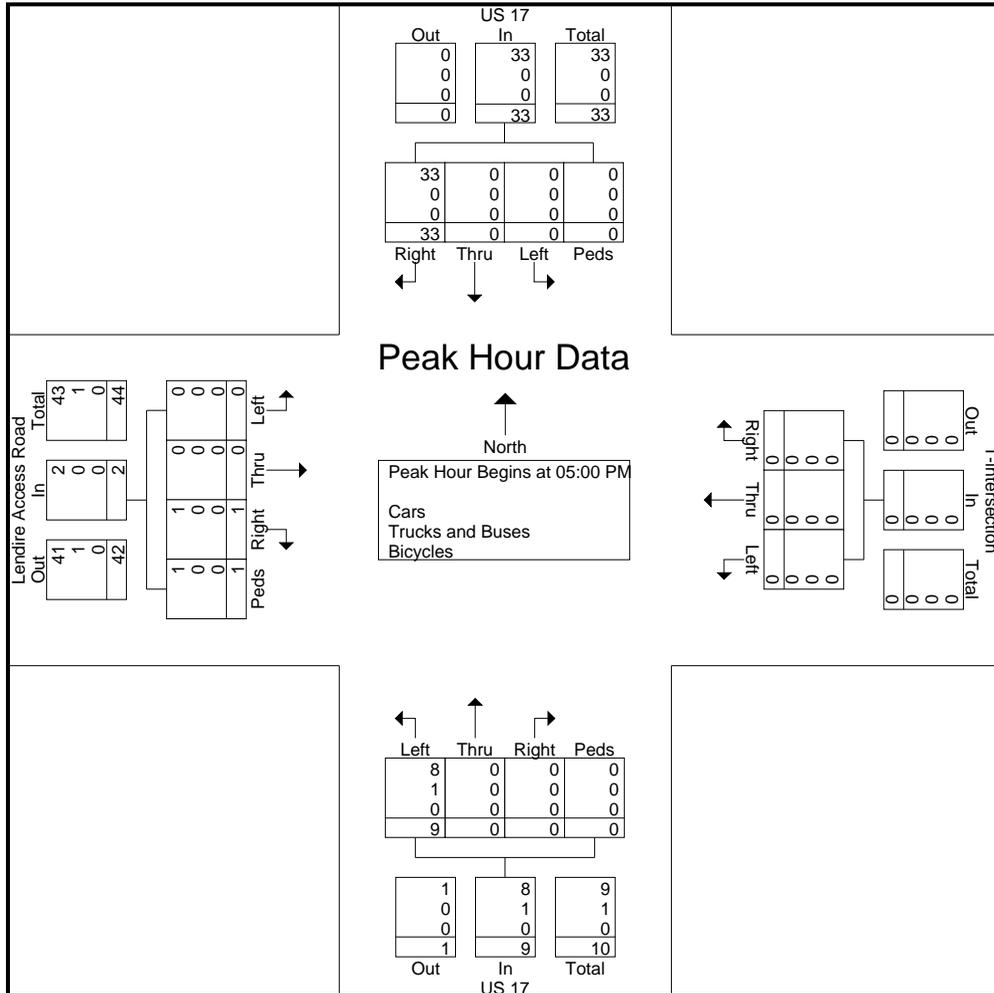


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119 Brookstown Ave., Suite PH1,
Winston Salem NC, 27101
Ph:(336)744-1636

File Name : 190231 US 17 (Market St) @ Lendire Access Road
Site Code : 00190231
Start Date : 4/24/2019
Page No : 4

Start Time	US 17 Southbound					T-intersection Westbound				US 17 Northbound					Lendire Access Road Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 05:00 PM																				
05:00 PM	6	0	0	0	6	0	0	0	0	0	0	1	0	1	1	0	0	1	2	9
05:15 PM	11	0	0	0	11	0	0	0	0	0	0	2	0	2	0	0	0	0	0	13
05:30 PM	9	0	0	0	9	0	0	0	0	0	0	3	0	3	0	0	0	0	0	12
05:45 PM	7	0	0	0	7	0	0	0	0	0	0	3	0	3	0	0	0	0	0	10
Total Volume	33	0	0	0	33	0	0	0	0	0	0	9	0	9	1	0	0	1	2	44
% App. Total	100	0	0	0		0	0	0		0	0	100	0		50	0	0	50		
PHF	.750	.000	.000	.000	.750	.000	.000	.000	.000	.000	.000	.750	.000	.750	.250	.000	.000	.250	.250	.846
Cars	33	0	0	0	33	0	0	0	0	0	0	8	0	8	1	0	0	1	2	43
% Cars	100	0	0	0	100	0	0	0	0	0	0	88.9	0	88.9	100	0	0	100	100	97.7
Trucks and Buses	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
% Trucks and Buses	0	0	0	0	0	0	0	0	0	0	0	11.1	0	11.1	0	0	0	0	0	2.3
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



DAVENPORT

119 Brookstown Ave., Suite PH1,
Winston Salem NC, 27101
Ph:(336)744-1636

DAVENPORT

305 West 4th Street, Winston Salem NC, 27101

Ph: (336) 744-1636

Counted by: L. Bounds

File Name : 190231 SR 2892(Lendire Rd) @ Lendire Access Rd

Site Code : 00190231

Start Date : 4/25/2019

Weather: Clear

Page No : 1

Groups Printed- Cars - Trucks and Buses

Start Time	Lendire Road Southbound				Lendire Access Road Westbound				Middle Sound Loop Rd. Northbound				Eastbound	Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	App. Total	
07:00 AM	0	62	1	63	3	0	1	4	2	11	0	13	0	80
07:15 AM	0	82	3	85	9	0	4	13	3	15	0	18	0	116
07:30 AM	0	92	4	96	4	0	2	6	4	18	0	22	0	124
07:45 AM	0	91	5	96	4	0	5	9	7	23	0	30	0	135
Total	0	327	13	340	20	0	12	32	16	67	0	83	0	455
08:00 AM	0	70	3	73	6	0	3	9	5	24	0	29	0	111
08:15 AM	0	64	1	65	6	0	7	13	7	23	0	30	0	108
08:30 AM	0	50	3	53	5	0	2	7	5	22	0	27	0	87
08:45 AM	0	63	2	65	7	0	4	11	1	32	0	33	0	109
Total	0	247	9	256	24	0	16	40	18	101	0	119	0	415
*** BREAK ***														
04:00 PM	0	47	2	49	13	0	5	18	4	41	0	45	0	112
04:15 PM	0	33	1	34	5	0	2	7	0	39	0	39	0	80
04:30 PM	0	49	1	50	6	0	4	10	1	47	0	48	0	108
04:45 PM	0	57	1	58	10	0	4	14	1	45	0	46	0	118
Total	0	186	5	191	34	0	15	49	6	172	0	178	0	418
05:00 PM	0	51	1	52	4	0	6	10	4	69	0	73	0	135
05:15 PM	0	31	3	34	10	0	5	15	2	64	0	66	0	115
05:30 PM	0	60	2	62	11	0	11	22	3	100	0	103	0	187
05:45 PM	0	45	1	46	4	0	0	4	0	51	0	51	0	101
Total	0	187	7	194	29	0	22	51	9	284	0	293	0	538
*** BREAK ***														
Grand Total	0	947	34	981	107	0	65	172	49	624	0	673	0	1826
Apprch %	0	96.5	3.5		62.2	0	37.8		7.3	92.7	0		0	
Total %	0	51.9	1.9	53.7	5.9	0	3.6	9.4	2.7	34.2	0	36.9	0	
Cars	0	924	34	958	100	0	63	163	48	604	0	652	0	1773
% Cars	0	97.6	100	97.7	93.5	0	96.9	94.8	98	96.8	0	96.9	0	97.1
Trucks and Buses	0	23	0	23	7	0	2	9	1	20	0	21	0	53
% Trucks and Buses	0	2.4	0	2.3	6.5	0	3.1	5.2	2	3.2	0	3.1	0	2.9

