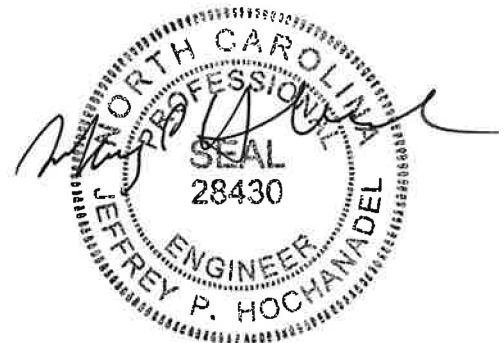


# Liberty Classical Academy

## Traffic Impact Analysis

Weddington, North Carolina

May 2023



*Prepared for:*

5/08/23

# Cambridge Properties

**TIMMONS GROUP**

YOUR VISION ACHIEVED THROUGH OURS.



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Appendix B – Traffic Counts

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Appendix D – Synchro / SimTraffic Analysis Outputs

Appendix E – Weighted Peak Hour Factors

Appendix F – MSTA School Calculator

Appendix G – Traffic Management Plans

Appendix H – STIP Project information

## 1 INTRODUCTION

This report presents the proposed Liberty Classical Academy traffic impact analysis (TIA) findings. The proposed school will be located south of NC-84 (Weddington Road) and east of NC-16 (Providence Road S), in Weddington, NC (see **Figure 1-1**). The proposed development will consist of a 600-student high school, a 500-student middle school, and a 400-student elementary school.

Analyses were completed for the following scenarios:

- 2023 Existing traffic volumes;
- 2026 Background traffic volumes;
- 2028 Background traffic volumes;
- 2031 Background traffic volumes;
- 2026 Build traffic volumes (High School);
- 2028 Build traffic volumes (Middle School);
- 2031 Build traffic volumes (Elementary School);
- 2040 Horizon Year Background traffic volumes\*; and
- 2040 Horizon Year Build traffic volumes\* (High School).

\* Providence Road S / Rae Road intersection

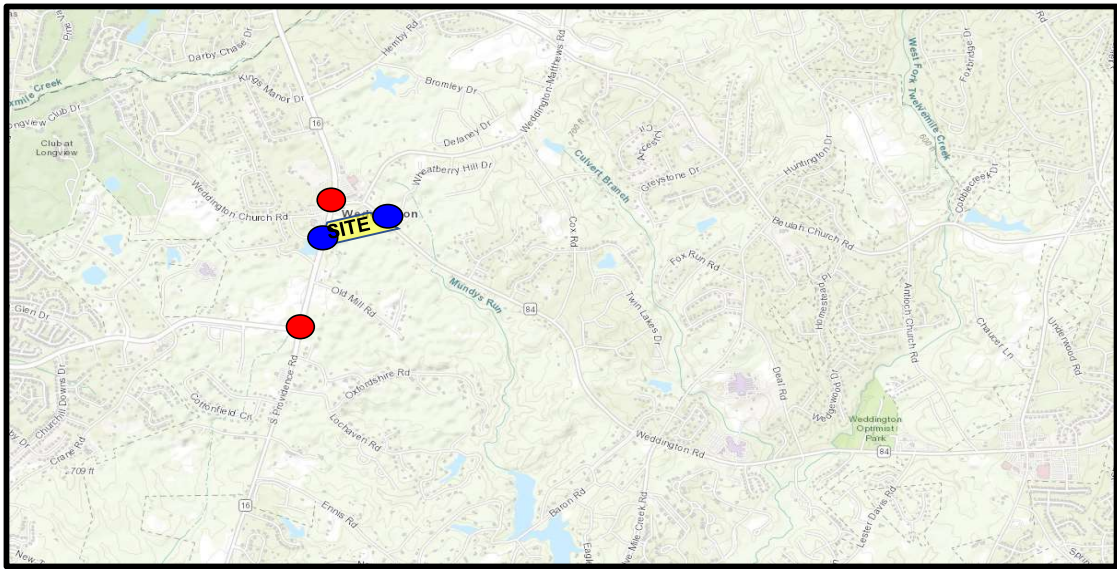
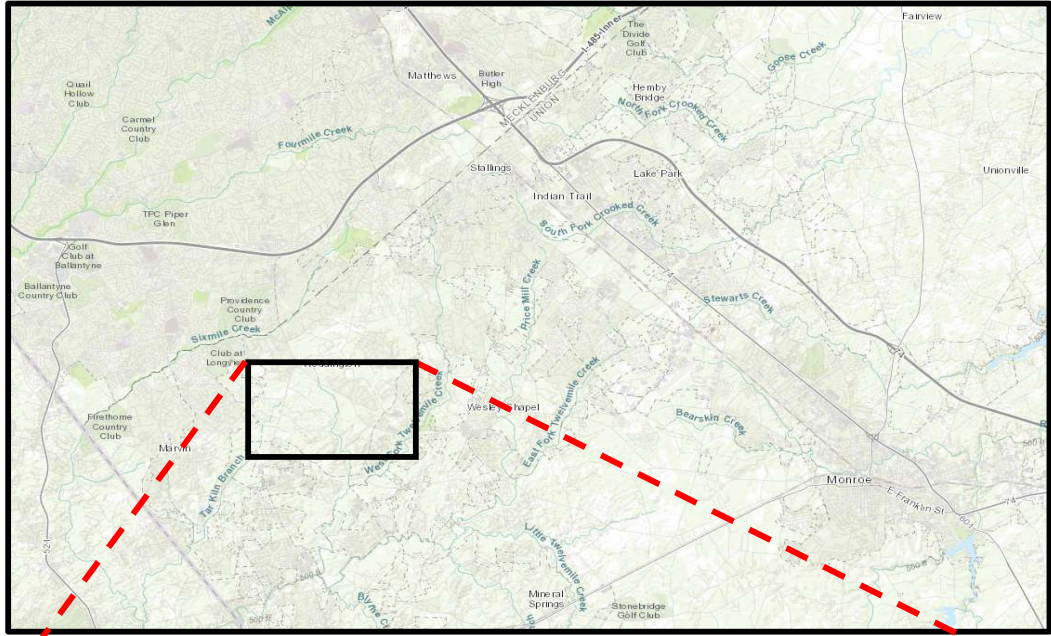
The TIA's purpose is as follows:

1. Verify that the existing geometry provided within the study area is sufficient to accommodate the projected traffic volumes; and
2. Determine what, if any, improvements are necessary at the proposed site driveway connections to NC-16 (Providence Road S) and NC-84 (Weddington Road).

The following steps were taken to determine the potential traffic impacts associated with this project:

1. Data Collection – AM (7:00 – 9:00) and school PM (2:00 – 4:00) peak hour turning movement counts were collected in January 2023 at the following intersections:
  - NC-16 (Providence Road S) / NC-84 (Weddington Road);
  - NC-84 (Weddington Road) / Wheatberry Hill Drive;
  - NC-16 (Providence Road S) / Lenny Stadler Way; and
  - NC-16 (Providence Road S) / SR-1316 (Rea Road).
2. Trip Generation/Future Traffic – Traffic generated by the proposed development was estimated using the NCDOT's MSTA School Calculator for urban charter schools (as required by MSTA). Projected Background traffic volumes were calculated using a 2.5% ambient growth rate. Per the scoping document (see **Appendix A**), there are currently no approved developments within the study area.
3. Trip Distribution and Projections – The site-generated trip distribution was based on existing area traffic as well as Engineering judgement.
4. Traffic Capacity Analysis – Level of service analyses were performed using SYNCHRO Version 11.1 for the following intersections:
  - NC-16 (Providence Road S) / NC-84 (Weddington Road);
  - NC-84 (Weddington Road) / Wheatberry Hill Drive / Site Access 2;

- NC-16 (Providence Road S) / Lenny Stadler Way / Site Access 1; and
  - NC-16 (Providence Road S) / SR-1316 (Rea Road).
5. Queuing Analysis – The SYNCHRO 95th percentile queue lengths from the capacity analyses were analyzed at the intersections listed above.
  6. Review of Proposed Improvements – Roadway improvements proposed to accommodate projected site-generated traffic were evaluated.



NOT TO SCALE

**Legend**

- = Study Area Intersection
- = Study Area / Site Access Intersection



# Liberty Classical Academy Traffic Impact Analysis Site Location Map

Figure  
1-1



## 2 EXISTING INFORMATION

The proposed school will be located south of NC-84 (Weddington Road) and east of NC-16 (Providence Road S), in Weddington, NC (see **Figure 1-1**).

### 2.1 STUDY LIMITS

Site access will be provided via one full-movement connection off Providence Road S opposite Lenny Stadler Way (Site Driveway 1) and one full movement connection off Weddington Road opposite Wheatberry Hill Drive (Site Driveway 2).

The Site Driveways are shown graphically in **Figure 2-1** and in the preliminary school site layout (see **Figure 2-2**). All figures are located at the end of their respective chapter(s).

The study limits include the following four (4) intersections:

- NC-16 (Providence Road S) / NC-84 (Weddington Road);
- NC-84 (Weddington Road) / Wheatberry Hill Drive / Site Access 2;
- NC-16 (Providence Road S) / Lenny Stadler Way / Site Access 1; and
- NC-16 (Providence Road S) / SR-1316 (Rea Road).