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305 West 4th Street, Winston Salem NC, 27101

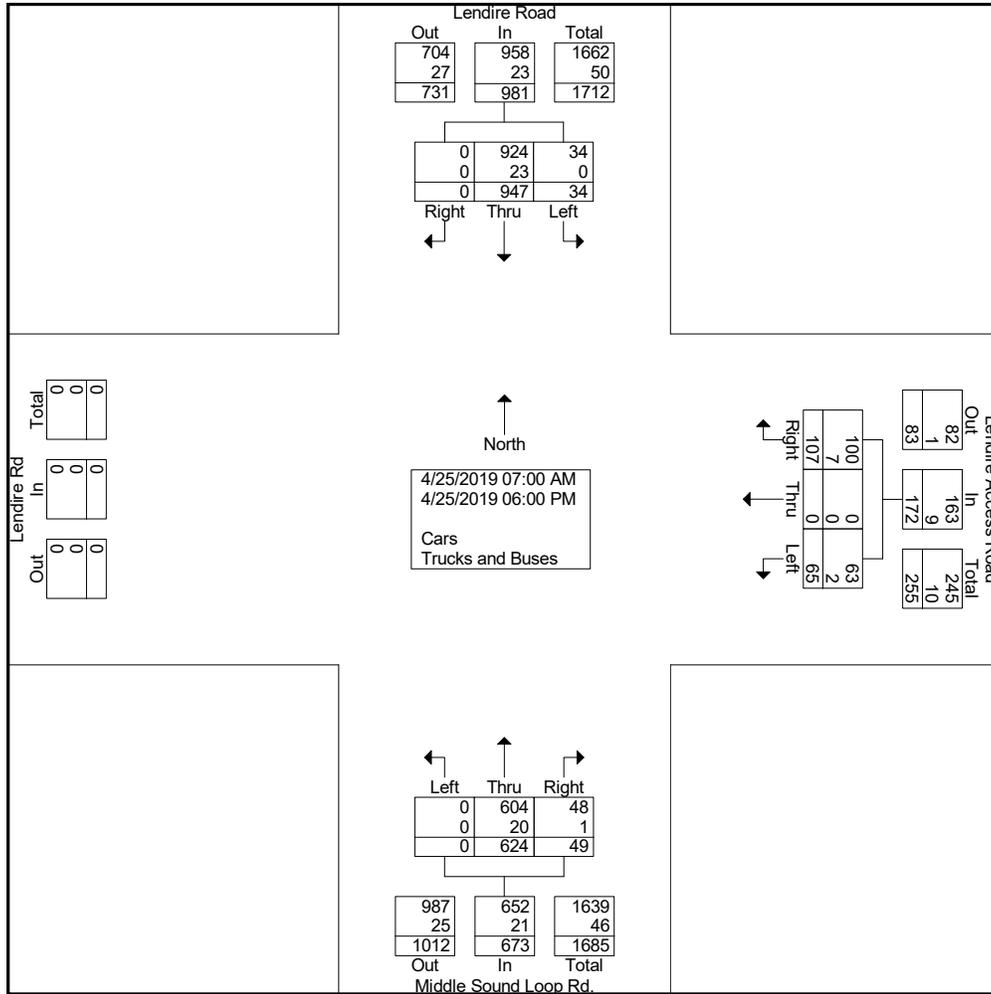
Ph: (336) 744-1636

File Name : 190231 SR 2892(Lendire Rd) @ Lendire Access Rd

Site Code : 00190231

Start Date : 4/25/2019

Page No : 2



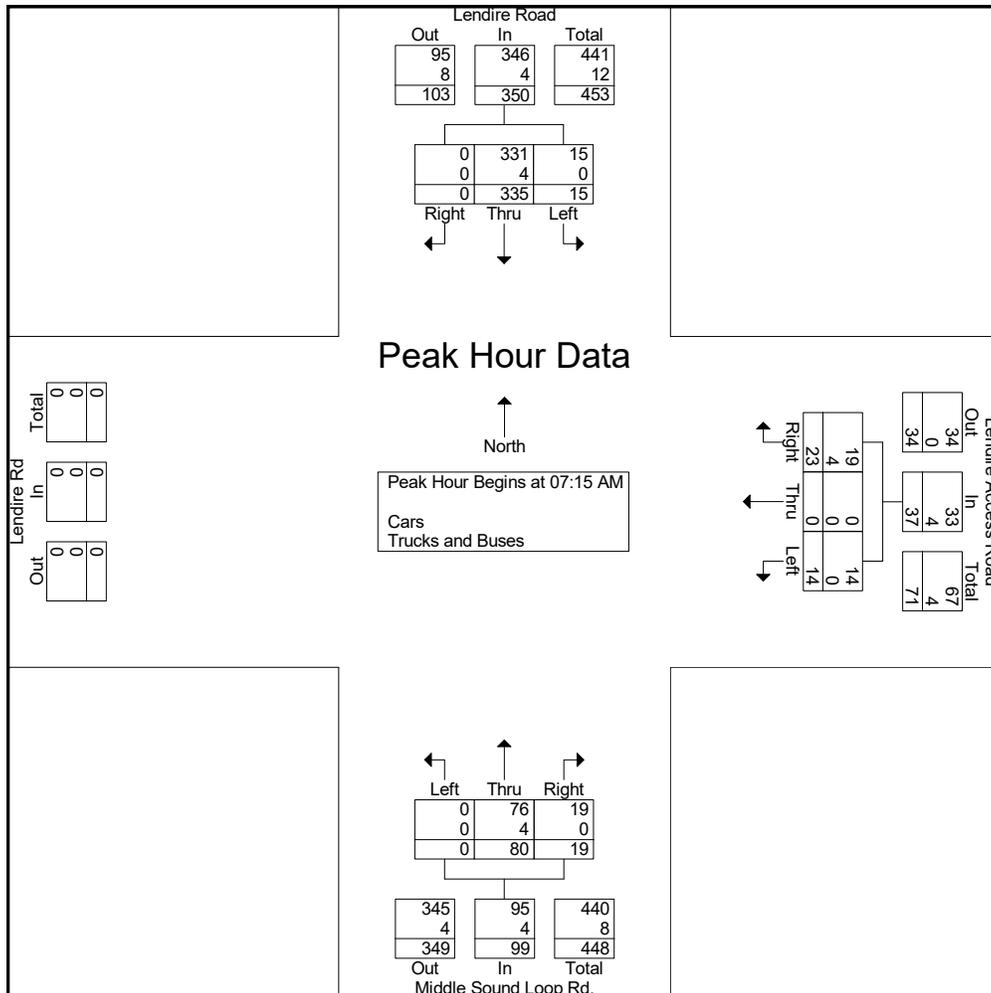
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305 West 4th Street, Winston Salem NC, 27101