### 2.2 EXISTING ROADWAYS

**NC-16 (Providence Road S)** is a four-lane facility that travels approximately north-south in the project study area providing a connection between Waxhaw and Charlotte. Within the study area, NC-16 primarily serves institutional and commercial uses. The facility is classified by NCDOT as a minor arterial and has a varying speed limited (changing from 35-mph to 45-mph south of Lenny Stadler Way). Per published NCDOT Average Annual Daily Traffic (AADT) maps, Providence Road S had a 2021 AADT of 29,000 vehicles per day (VPD) north of Lenny Stadler Way.

**NC-84 (Weddington Road)** is a two-lane facility that travels approximately east-west in the project study area providing a connection between Weddington and Monroe. Within the study area, NC-16 primarily serves residential uses. The facility is classified by NCDOT as a minor arterial and has a posted 35-mph speed limit. Per published NCDOT AADT maps, Weddington Road had a 2021 AADT of 20,000 VPD east of Lenny Stadler Way.

**SR-1316 (Rae Road)** is a four-lane facility that travels approximately east-west in the project study area. Rae Road, also known as Marvin School Road, primarily serves residential uses. The facility is classified by NCDOT as a minor arterial and has a posted 35-mph speed limit. Per published NCDOT AADT maps, Rae Road had a 2018 AADT of 16,500 VPD west of Providence Road S.

**Lenny Stadler Way** is a two-lane facility that travels approximately east-west in the project study area. Within the study area, Lenny Stadler Way primarily serves residential uses. The facility is classified by NCDOT as a local road and has a 35-mph speed limit. There is no available AADT data available for this facility.

**Wheatberry Hill Drive** is a two-lane facility that travels approximately north-south in the project study area. Within the study area, Wheatberry Hill Drive primarily serves residential uses. The facility is classified by NCDOT as a local road and has a posted 25-mph speed limit. There is no available AADT data available for this facility.

Note: All roadways classified per the NCDOT Functional Class Map.

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### **2.3 EXISTING INTERSECTIONS**

Using available aerial imagery, Timmons Group compiled the existing study area intersection geometry. The existing intersection geometry is shown in **Figure 2-2**.

Providence Road S / Church Parking Lot / Weddington Road is a six-phase signalized intersection with split side street phasing. The northbound approach consists of an exclusive left-turn lane, two through lanes, and an exclusive right-turn lane. The southbound approach consists of two exclusive left-turn lanes, a through lane, and a shared through / right-turn lane. The eastbound approach consists of a single shared left / through / right-turn lane. The westbound approach consists of an exclusive left-turn lane, a shared through / left-turn lane, and an exclusive right-turn lane.

Providence Road S / Lenny Stadler Way is a three-phased signalized T-intersection with protected / permitted northbound left-turn phasing. The northbound approach consists of an exclusive left-turn lane and two through lanes. The southbound approach consists of a through lane and a shared through / right-turn lane. The eastbound approach consists exclusive left and right-turn lanes.

Providence Road S / Rae Road is a three-phased signalized T-intersection with protected only northbound left-turn phasing. The northbound approach consists of two exclusive left-turn lanes and two through lanes. The southbound approach consists of an exclusive left-turn (U-turn) lane, a through lane, and an exclusive right-turn lane. The eastbound approach consists of exclusive left and right-turn lanes.

Weddington Road / Wheatberry Hill Drive is an unsignalized T-intersection with the southbound approach encountering the stopped condition. The southbound approach consists of a shared left / right-turn lane. The eastbound approach consists of an exclusive left-turn lane and a through lane. The westbound approach consists of a through lane and an exclusive right-turn lane.

### **2.4 TRAFFIC VOLUMES**

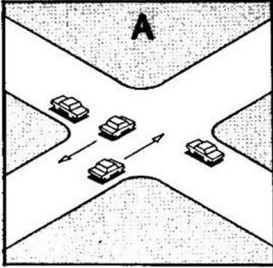
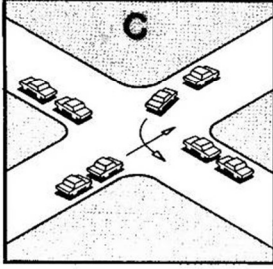
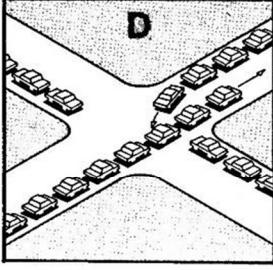
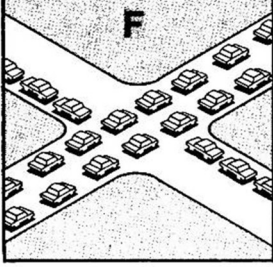
Timmons Group calculated peak hour volumes for the study area intersections using the AM (7:00 – 9:00) and School PM (2:00 – 4:00) peak period turning movement counts undertaken in January 2023. Traffic count data is summarized in **Figure 2-3**. The complete traffic count data can be found in **Appendix B**.

### **2.5 CAPACITY ANALYSIS**

Using field observations, aerial photography, and traffic count data, traffic operations were analyzed during 2023 (existing), 2026 (without and with high school site trips), 2028 (without and with middle school site trips), 2031 (without and with elementary school site trips), and 2040 Horizon Year (without and with high school site trips for the Providence Road S / Rae Road intersection).

Capacity analysis allows traffic engineers to determine the impacts of traffic on the surrounding roadway network. The Transportation Research Board's (TRB) *Highway Capacity Manual* (HCM) methodologies govern how the capacity analyses are conducted and how the results are interpreted. There are six letter grades of Levels of Service (LOS) from A to F, with LOS A representing the best operating conditions and LOS F the worst operating conditions. At signalized intersections, an overall intersection LOS E is generally considered unacceptable. At unsignalized intersections, a LOS E is generally considered acceptable only if the side street encounters delay. Nevertheless, side streets typically function at a LOS F during peak traffic periods, because the traffic volumes often do not warrant a traffic signal to assist side street traffic. **Table 2-1** shows in detail how each of these levels of service are interpreted.

**Table 2-1: Level of Service Definitions**

Level of Service	Roadway Segments or Controlled Access Highways	Intersections	
A	Free flow, low traffic density.	No vehicle waits longer than one signal indication.	
B	Delay is not unreasonable, stable traffic flow.	On a rare occasion motorists wait through more than one signal indication.	
C	Stable condition, movements somewhat restricted due to higher volumes, but not objectionable for motorists.	Intermittently drivers wait through more than one signal indication, and occasionally backups may develop behind left turning vehicles, traffic flow still stable and acceptable.	
D	Movements more restricted, queues and delays may occur during short peaks, but lower demands occur often enough to permit clearing, thus preventing excessive backups.	Delays at intersections may become extensive with some, especially left-turning vehicles waiting two or more signal indications, but enough cycles with lower demand occur to permit periodic clearance, thus preventing excessive backups.	
E	Actual capacity of the roadway involves delay to all motorists due to congestion.	Very long queues may create lengthy delays, especially for left-turning vehicles.	
F	Forced flow with demand volumes greater than capacity resulting in complete congestion. Volumes drop to zero in extreme cases.	Backups from locations downstream restrict or prevent movement of vehicles out of approach creating a storage area during part or all of an hour.	

SOURCE: "A Policy on Design of Design of Urban Highways and Arterial Streets" - AASHTO, 1973 based upon material published in "Highway Capacity Manual", National Academy of Sciences, 1965.

For signalized and unsignalized intersections, level of service is defined in terms of **delay**, a measure of driver discomfort, frustration, fuel consumption and lost travel time. **Table 2-2** summarizes the delay associated with each LOS category:

**Table 2-2: Signalized and Unsignalized Intersection Level of Service Criteria**

Signalized Intersections		Unsignalized Intersections	
Level of Service	Control Delay per Vehicle (sec/veh)	Level of Service	Average Control Delay (sec/veh)
A	≤ 10	A	0 to 10
B	> 10 to ≤ 20	B	> 10 to ≤ 15
C	> 20 to ≤ 35	C	> 15 to ≤ 25
D	> 35 to ≤ 55	D	> 25 to ≤ 35
E	> 55 to ≤ 80	E	> 35 to ≤ 50
F	> 80	F	> 50

*Source: Exhibit 16-2 and Exhibit 17-2 from TRB's "Highway Capacity Manual 2000"*

Capacity analyses were performed to assess operational conditions. Study area intersections were analyzed using SYNCHRO Version 11.1 based on Highway Capacity Manual (HCM) methodologies with the following assumptions:

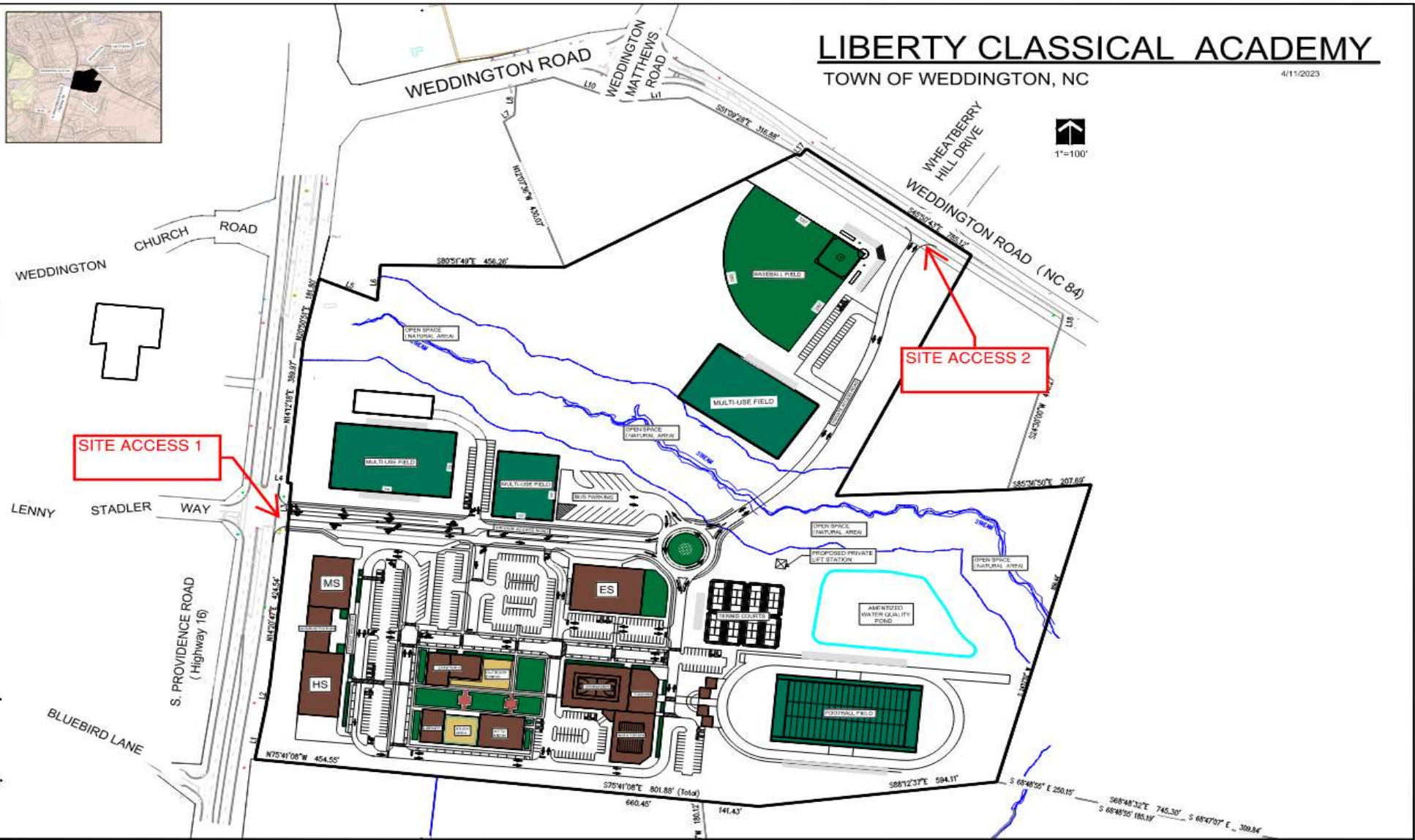
- Existing grades;
- 12-foot lane widths;
- No parking activity, bus stops, or pedestrians;
- Existing traffic signal plan timings (see **Appendix C**) for existing conditions;
- Optimized traffic signal timings for Background and Build conditions;
- Peak hour factor (PHF) of 0.90 for all Existing and Background conditions;
- Weighted PHF (0.9 for Background, 0.5 for school trips) for all Build conditions (see **Appendix E**);
- 2% heavy vehicle percentage; and
- A minimum of 4 vehicles per analyzed intersection movement.



# LIBERTY CLASSICAL ACADEMY

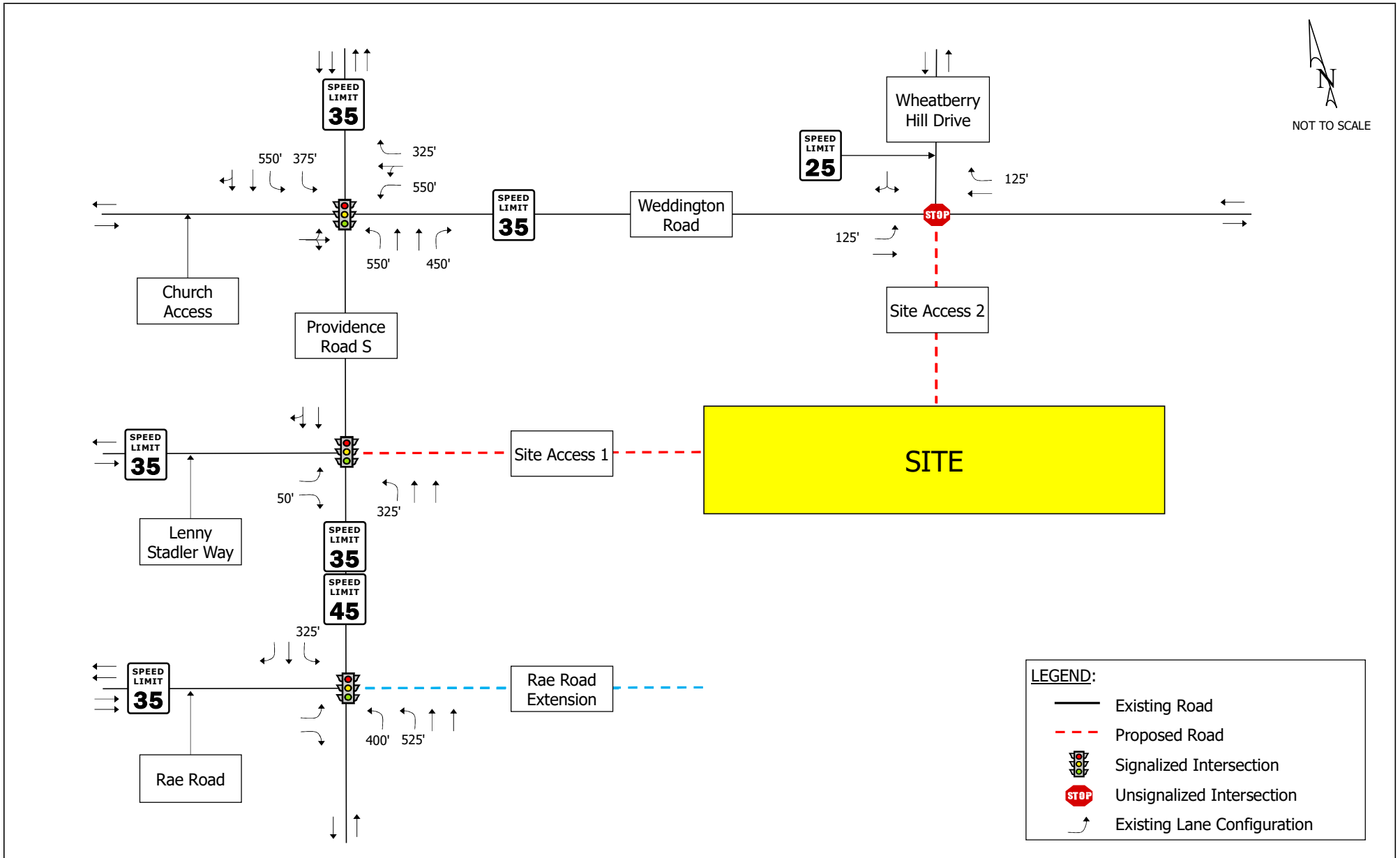
TOWN OF WEDDINGTON, NC

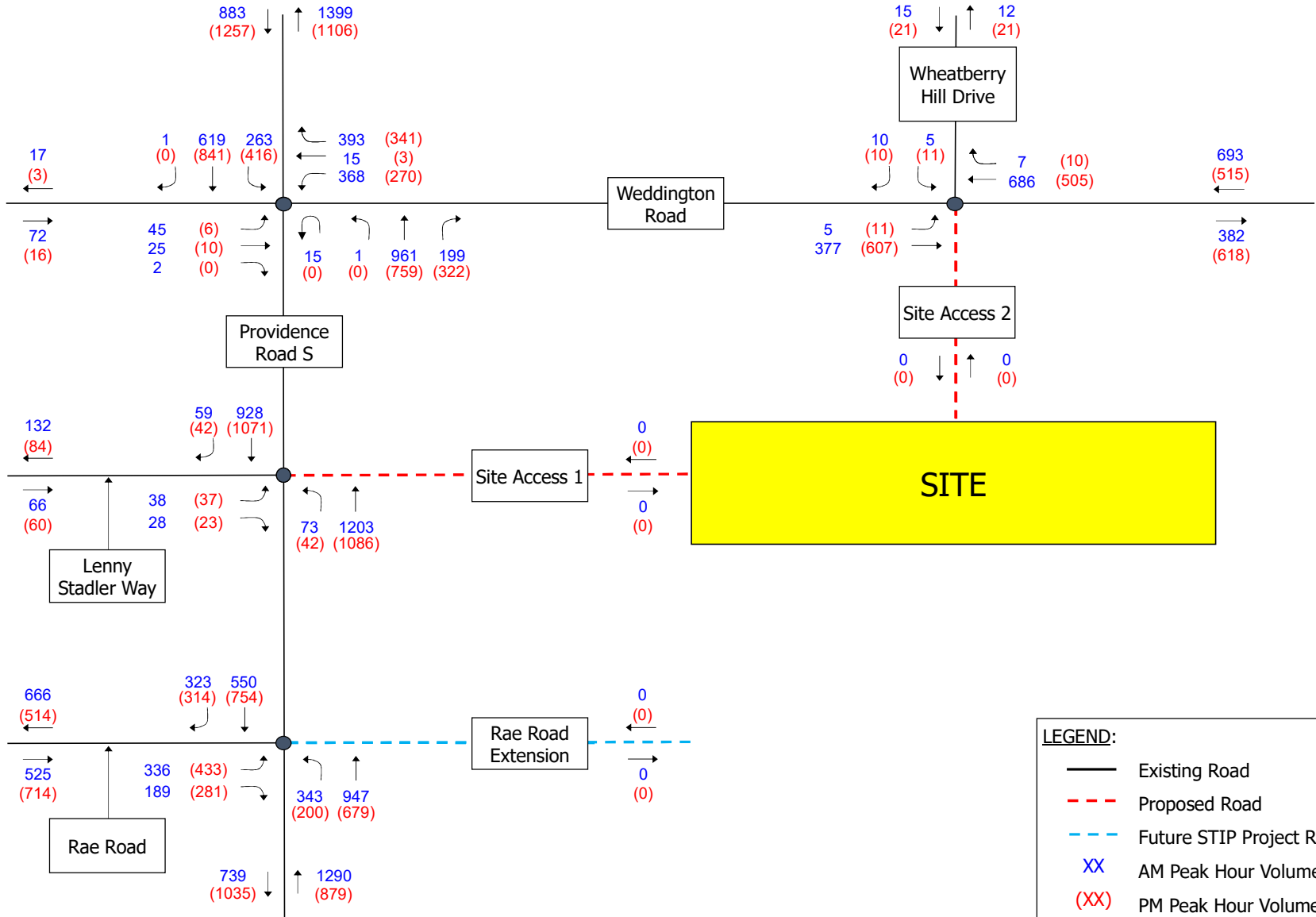
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**Liberty Classical Academy  
Traffic Impact Analysis  
Sketch Plan**