Ph: (336) 744-1636

File Name : 190231 SR 2892(Lendire Rd) @ Lendire Access Rd
 Site Code : 00190231
 Start Date : 4/25/2019
 Page No : 3

Start Time	Lendire Road Southbound				Lendire Access Road Westbound				Middle Sound Loop Rd. Northbound				Eastbound		
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	App. Total	Int. Total	
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1															
Peak Hour for Entire Intersection Begins at 07:15 AM															
07:15 AM	0	82	3	85	9	0	4	13	3	15	0	18	0	116	
07:30 AM	0	92	4	96	4	0	2	6	4	18	0	22	0	124	
07:45 AM	0	91	5	96	4	0	5	9	7	23	0	30	0	135	
08:00 AM	0	70	3	73	6	0	3	9	5	24	0	29	0	111	
Total Volume	0	335	15	350	23	0	14	37	19	80	0	99	0	486	
% App. Total	0	95.7	4.3		62.2	0	37.8		19.2	80.8	0				
PHF	.000	.910	.750	.911	.639	.000	.700	.712	.679	.833	.000	.825	.000	.900	
Cars	0	331	15	346	19	0	14	33	19	76	0	95	0	474	
% Cars	0	98.8	100	98.9	82.6	0	100	89.2	100	95.0	0	96.0	0	97.5	
Trucks and Buses	0	4	0	4	4	0	0	4	0	4	0	4	0	12	
% Trucks and Buses	0	1.2	0	1.1	17.4	0	0	10.8	0	5.0	0	4.0	0	2.5	



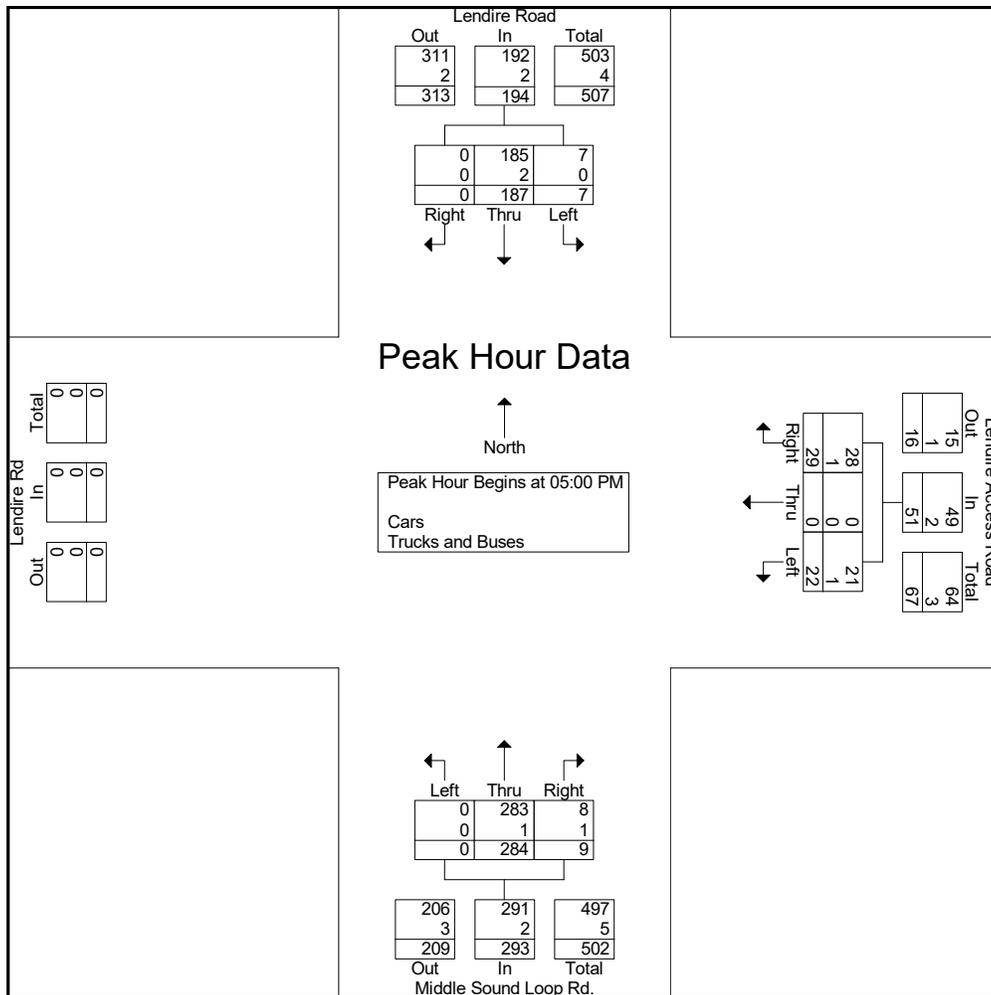
DAVENPORT

305 West 4th Street, Winston Salem NC, 27101

Ph: (336) 744-1636

File Name : 190231 SR 2892(Lendire Rd) @ Lendire Access Rd
 Site Code : 00190231
 Start Date : 4/25/2019
 Page No : 4