Figure 2-1





**LEGEND:**

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



**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 2023 Existing Traffic Volumes

Figure 2-3

### 3 EXISTING AND BACKGROUND CONDITIONS AND ANALYSIS

#### 3.1 2023 EXISTING ANALYSIS

**Table 3-1** summarizes the 2023 Existing intersection LOS, delay, and 95<sup>th</sup> percentile queue lengths based on the geometry shown on **Figure 2-2** and the 2023 Existing traffic volumes shown on **Figure 2-3**. The corresponding SYNCHRO output is included in **Appendix D**.

The signalized intersection of Providence Road S / Church Parking Lot / Weddington Road is currently operating at an overall LOS C during both 2023 Existing peak hours. The eastbound approach is currently operating unacceptably during the AM peak hour. All other approaches are currently operating at a LOS D or better.

The signalized intersection of Providence Road S / Lenny Stadler Way is currently operating an overall LOS A during both 2023 Build peak hours. All approaches are currently operating a LOS C or better.

The signalized intersection of Providence Road S / Rae Road is currently operating an overall LOS C and E during the 2023 Build AM and PM peak hours, respectively. The eastbound approach is projected to operate unacceptably during both peak hours. All other approaches are currently operating a LOS D or better.

All Weddington Road / Wheatberry Hill Drive unsignalized intersection approaches are currently operating a LOS C or better during both 2023 Build peak hours.



**Table 3-1: Intersection Level of Service, Delay and 95<sup>th</sup> Percentile Queue Summary  
2023 Existing Traffic Volumes**

Intersection	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR			
			Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)
1: Providence Road S & Church Parking Lot/Weddington Road	EB Left/Thru/Right		<b>76.3</b>	<b>E</b>	#146	118	41.9	D	39	49
	EB Approach		<b>76.3</b>	<b>E</b>	--	--	41.9	D	--	--
	WB Left	550	54.5	D	#276	192	40.6	D	164	109
	WB Left/Thru		54.1	D	#275	201	40.3	D	163	149
	WB Right	325	29.1	C	#340	301	16.2	B	204	230
	WB Approach		41.5	D	--	--	27.0	C	--	--
	NB Left	550	50.9	D	37	52	41.8	D	13	26
	NB Thru		39.7	D	435	434	29.0	C	325	227
	NB Right	450	11.5	B	109	146	12.1	B	186	179
	NB Approach		35.1	D	--	--	24.0	C	--	--
	SB Dual Lefts	450	42.9	D	148	205	32.8	C	206	224
	SB Thru/Right		16.2	B	213	185	11.9	B	311	160
	SB Approach		24.1	C	--	--	18.8	B	--	--
Overall			34.5	C	--	--	22.5	C	--	--
2: Providence Road S & Lenny Stadler Way	EB Left		20.8	C	38	51	23.1	C	40	56
	EB Right	50	12.7	B	22	50	14.8	B	22	47
	EB Approach		17.4	B	--	--	19.8	B	--	--
	NB Left	325	3.4	A	17	82	2.9	A	11	55
	NB Thru		3.0	A	138	140	2.6	A	117	133
	NB Approach		3.0	A	--	--	2.6	A	--	--
	SB Thru/Right		9.5	A	205	163	8.2	A	240	150
	SB Approach		9.5	A	--	--	8.2	A	--	--
	Overall			6.2	A	--	--	5.8	A	--
3: Providence Road S & Rae Road	EB Left		<b>86.5</b>	<b>F</b>	#431	549	<b>272.8</b>	<b>F</b>	#658	1360
	EB Right		16.1	B	136	134	26.9	C	247	1355
	EB Approach		<b>61.1</b>	<b>E</b>	--	--	<b>176.0</b>	<b>F</b>	--	--
	NB Dual Lefts	450	34.5	C	151	227	39.8	D	104	177
	NB Thru		6.6	A	135	151	4.9	A	86	116
	NB Approach		14.0	B	--	--	12.8	B	--	--
	SB Thru		27.7	C	365	435	31.3	C	597	580
	SB Right		5.8	A	97	202	4.4	A	91	308
	SB Approach		19.6	B	--	--	23.4	C	--	--
	Overall			25.0	C	--	--	<b>60.8</b>	<b>E</b>	--
4: Weddington Road & Wheatberry Hill Drive	EB Left	125	9.3	A	0	21	8.6	A	0	30
	EB Thru		0.0	A	0	0	0.0	A	0	0
	EB Approach		0.1	A	--	--	0.2	A	--	--
	WB Thru		0.0	A	0	0	0.0	A	0	0
	WB Right	125	0.0	A	0	0	0.0	A	0	0
	WB Approach		0.0	A	--	--	0.0	A	--	--
	SB Left/Right		17.4	C	0.2	38	19.7	C	0.3	42
SB Approach		17.4	C	--	--	19.7	C	--	--	

<sup>1</sup> Overall intersection LOS and delay not reported for TWSC intersections.

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

### **3.2 BACKGROUND TRAFFIC VOLUMES**

**Figures 3-1, 3-2, and 3-3** show the 2026, 2028, and 2031 ambient traffic volumes (respectively) calculated using a 2.5% growth rate.

Per the scoping document (see **Appendix A**), there are no approved study area developments. There are two public improvement projects within the study area (U-5769B and U-3467), with construction years of 2028 and 2029 respectively. Due to uncertainty regarding the project completion years, the subject analyses were conducted without considering these improvements. A horizon year analysis including both public improvement projects is found in **Section 6** below.

### **3.3 2026 BACKGROUND ANALYSIS**

**Table 3-2** summarizes the 2026 Background intersection LOS, delay, and 95<sup>th</sup> percentile queue lengths based on the geometry shown in **Figure 2-2** and includes the 2026 Background traffic volumes shown in **Figure 3-1**. The corresponding SYNCHRO output is included in **Appendix D**.

The signalized intersection of Providence Road S / Church Parking Lot / Weddington Road is projected to operate at an overall LOS D and C during the 2026 Background AM and PM peak hours, respectively. The westbound approach is projected to operate unacceptably during the AM peak hour. All other approaches are projected to operate at a LOS D or better.

The signalized intersection of Providence Road S / Lenny Stadler Way is projected to operate at an overall LOS A during both 2026 Background peak hours. All approaches are projected to operate at a LOS C or better.

The signalized intersection of Providence Road S / Rae Road is projected to operate at an overall LOS C and D during the 2026 Background AM and PM peak hours, respectively. The eastbound approach is projected to operate unacceptably during the PM peak hour. All other approaches are projected to operate at a LOS D or better.

All Weddington Road / Wheatberry Hill Drive unsignalized intersection approaches are projected to operate at a LOS C or better during both 2026 Background peak hours.

**Table 3-2: Intersection Level of Service, Delay and 95<sup>th</sup> Percentile Queue Summary  
2026 Background Traffic Volumes**

Intersection	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR			
			Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)
1: Providence Road S & Church Parking Lot/Weddington Road	EB Left/Thru/Right		<b>72.7</b>	<b>E</b>	#146	127	48.5	D	45	47
	EB Approach		<b>72.7</b>	<b>E</b>	--	--	48.5	D	--	--
	WB Left	550	<b>63.5</b>	<b>E</b>	#309	225	45.0	D	202	158
	WB Left/Thru		<b>62.9</b>	<b>E</b>	#308	251	44.5	D	197	167
	WB Right	325	39.0	D	#334	336	18.8	B	256	254
	WB Approach		50.9	D	--	--	30.4	C	--	--
	NB Left	550	53.9	D	39	110	48.5	D	15	23
	NB Thru		42.4	D	528	542	30.0	C	395	330
	NB Right	450	12.3	B	132	274	12.7	B	234	244
	NB Approach		37.5	D	--	--	24.9	C	--	--
	SB Dual Lefts	450	45.6	D	158	210	36.3	D	238	270
	SB Thru/Right		16.9	B	242	177	11.7	B	338	173
	SB Approach		25.4	C	--	--	19.8	B	--	--
Overall			38.3	D	--	--	24.0	C	--	--
2: Providence Road S & Lenny Stadler Way	EB Left		22.5	C	42	65	24.9	C	45	59
	EB Right	50	14.3	B	25	58	16.6	B	25	51
	EB Approach		19.1	B	--	--	21.6	C	--	--
	NB Left	325	3.5	A	18	88	2.8	A	12	70
	NB Thru		3.0	A	153	159	2.6	A	129	166
	NB Approach		3.1	A	--	--	2.6	A	--	--
	SB Thru/Right		9.4	A	223	184	8.1	A	266	171
	SB Approach		9.4	A	--	--	8.1	A	--	--
	Overall			6.2	A	--	--	5.8	A	--
3: Providence Road S & Rae Road	EB Left		49.0	D	#373	321	<b>81.9</b>	<b>F</b>	#596	768
	EB Right		15.5	B	129	140	27.4	C	263	346
	EB Approach		36.9	D	--	--	<b>60.4</b>	<b>E</b>	--	--
	NB Dual Lefts	450	47.5	D	#192	255	<b>79.2</b>	<b>E</b>	#158	225
	NB Thru		10.3	B	220	202	10.7	B	173	204
	NB Approach		20.2	C	--	--	26.3	C	--	--
	SB Thru		38.1	D	#523	649	52.1	D	#884	1511
	SB Right		4.9	A	95	297	2.7	A	65	1225
	SB Approach		25.8	C	--	--	37.5	D	--	--
	Overall			25.3	C	--	--	40.0	D	--
4: Weddington Road & Wheatberry Hill Drive	EB Left	125	9.5	A	0	22	8.8	A	0	35
	EB Thru		0.0	A	0	0	0.0	A	0	0
	EB Approach		0.1	A	--	--	0.2	A	--	--
	WB Thru		0.0	A	0	0	0.0	A	0	0
	WB Right	125	0.0	A	0	0	0.0	A	0	0
	WB Approach		0.0	A	--	--	0.0	A	--	--
	SB Left/Right		18.7	C	0.2	34	21.9	C	0.4	40
	SB Approach		18.7	C	--	--	21.9	C	--	--

<sup>1</sup> Overall intersection LOS and delay not reported for TWSC intersections.

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

### **3.4 2028 BACKGROUND ANALYSIS**

**Table 3-3** summarizes the 2028 Background intersection LOS, delay, and 95<sup>th</sup> percentile queue lengths based on the geometry shown in **Figure 2-2** and the 2028 Background traffic volumes shown in **Figure 3-2**. The corresponding SYNCHRO output is included in **Appendix D**.

The signalized intersection of Providence Road S / Church Parking Lot / Weddington Road is projected to operate at an overall LOS D and C during the 2028 Background AM and PM peak hours, respectively. The westbound approach is projected to operate unacceptably during the AM peak hour. All other approaches are projected to operate at a LOS D or better.

The signalized intersection of Providence Road S / Lenny Stadler Way is projected to operate at an overall LOS A during both 2028 Background peak hours. All approaches are projected to operate at a LOS C or better.

The signalized intersection of Providence Road S / Rae Road is projected to operate at an overall LOS C and D during the 2028 Background AM and PM peak hours, respectively. The eastbound approach is projected to operate unacceptably during the PM peak hour. All other approaches are projected to operate at a LOS D or better.

All Weddington Road / Wheatberry Hill Drive unsignalized intersection approaches are projected to operate at a LOS C or better during both 2028 Background peak hours.

**Table 3-3: Intersection Level of Service, Delay and 95<sup>th</sup> Percentile Queue Summary  
2028 Background Traffic Volumes**

Intersection	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR			
			Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)
1: Providence Road S & Church Parking Lot/Weddington Road	EB Left/Thru/Right		<b>93.9</b>	<b>F</b>	#172	160	49.9	D	47	51
	EB Approach		<b>93.9</b>	<b>F</b>	--	--	49.9	D	--	--
	WB Left	550	<b>70.6</b>	<b>E</b>	#344	288	46.9	D	212	144
	WB Left/Thru		<b>70.3</b>	<b>E</b>	#344	378	46.5	D	207	152
	WB Right	325	45.0	D	#442	386	20.4	C	275	230
	WB Approach		<b>57.6</b>	<b>E</b>	--	--	32.1	C	--	--
	NB Left	550	54.6	D	41	48	49.5	D	15	25
	NB Thru		42.0	D	538	553	31.1	C	418	394
	NB Right	450	11.9	B	132	370	13.1	B	248	246
	NB Approach		37.1	D	--	--	25.8	C	--	--
	SB Dual Lefts	450	46.2	D	167	232	37.7	D	251	270
	SB Thru/Right		15.8	B	244	185	11.9	B	360	210
	SB Approach		24.8	C	--	--	20.4	C	--	--
Overall			40.3	D	--	--	25.0	C	--	--
2: Providence Road S & Lenny Stadler Way	EB Left		27.3	C	50	72	28.3	C	51	66
	EB Right	50	14.9	B	30	53	17.2	B	28	58
	EB Approach		22.0	C	--	--	24.0	C	--	--
	NB Left	325	27.1	C	79	93	28.4	C	55	83
	NB Thru		4.0	A	167	150	3.5	A	141	163
	NB Approach		5.3	A	--	--	4.4	A	--	--
	SB Thru/Right		11.8	B	279	221	9.9	A	305	188
	SB Approach		11.8	B	--	--	9.9	A	--	--
	Overall			8.5	A	--	--	7.6	A	--
3: Providence Road S & Rae Road	EB Left		53.8	D	#399	390	<b>87.9</b>	<b>F</b>	#667	1119
	EB Right		16.0	B	135	168	29.6	C	295	826
	EB Approach		40.2	D	--	--	<b>65.0</b>	<b>E</b>	--	--
	NB Dual Lefts	450	51.9	D	#206	290	<b>92.2</b>	<b>F</b>	#181	251
	NB Thru		10.8	B	236	194	12.1	B	203	220
	NB Approach		21.7	C	--	--	30.3	C	--	--
	SB Thru		42.0	D	#565	658	<b>64.4</b>	<b>E</b>	#1026	1944
	SB Right		5.0	A	100	321	2.7	A	72	1690
	SB Approach		28.3	C	--	--	46.2	D	--	--
	Overall			27.4	C	--	--	46.0	D	--
4: Weddington Road & Wheatberry Hill Drive	EB Left	125	9.7	A	0	27	8.9	A	0	30
	EB Thru		0.0	A	0	0	0.0	A	0	0
	EB Approach		0.1	A	--	--	0.2	A	--	--
	WB Thru		0.0	A	0	0	0.0	A	0	0
	WB Right	125	0.0	A	0	0	0.0	A	0	0
	WB Approach		0.0	A	--	--	0.0	A	--	--
	SB Left/Right		20.4	C	0.2	44	23.4	C	0.4	45
	SB Approach		20.4	C	--	--	23.4	C	--	--

<sup>1</sup> Overall intersection LOS and delay not reported for TWSC intersections.

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

### **3.5 2031 BACKGROUND ANALYSIS**

**Table 3-3** summarizes the 2031 Background intersection LOS, delay, and 95<sup>th</sup> percentile queue lengths based on the geometry shown in **Figure 2-2** and the 2031 Background traffic volumes shown in **Figure 3-3**. The corresponding SYNCHRO output is included in **Appendix D**.

The signalized intersection of Providence Road S / Church Parking Lot / Weddington Road is projected to operate at an overall LOS D and C during the 2031 Background AM and PM peak hours, respectively. The east and westbound approaches are projected to operate unacceptably during the AM peak hour. All other approaches are projected to operate at a LOS D or better.

The signalized intersection of Providence Road S / Lenny Stadler Way is projected to operate at an overall LOS A during both 2031 Background peak hours. All approaches are projected to operate at a LOS C or better.

The signalized intersection of Providence Road S / Rae Road is projected to operate at an overall LOS C and E during the 2031 Background AM and PM peak hours, respectively. The east and southbound approaches are projected to operate unacceptably during the PM peak hour. All other approaches are projected to operate at a LOS D or better.