Start Time	Lendire Road Southbound				Lendire Access Road Westbound				Middle Sound Loop Rd. Northbound				Eastbound	Int. Total	
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	App. Total		
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1															
Peak Hour for Entire Intersection Begins at 05:00 PM															
05:00 PM	0	51	1	52	4	0	6	10	4	69	0	73	0	135	
05:15 PM	0	31	3	34	10	0	5	15	2	64	0	66	0	115	
05:30 PM	0	60	2	62	11	0	11	22	3	100	0	103	0	187	
05:45 PM	0	45	1	46	4	0	0	4	0	51	0	51	0	101	
Total Volume	0	187	7	194	29	0	22	51	9	284	0	293	0	538	
% App. Total	0	96.4	3.6		56.9	0	43.1		3.1	96.9	0				
PHF	.000	.779	.583	.782	.659	.000	.500	.580	.563	.710	.000	.711	.000	.719	
Cars	0	185	7	192	28	0	21	49	8	283	0	291	0	532	
% Cars	0	98.9	100	99.0	96.6	0	95.5	96.1	88.9	99.6	0	99.3	0	98.9	
Trucks and Buses	0	2	0	2	1	0	1	2	1	1	0	2	0	6	
% Trucks and Buses	0	1.1	0	1.0	3.4	0	4.5	3.9	11.1	0.4	0	0.7	0	1.1	



DAVENPORT

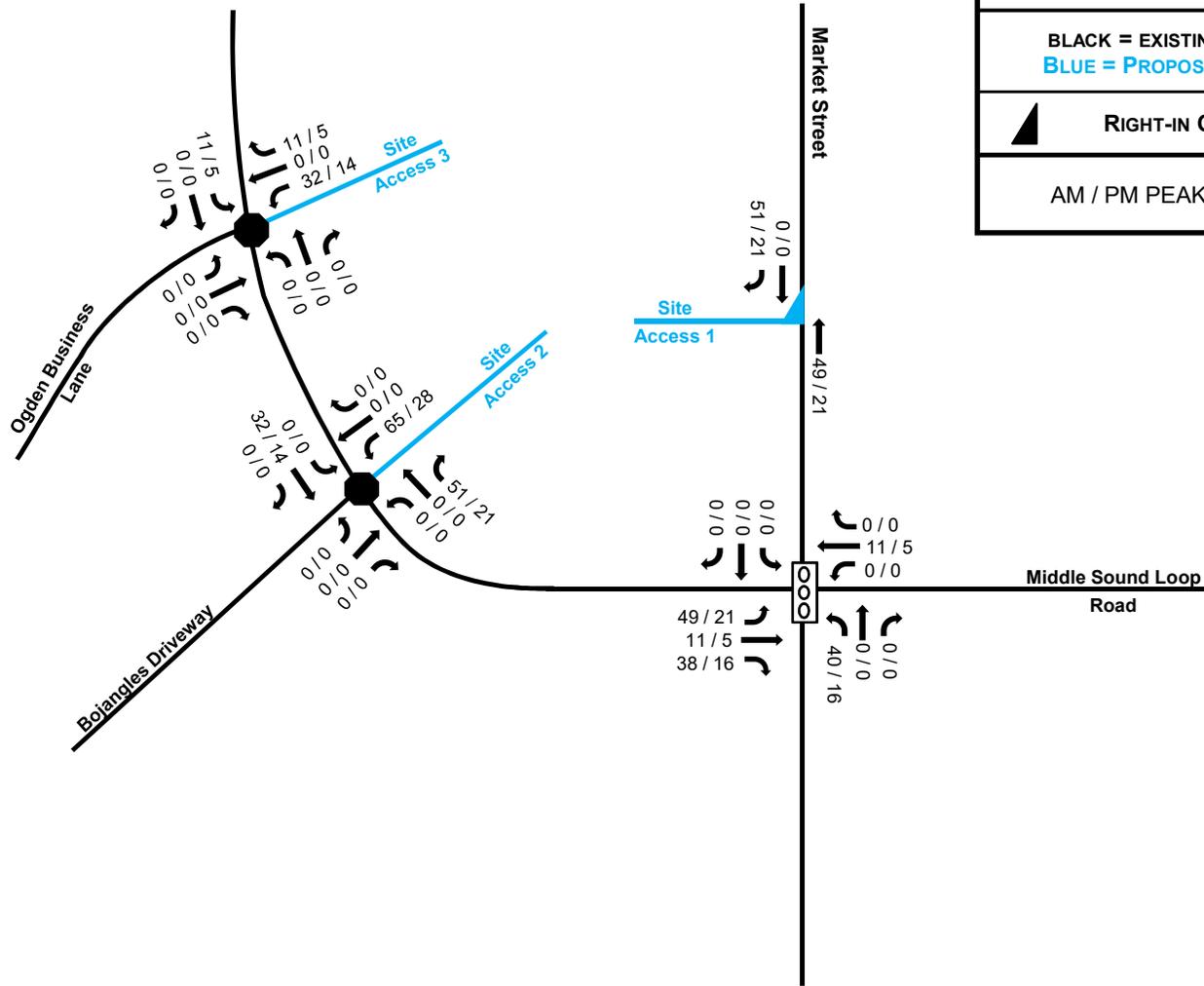
305 West 4th Street, Winston Salem NC, 27101

Ph: (336) 744-1636

Supporting Documentation



LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	ROADWAY
	TRAFFIC MOVEMENT
BLACK = EXISTING BLUE = PROPOSED	
	RIGHT-IN ONLY
	AM / PM PEAKS



**FIGURE A
APPROVED
DEVELOPMENT**

OGDEN STARBUCKS DEVELOPMENT
NEW HANOVER COUNTY, NC

PROJECT NUMBER 170257



This document, together with the concepts and designs presented herein, is intended only for the specific purpose and client for which it was prepared. Reuse of, or improper reliance on, this document by others without written authorization and adaptation by DAVENPORT shall be without liability to DAVENPORT and shall be a violation of the agreement between DAVENPORT and the client.

*** NOT TO SCALE ***



305 Chestnut Street
PO Box 1810
Wilmington, NC 28402
Ph: (910) 341-3258
Fax: (910) 341-7801
www.wmpo.org

May 10, 2018

Mr. Dan Cumbo, PE

Davenport Transportation Consulting
P.O. Box 15997
Wilmington, NC 28408

RE: Approval of the Traffic Impact Analysis (TIA) associated with the proposed
Ogden Starbucks Development
New Hanover County, NC

The WMPO, NCDOT, and City of Wilmington staffs have reviewed the **Ogden Starbucks Development** TIA, original TIA dated February 20, 2018 and Revised TIA, dated April 9, 2018. This development consists of:

- 2,200 SF Coffee/donut shop with drive thru

The Build out year is 2019.

Based on review of the analysis provided in the TIA report, the following improvements are required by the developer:

- Market Street and Middle Sound Loop Road
 - Provide an additional exclusive eastbound right-turn lane on Middle Sound Loop Road. Maximize the storage between the intersection with Market Street and the BoJangles driveway and provide a minimum taper. *(Note: This design and construction will need to be coordinated with the general contractor of the U-4751 NCDOT project on Market St.)*
 - Modify the signal to provide permitted + overlap phasing for the dual right-turn lanes.
- Middle Sound Loop Road at Bojangles Driveway/Site Access 2
 - The site access should be designed according to NCDOT standards.
 - Provide one ingress and one egress.
 - The driveway stem shown in the attached site plan is adequate.
- Middle Sound Loop Road at Ogden Business Lane/Site Access 3
 - The site access should be designed according to NCDOT standards.
 - Provide one ingress and one egress.
 - The driveway stem shown in the attached site plan is adequate.