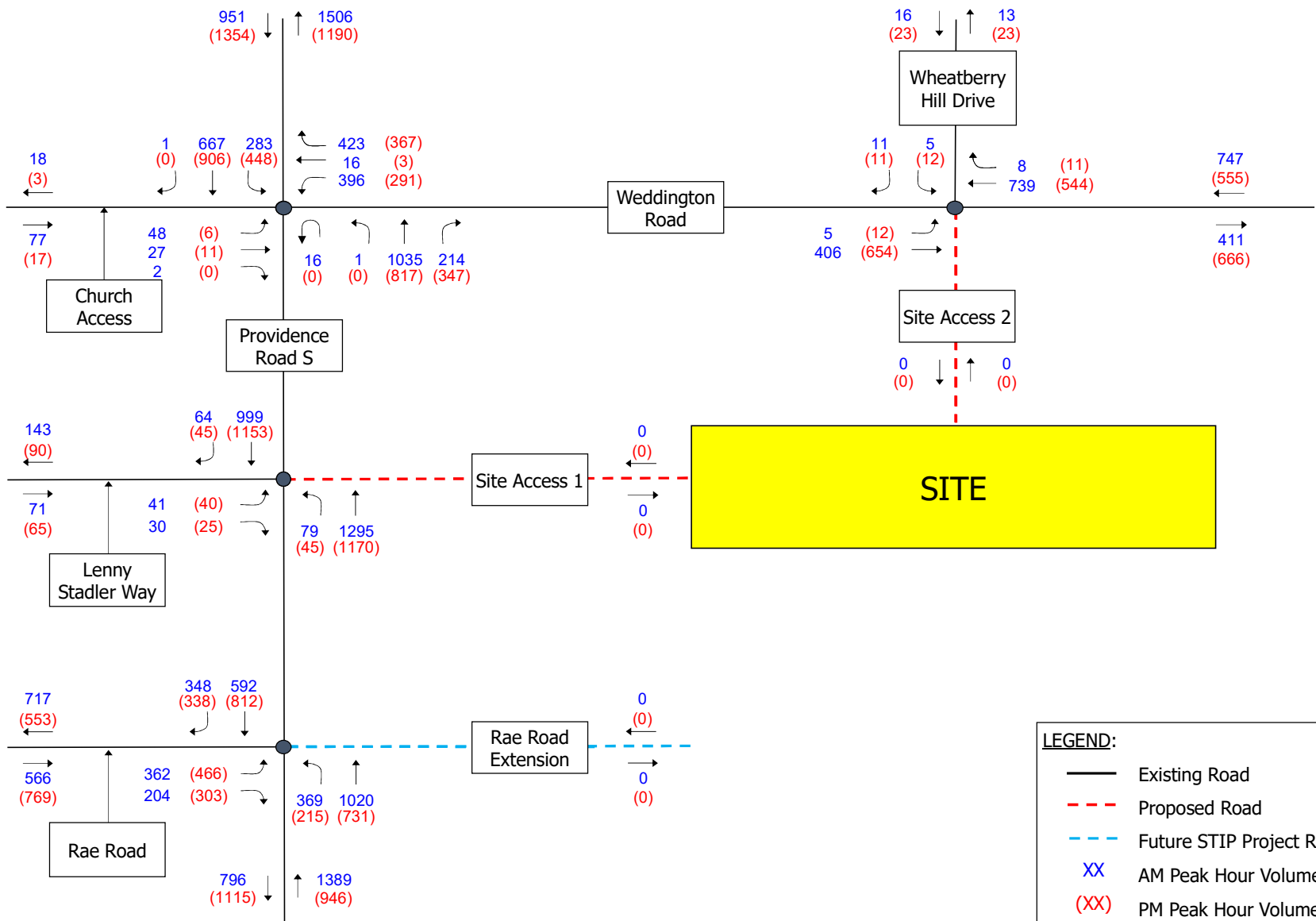
All approaches at the unsignalized intersection of Weddington Road / Wheatberry Hill Drive are projected to operate at a LOS D or better during both 2031 Background peak hours.

**Table 3-3: Intersection Level of Service, Delay and 95<sup>th</sup> Percentile Queue Summary  
2031 Background Traffic Volumes**

Intersection	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR			
			Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)
1: Providence Road S & Church Parking Lot/Weddington Road	EB Left/Thru/Right		<b>113.2</b>	<b>F</b>	#183	148	53.0	D	48	69
	EB Approach		<b>113.2</b>	<b>F</b>	--	--	53.0	D	--	--
	WB Left	550	<b>85.4</b>	<b>F</b>	#381	528	53.8	D	#230	182
	WB Left/Thru		<b>84.1</b>	<b>F</b>	#380	634	53.0	D	226	192
	WB Right	325	54.4	D	#537	423	24.5	C	309	293
	WB Approach		<b>69.4</b>	<b>E</b>	--	--	37.4	D	--	--
	NB Left	550	<b>55.7</b>	<b>E</b>	42	176	51.8	D	15	26
	NB Thru		48.7	D	#643	655	35.3	D	455	387
	NB Right	450	12.6	B	144	512	15.2	B	273	277
	NB Approach		42.7	D	--	--	29.4	C	--	--
	SB Dual Lefts	450	47.4	D	179	256	41.9	D	271	277
	SB Thru/Right		16.1	B	268	204	13.4	B	391	206
	SB Approach		25.4	C	--	--	22.8	C	--	--
Overall			46.3	D	--	--	28.4	C	--	--
2: Providence Road S & Lenny Stadler Way	EB Left		29.9	C	57	70	30.3	C	54	63
	EB Right	50	16.7	B	33	46	19.1	B	31	52
	EB Approach		24.2	C	--	--	26.0	C	--	--
	NB Left	325	29.2	C	90	104	30.5	C	61	86
	NB Thru		4.1	A	188	163	3.5	A	146	156
	NB Approach		5.5	A	--	--	4.5	A	--	--
	SB Thru/Right		12.2	B	318	258	9.8	A	320	227
	SB Approach		12.2	B	--	--	9.8	A	--	--
	Overall			8.9	A	--	--	7.6	A	--
3: Providence Road S & Rae Road	EB Left		<b>64.2</b>	<b>E</b>	#442	560	<b>118.7</b>	<b>F</b>	#749	1338
	EB Right		16.6	B	145	172	32.0	C	329	1282
	EB Approach		47.0	D	--	--	<b>84.7</b>	<b>F</b>	--	--
	NB Dual Lefts	450	<b>63.0</b>	<b>E</b>	#226	346	<b>125.3</b>	<b>F</b>	#206	394
	NB Thru		11.5	B	264	236	12.1	B	220	337
	NB Approach		25.2	C	--	--	37.9	D	--	--
	SB Thru		50.3	D	#636	887	<b>80.7</b>	<b>F</b>	#1132	2579
	SB Right		5.2	A	112	512	2.7	A	76	2511
	SB Approach		33.5	C	--	--	<b>57.6</b>	<b>E</b>	--	--
Overall			32.2	C	--	--	<b>58.4</b>	<b>E</b>	--	--
4: Weddington Road & Wheatberry Hill Drive	EB Left	125	10.0	B	0	20	9.1	A	0	31
	EB Thru		0.0	A	0	0	0.0	A	0	0
	EB Approach		0.1	A	--	--	0.2	A	--	--
	WB Thru		0.0	A	0	0	0.0	A	0	0
	WB Right	125	0.0	A	0	0	0.0	A	0	0
	WB Approach		0.0	A	--	--	0.0	A	--	--
	SB Left/Right		22.3	C	0.3	33	26.9	D	0.5	40
SB Approach		22.3	C	--	--	26.9	D	--	--	

<sup>1</sup> Overall intersection LOS and delay not reported for TWSC intersections.

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



**LEGEND:**

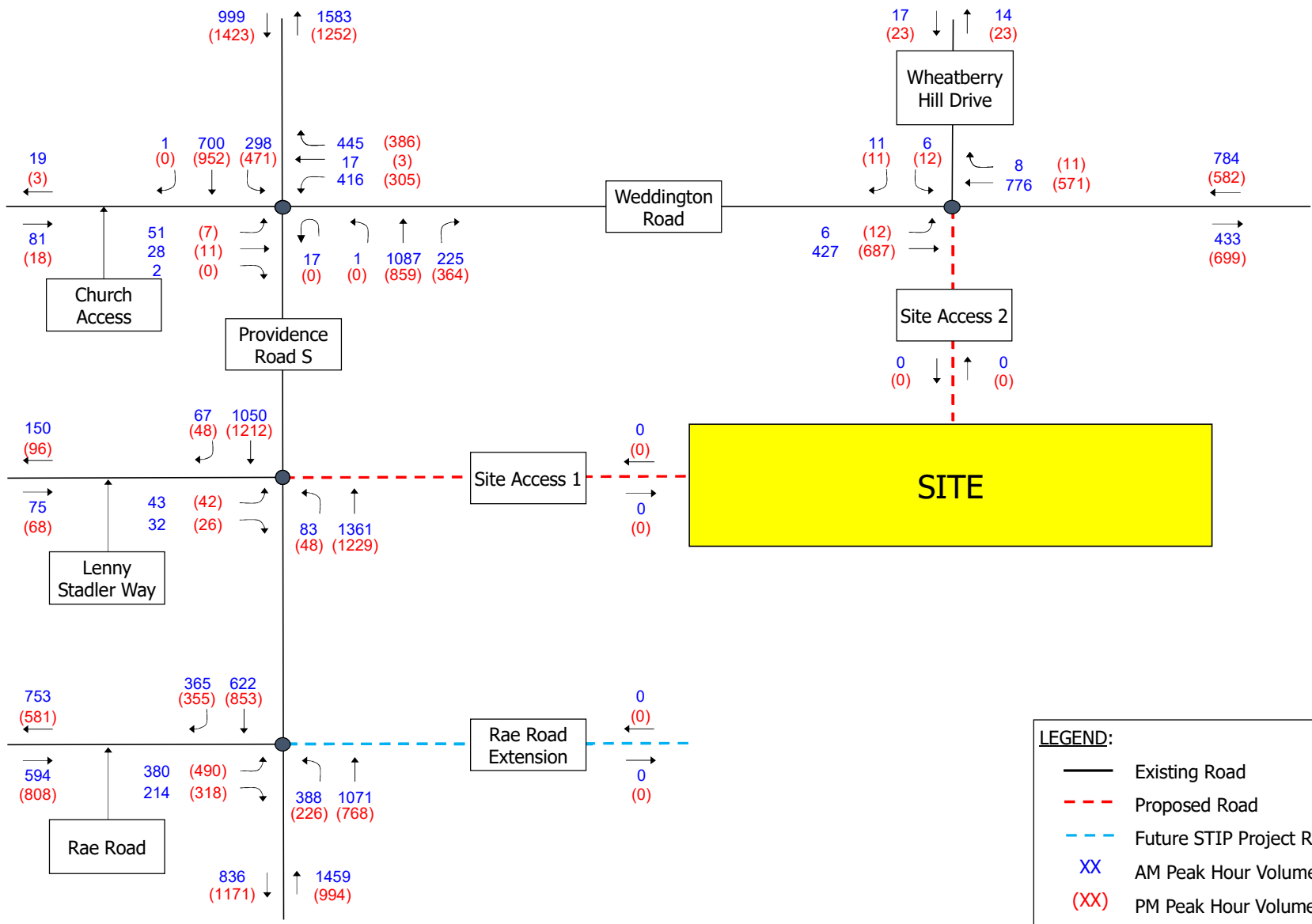
- Existing Road
- - - Proposed Road
- - - Future STIP Project Road
- XX AM Peak Hour Volume (vph)
- (XX) PM Peak Hour Volume (vph)



## Liberty Classical Academy Traffic Impact Analysis 2026 Background Traffic Volumes

Figure 3-1





**LEGEND:**

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



## Liberty Classical Academy Traffic Impact Analysis 2028 Background Traffic Volumes

Figure 3-2



**4 SITE TRIP GENERATION AND DISTRIBUTION**

Liberty Classical Academy Development site trip were estimated based on the proposed land use and distributed onto the surrounding roadway network.

**4.1 TRIP GENERATION**

The proposed development site trip generation was determined using the NCDOT’s Municipal and School Transportation Assistance’s (MSTA) school calculator (see **Appendix F**). The student populations (600 high school students, 500 middle school students, and 400 elementary school students) were used to estimate the traffic generated during the AM and (school) PM peak hours. It should be noted that the MSTA school calculator provides only the school peaking characteristics. While the AM peak hour trips occur concurrently with the adjacent roadway facilities’ AM peak hour, the PM peak hour trips do not. Each school’s PM peak hour will occur between 2:00 p.m. – 4:00 p.m., whereas the PM peak hour of the project study area roadway facilities occurs between 4:00 p.m. – 6:00 p.m. For this reason, PM traffic was analyzed during the school PM peak period (2:00 p.m. – 4:00 p.m.). It should be noted that the schools will operate on a staggered bell schedule (45 minutes) and will not overlap.

Per **Table 4-1**, high school AM trips totaled 714 vehicles with 467 vehicles entering and 247 vehicles exiting. The high school PM trips totaled 638 vehicles with 192 vehicles entering and 446 vehicles exiting.

**Table 4-1: High School Trip Generation Summary**

School	Number of Students	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
High	600 Students	467	247	714	192	446	638

SOURCE: NCDOT’s MSTA School Traffic Calculator Version 102816

Per **Table 4-2**, middle school AM trips totaled 629 vehicles with 349 vehicles entering and 280 vehicles exiting. The middle school PM trips totaled 638 with 192 vehicles entering and 446 vehicles exiting.

**Table 4-2: Middle School Trip Generation Summary**

School	Number of Students	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Middle	500 Students	349	280	629	196	265	461

SOURCE: NCDOT’s MSTA School Traffic Calculator Version 102816

Per **Table 4-3**, elementary school AM trips totaled 504 vehicles with 280 vehicles entering and 224 vehicles exiting. The elementary school PM trips totaled 370 with 157 vehicles entering and 213 vehicles exiting.

**Table 4-3: Elementary School Trip Generation Summary**

School	Number of Students	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Elementary	400 Students	280	224	504	157	213	370

SOURCE: NCDOT’s MSTA School Traffic Calculator Version 102816

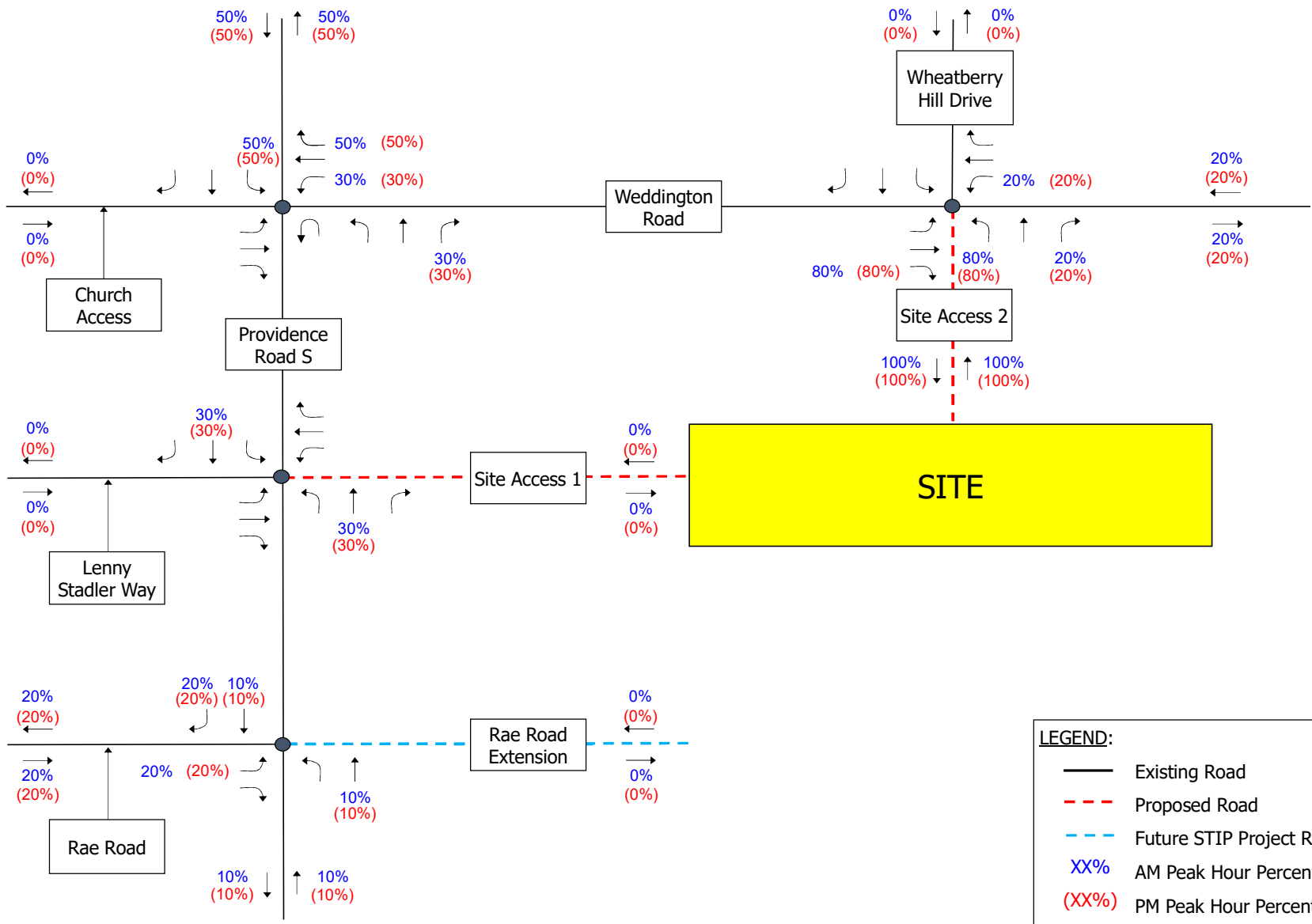
As outlined in the scoping document (see **Appendix A**), proposed high, middle, and elementary school bell schedules will be separated by forty-five (45) minutes. As such, no school trips were included as background for another school during the Build analyses.

## 4.2 TRIP DISTRIBUTION

All parents and (high school) student drivers will enter and exit the site to/from Weddington Road via Site Access 2. All buses and faculty / staff will enter and exit the subject site to/from Providence Road S via Site Access 1. Proposed high school, middle school, and elementary school on-site traffic operations are shown in **Figures 7-3, 7-4, and 7-5**, respectively. For the high school, there is approximately 2,800 feet of on-site queue storage (combination of double and single stack queuing south of the on-site roundabout). With a projected 2,751-foot MSTA queue length for high demand days, adequate on-site storage will be available for queued vehicles. For the middle school, there is approximately 2,800 feet of on-site queue storage (combination of double and single stack queuing south of the on-site roundabout). With a projected 2,769-foot MSTA queue length for high demand days, adequate on-site storage is projected to be available for queued vehicles. For the elementary school, there is approximately 2,478 feet of on-site queue storage (combination of double and single stack queuing south of the short-term parking access). With a projected 2,221 feet MSTA queue length for high demand days, adequate on-site storage is projected to be available for queued vehicles.