Wilmington Urban Area Metropolitan Planning Organization

City of Wilmington • Town of Carolina Beach • Town of Kure Beach • Town of Wrightsville Beach
County of New Hanover • Town of Belville • Town of Leland • Town of Navassa • County of Brunswick
County of Pender • Cape Fear Public Transportation Authority • North Carolina Department of Transportation

-
- Market Street at Site Access 1
 - The site access should be designed according to NCDOT standards.
 - This access shall be constructed as a right-in only access.
 - Provide signage or vertical delineation as you enter the site access to inform customers to circle the building to access the drive-thru lane.
 - Extend the existing right-turn lane at the intersection of Market Street with Middle Sound Loop Road, to provide 100 feet storage at Site Access 1, with 50 feet of full-width deceleration and 100 feet taper.

If changes are made to the proposed site driveways and/or use, the current trip distribution may need to be modified and would require a revised Traffic Impact Analysis to be submitted for review by the NCDOT, WMPO, and City of Wilmington. This approval would become null and void.

The applicant is required to obtain all applicable City of Wilmington and NCDOT permits for access to the road network. A copy of this TIA approval shall be included with any NCDOT driveway permit application. All applicable NCDOT and City of Wilmington technical standards and policies shall apply.

Please contact me at 910-772-4170 with any questions regarding this approval.

Sincerely,



Fred Royal, PE, CFM

Project Engineer

Wilmington Metropolitan Planning Organization

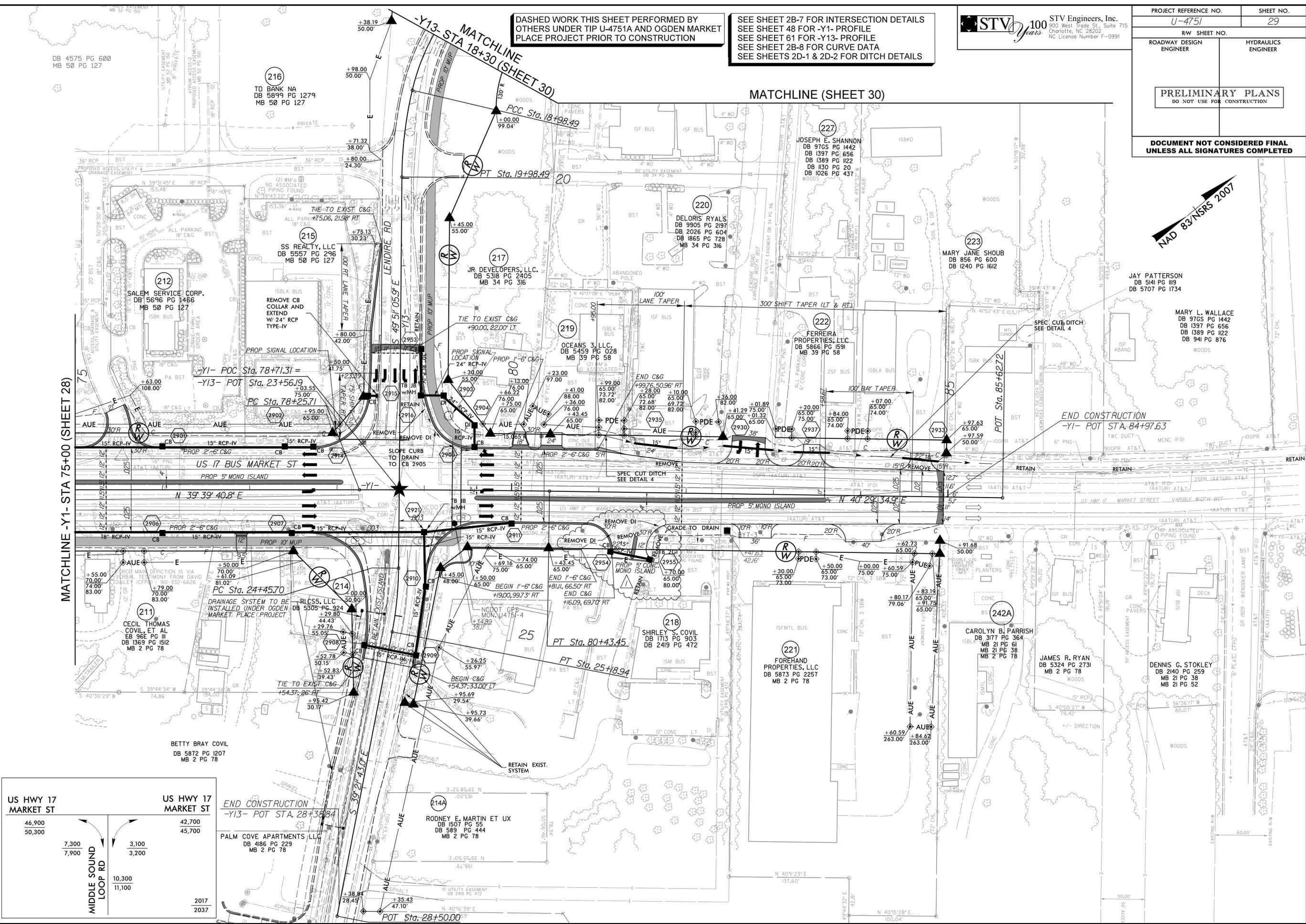
Cc: Ben Hughes, PE, District Engineer, NCDOT
Jessi Leonard, PE, Division Traffic Engineer, NCDOT
Jon Roan, Assistant District Engineer, NCDOT
Kirsten Spirakis, PE, Senior Assistant Division Engineer, NCDOT
Alex Stewart, PE, Senior Assistant Resident Engineer, NCDOT
Sam Burgess, Senior Planner, New Hanover County
Brad Shuler, Planner, New Hanover County
Bill McDow, Transportation Planner, WMPO
Mike Kozlosky, Executive Director, WMPO
Amy Kimes, PE, Senior Project Engineer, WMPO

attachment

PROJECT REFERENCE NO.	U-4751	SHEET NO.	29
RW SHEET NO.		ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

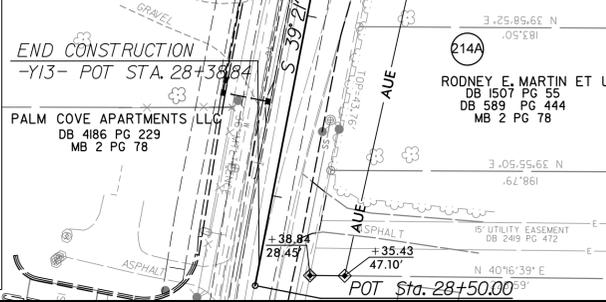
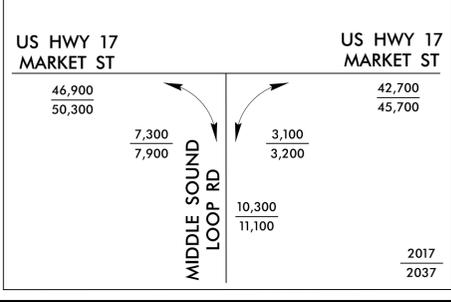
DASHED WORK THIS SHEET PERFORMED BY OTHERS UNDER TIP U-4751A AND OGDEN MARKET PLACE PROJECT PRIOR TO CONSTRUCTION

SEE SHEET 2B-7 FOR INTERSECTION DETAILS
 SEE SHEET 48 FOR -Y1- PROFILE
 SEE SHEET 61 FOR -Y13- PROFILE
 SEE SHEET 2B-8 FOR CURVE DATA
 SEE SHEETS 2D-1 & 2D-2 FOR DITCH DETAILS



REVISIONS
 2018-02-12 - ADDED DRAINAGE STRUCTURES TO DRIVEWAY.
 2018-09-19 - ADDED A SOUTHBOUND RIGHT TURN LANE ALONG -Y13- LENDIRE RD.

10/8/2018 Proj:\Projects\U4751.RDY_psh29.dgn



From: Dan Cumbo <dcumbo@davenportworld.com>
Sent: Monday, May 20, 2019 2:54 PM
To: Tou Lee <tlee@davenportworld.com>
Cc: Fredric Royal <Fredric.Royal@wilmingtonnc.gov>; Amy Kimes <Amy.Kimes@wilmingtonnc.gov>; Krupanidhi Koilada <KKoilada@davenportworld.com>; Ben Hughes <bthughes@ncdot.gov>
Subject: Re: Middlesound West Development - Lendire Road

Tou,

I spoke with Amy and Ben today about this matter, and the TIP year analysis will not be required.

Thanks

Dan Cumbo, PE | Senior Associate
DAVENPORT
910-251-8912 office
910-599-1380 mobile
dcumbo@davenportworld.com
Sent from my iPhone

On May 20, 2019, at 2:35 PM, Tou Lee <tlee@davenportworld.com> wrote:

Fred/Amy,

Per Brad's email below. The property has not been rezoned since the 1990s. The current zone is B-2.

As Dan mentioned earlier, it would seem that apartments and some office is a lot less intensive use compared to the large retail shopping centers proposed on this property in the past. Therefore, it doesn't seem like a TIP design year (2038) analysis would be necessary. Please advise whether you agree or would still require the TIP design year.

Thank you,

 **Tou Lee, EI** | Project Engineer
DAVENPORT
5200 77 Center Drive, Suite 325 | Charlotte, NC 28217
t (704) 200-2864 ext: 21612 | d (704) 579-5197
[website](#) | [map](#) | [email](#)

From: Schuler, Brad <bschuler@nhcgov.com>
Sent: Thursday, May 16, 2019 3:28 PM
To: Dan Cumbo <dcumbo@davenportworld.com>
Cc: Tou Lee <tlee@davenportworld.com>; Krupanidhi Koilada <KKoilada@davenportworld.com>; Fredric Royal <Fredric.Royal@wilmingtonnc.gov>; Amy Kimes <Amy.Kimes@wilmingtonnc.gov>
Subject: RE: Middlesound West Development - Lendire Road

Dan,

According to our records, the property was rezoned to the B-2 district in the late 1980s/early 1990s. Please let me know if you need the exact dates.

Thanks,
Brad

Brad Schuler | Senior Planner

Planning & Land Use - Planning & Zoning
New Hanover County
230 Government Center Drive, Suite 110
Wilmington, NC 28403
(910) 798-7444 p | (910) 798-7053 f
www.nhcgov.com

From: Dan Cumbo <dcumbo@davenportworld.com>

Sent: Wednesday, May 15, 2019 11:35 AM

To: Schuler, Brad <bschuler@nhcgov.com>

Cc: Tou Lee <tlee@davenportworld.com>; Krupanidhi Koilada <KKoilada@davenportworld.com>; Fredric Royal <Fredric.Royal@wilmingtonnc.gov>; Amy Kimes <Amy.Kimes@wilmingtonnc.gov>

Subject: Middlesound West Development - Lendire Road

Brad,

We understand that you are looking into this matter described below from the TIA scope approval letter:

- If the development has been rezoned from what was included in the TIP forecast, then the TIA must include a TIP design year (2038) analysis for the difference of the zoned use.

Can you give us an update on this?

It would seem that apartments and some office is a lot less intensive use compared to the large retail shopping centers proposed on this property in the past. Therefore, it doesn't seem like a TIP design year (2038) analysis would be necessary.

See below the current land uses and trip generation proposed for the project.
<image002.jpg>

Thanks,

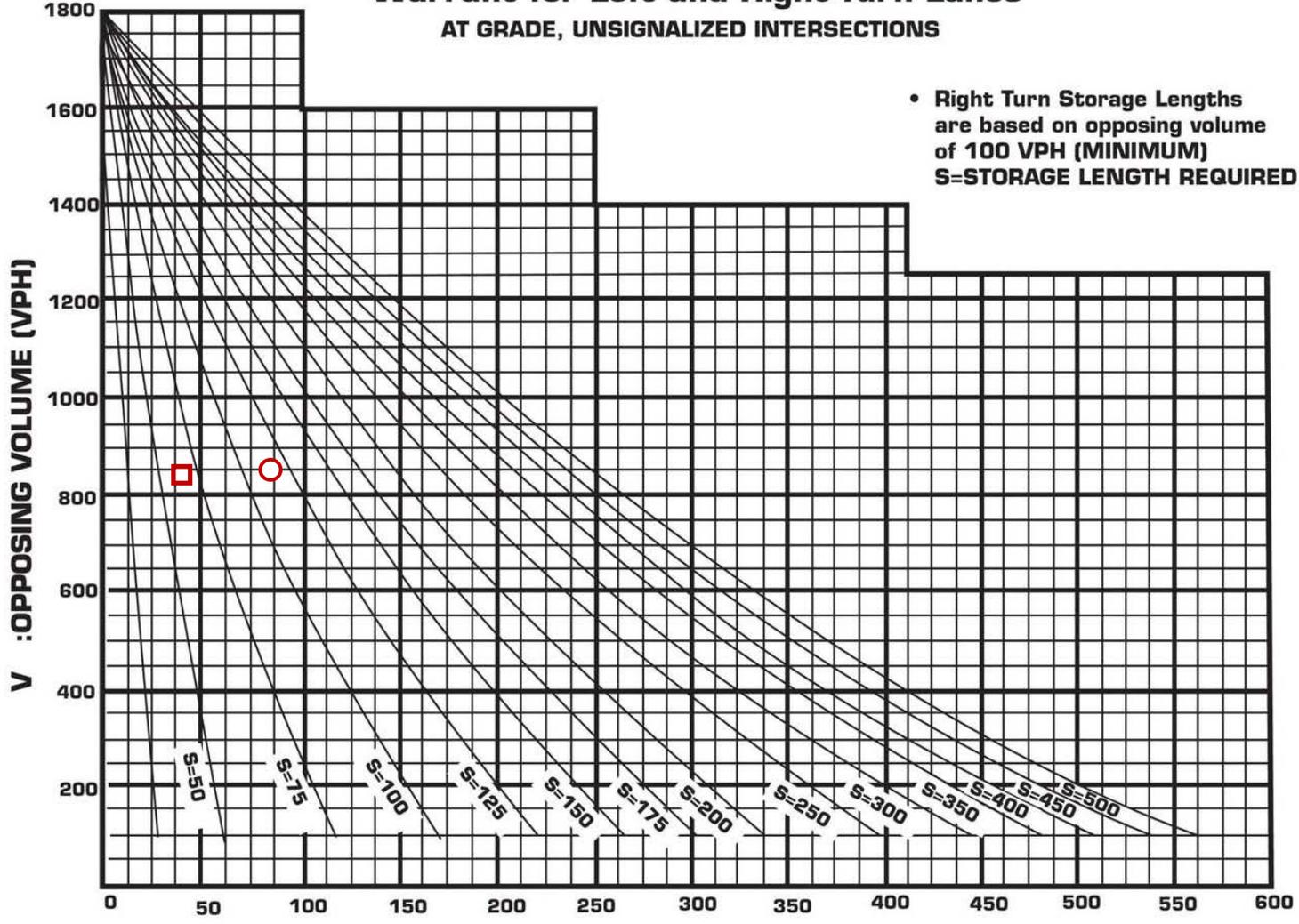
<image001.png>

Dan Cumbo, PE | Senior Associate
DAVENPORT
3722 Shipyard Boulevard, Suite E | Wilmington, NC 28403
t (910) 251-8912 ext: 22201 | c (910) 599-1380 | f (336) 458-9377
[website](#) | [map](#) | [email](#)

Warrant for Left and Right-Turn Lanes

AT GRADE, UNSIGNALIZED INTERSECTIONS

• Right Turn Storage Lengths are based on opposing volume of 100 VPH (MINIMUM)
S=STORAGE LENGTH REQUIRED



LEGEND	
□	AM PEAK HOUR, V_L
○	PM PEAK HOUR, V_L
□	AM PEAK HOUR, V_R
○	PM PEAK HOUR, V_R

V_L : LEFT TURNING VOLUME (VPH)
 V_R : RIGHT TURNING VOLUME (VPH)

Note: Where adjacent signalization may provide opportunities for gaps in the traffic stream a reduction in the above storage values can be considered on a case by case basis.

Peak Hour	Volumes	
	Opposing	Lefts
AM	N/A	N/A
PM	N/A	N/A
Peak Hour	Volumes	
	Opposing	Rights
AM	836	40
PM	843	83

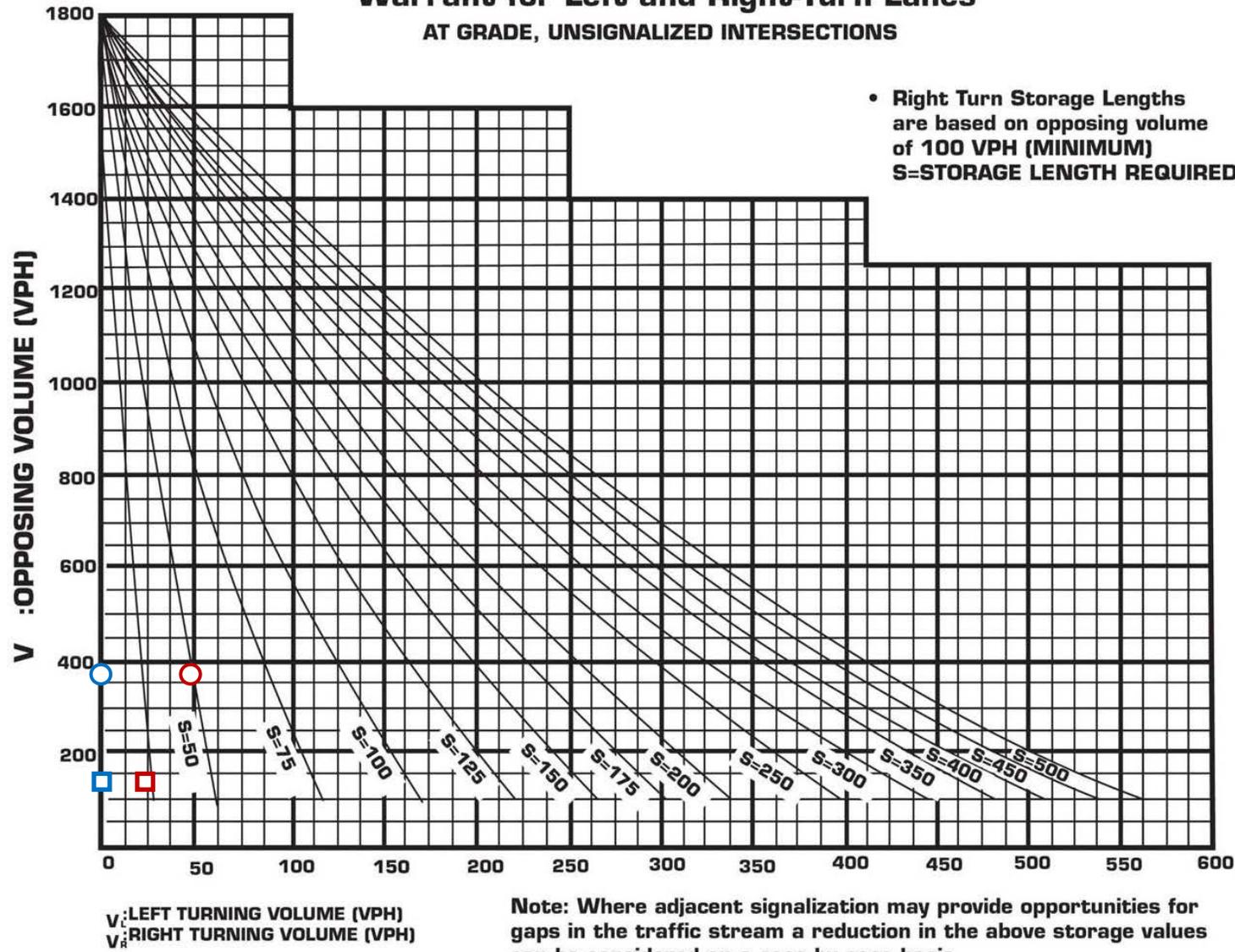


DAVENPORT

TURN LANE WARRANT SUMMARY

US 17 at Lendire Access Road

Warrant for Left and Right-Turn Lanes AT GRADE, UNSIGNALIZED INTERSECTIONS



Peak Hour	Volumes	
	Opposing	Lefts
AM	139	3
PM	374	5

Peak Hour	Volumes	
	Opposing	Rights
AM	139	23
PM	374	49





305 Chestnut Street
PO Box 1810
Wilmington, NC 28402
Ph: (910) 341-3258
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May 8, 2019

Mr. Dan Cumbo, PE
Davenport Transportation Consultants
3722 Shipyard Blvd, Suite E
Wilmington, NC 28403

RE: Approved Scope for the Traffic Impact Analysis (TIA) associated with the proposed
Middle Sound West
New Hanover County, NC

Dear Mr. Cumbo

Based on the information provided and conversations held to date, it is our understanding that the proposed development will consist of:

- LUC 220: 49 Multifamily Housing (Low-Rise)
- LUC 221: 240 Multifamily Housing (Mid-Rise) – Project proposes 3 Story buildings
- LUC 712: 32 Employees, Small Office Building

The site plan provided proposes access at the following points:

- SR 2892 (Lendire Road) at Site Access 1
- Lendire access road (not state maintained) at Site Access 2 (southern proposed access located at access easement for 17-acre parcel)

Below please find the scope to be used for the Traffic Impact Analysis:

1. **Data Collection - Analysis Parameters:**

a) Study Intersections

i. For existing intersections, provide turning movement counts for weekday during school (T,W,TH) AM (7:00am-9:00am) and PM (4:00pm-6:00pm) peak periods, signal timing (if applicable), and lane geometry:

- US 17 (Market Street) at SR 1403 (Middle Sound Loop Road) / SR 2892 (Lendire Road)
- US 17 (Market Street) at Lendire access road (not state maintained)
- SR 2892 (Lendire Road) at Lendire access road (not state maintained)
- SR 2892 (Lendire Road) at Site Access 1

Wilmington Urban Area Metropolitan Planning Organization

- Lendire access road (not state maintained) at Site Access 2 (southern proposed access located at access easement for 17-acre parcel)

- ii. Traffic Signal plans may be acquired by sending an email request to NCDOT and the City of Wilmington - NCDOT Traffic Services: Ross Kimbro, rkimbrow@ncdot.gov or by calling (910) 341-2200 and the City of Wilmington: Denys Vielkanowitz, denys.vielkanowitz@wilmingtonnc.gov or by calling (910) 341-4676.

b) Site Trip Generation, Site Trip Distribution and Background Traffic Assumptions

- i. Site Trip Generation Estimate
 - Trip Generation (provided by Davenport and approved by TIA Review Team)
- ii. Site Trip Distribution
 - To be submitted for approval and approved prior to use in the TIA
- iii. Adjacent Development (approved but not yet built):
 - Ogden Starbucks
- iv. Planned Roadway Improvements
 - NCDOT STIP Projects U-4902D (Design Year 2038) and U-4751 (Design Year 2037)
 - Traffic counts and trip distribution must be modeled in the configuration of U-4902D and U-4751 for this TIA.
 - If the development has been rezoned from what was included in the TIP forecast, then the TIA must include a TIP design year (2038) analysis for the difference of the zoned use.
 - If there is no change in zoning, the TIA must include the Build year of the development, but not a TIP design year analysis.
 - The TIA must include documentation of zoning in TIP forecast.
- v. Background Traffic Assumptions
 - Future Build 2021
 - Growth rate – 1% per year

2. **Capacity Analysis: Week day AM & PM Peak Hour**

- a) Technical Analysis
 - i. 2019 Existing Conditions
 - ii. 2021 Future No-Build
[Existing + 1% background growth + approved development trips]
 - iii. 2021 Build Conditions
[Existing + 1% background growth + approved development trips + site trips]
 - iv. 2021 Build Conditions + improvements

3. **Final Report Submittal:**

- a) Completed TIA Application
- b) Signed and sealed by a Professional Engineer
- c) Four bound copies
- d) Four Electronic copies to include PDF of TIA and Synchro output files and Synchro analysis files in digital format

4. **Notes:**

- a) This scope shall remain valid for three months from the date of this letter.

- b) Please note that if any changes occur (including but not limited to; land use, intensity, phasing, and/or site access) additional analysis may be required.

Please contact me at 910-772-4170 with any questions regarding this scope.

Sincerely,



Fred Royal, PE, CFM
Project Engineer
Wilmington Metropolitan Planning Organization

Attachments: *Revised* Trip Generation Summary (approved as attached)
Traffic Impact Analysis Supplemental Guidelines
Site Map (provided by Davenport)

cc: Ben Hughes, PE, District Engineer, NCDOT
Alex Stewart, PE, Deputy District Engineer, NCDOT
Madi Lee, EI, Development Review Engineer, NCDOT
Jon Roan, Assistant District Engineer, NCDOT
Jessi Leonard, PE, Division Traffic Engineer, NCDOT
Kirsten Spirakis, PE, Senior Assistant Traffic Engineer, NCDOT
Mike Kozlosky, Executive Director, WMPO
Amy Kimes, PE, Senior Project Engineer, WMPO
Bill McDow, Transportation Planner, WMPO
Don Bennett, PE, Traffic Engineer, City of Wilmington
Denys Vielkanowitz, PE, Signal Systems Management Engineer, City of Wilmington
Brad Schuler, Senior Planner, New Hanover County

APPROVED

5/9/19 TIA Review Team

Table A - ITE Trip Generation									
Middlesound West									
Average Weekday Driveway Volumes					24 Hour Two-Way	AM Peak Hour		PM Peak Hour	
Land Use	ITE Land Code	Size		Method/ Type	Volume	Enter	Exit	Enter	Exit
Multifamily Housing (Low- Rise)	220	49.0	Dwelling Units	Adjacent/ Equation	330	6	19	20	12
Multifamily Housing (Mid- Rise)	221	240.0	Dwelling Units	Adjacent/ Equation	1,306	21	60	63	40
Small Office Building	712	32.0	Employees	Generator/ Equation	255	25	14	29	32
Total Unadjusted Trips					1,891	52	93	112	84