The site generated traffic directional traffic patterns, or trip distribution, was determined based on existing traffic patterns and Engineering judgement. The percentages were routed, via shortest path, to and from the proposed development. The following was determined for approaching / departing trips during the analyzed AM and PM peak periods: (1) 50% to/from Providence Road S north of the proposed development, (2) 20% to/from Weddington Road west of the proposed development, (3) 20% to/from Rae Road east of the proposed development, and (4) 10% to/from Providence Road S south of the proposed development (trip distribution percentages were approved by NCDOT and provided in **Appendix A**). The trip distribution percentages were applied to the generated trips to predict routes and project traffic volumes for the school build-out scenarios. **Figure 4-1a** shows the trip distribution percentages for parents and student drivers. **Figure 4-1b** shows the trip distribution percentages for the buses and faculty / staff. **Figures 4-2a, 4-3a, and 4-4a** show the high school, middle school, and elementary school parent trip distribution volumes, respectively. **Figures 4-2b, 4-3b, and 4-4b** show the high school, middle school, and elementary school faculty / staff trip distribution volumes, respectively. **Figures 4-2c, 4-3c, and 4-4c** show the high school, middle school, and elementary school bus trip distribution volumes, respectively. **Figure 4-2d** shows the high school student driver trip distribution volumes. **Figures 4-2e, 4-3d, and 4-4d** show the combined high school, middle school, and elementary school trip distribution volumes, respectively. Build traffic volumes were determined by applying the total site trip distribution volumes to the Background traffic volumes (see **Figures 3-1, 3-2, and 3-3** for the high school, middle school, and elementary school, respectively). The 2026 high school, 2028 middle school, and 2031 elementary school Build traffic volumes are shown in **Figures 5-1, 5-2, and 5-3**, respectively.

School traffic management plans (TMPs) and TMP figures for each school are in **Appendix G**. The document thoroughly describes and depicts each school's onsite traffic flow.



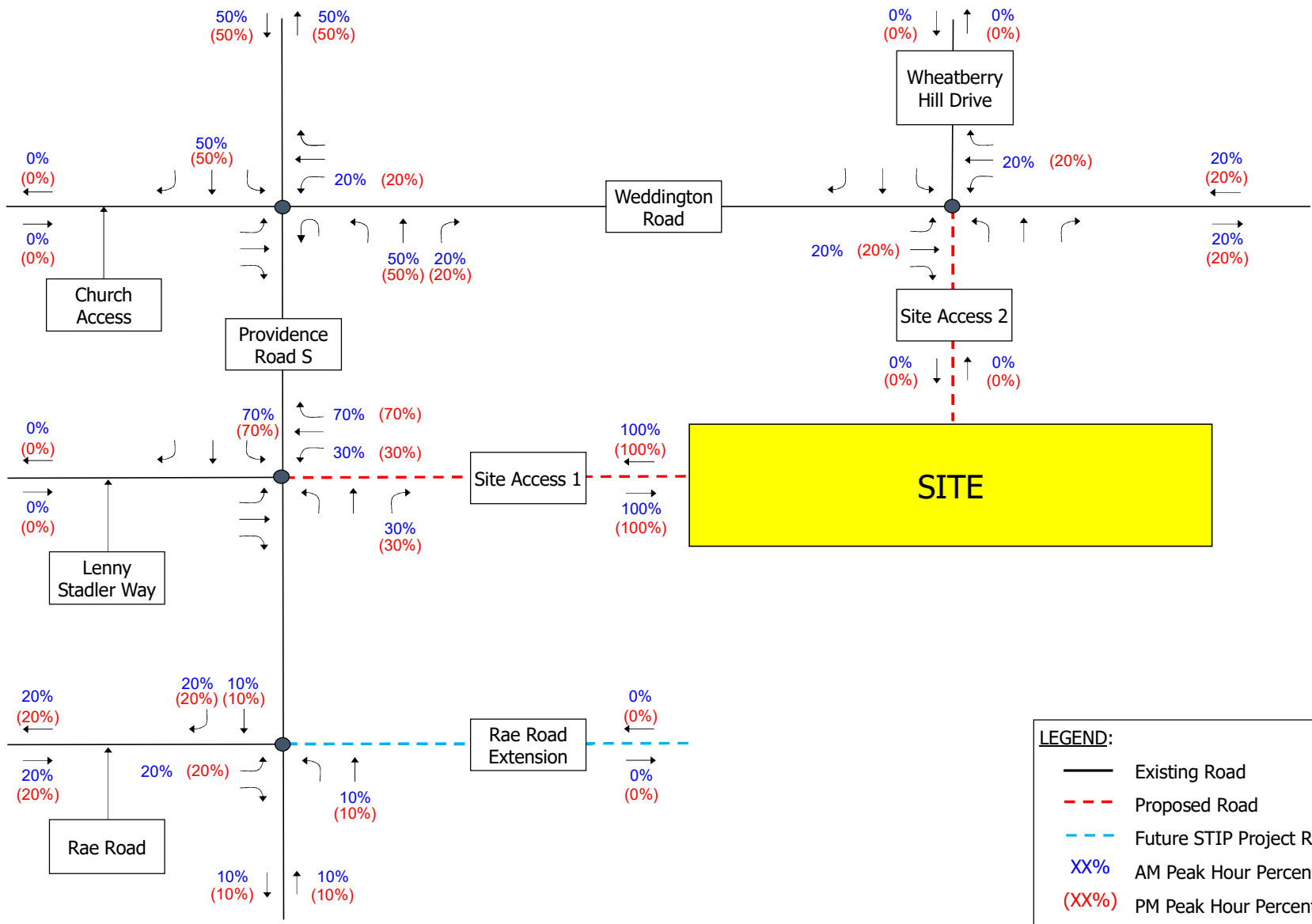
**LEGEND:**

- Existing Road
- - - Proposed Road
- - - Future STIP Project Road
- XX% AM Peak Hour Percentages
- (XX%) PM Peak Hour Percentages



**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 Trip Distribution Percentages -  
 Parents / Student Drivers

Figure 4-1a



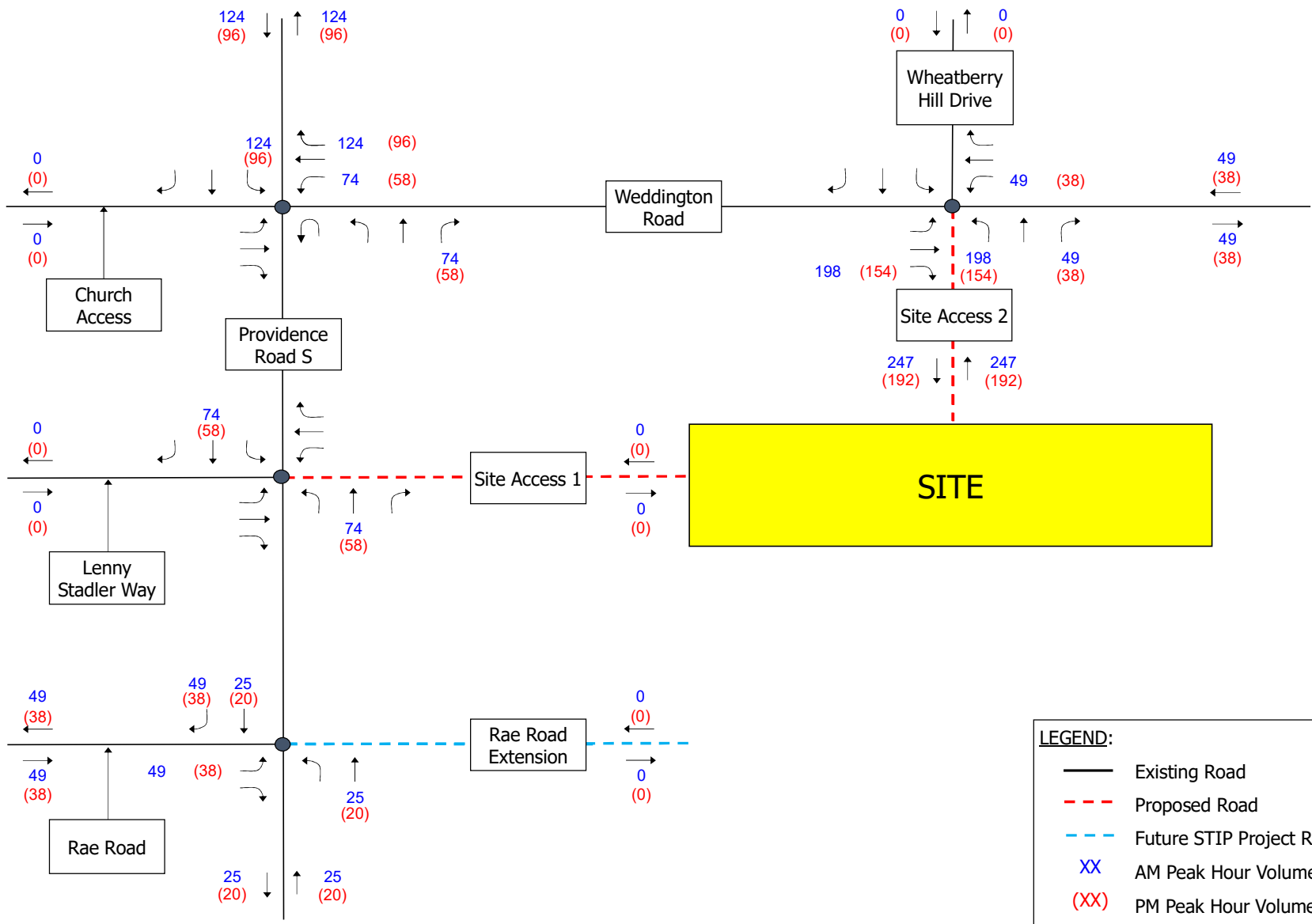
**LEGEND:**

- Existing Road
- - - Proposed Road
- - - Future STIP Project Road
- XX% AM Peak Hour Percentages
- (XX%) PM Peak Hour Percentages



**Liberty Classical Academy  
Traffic Impact Analysis**  
Trip Distribution Percentages -  
Buses / Staff

Figure 4-1b



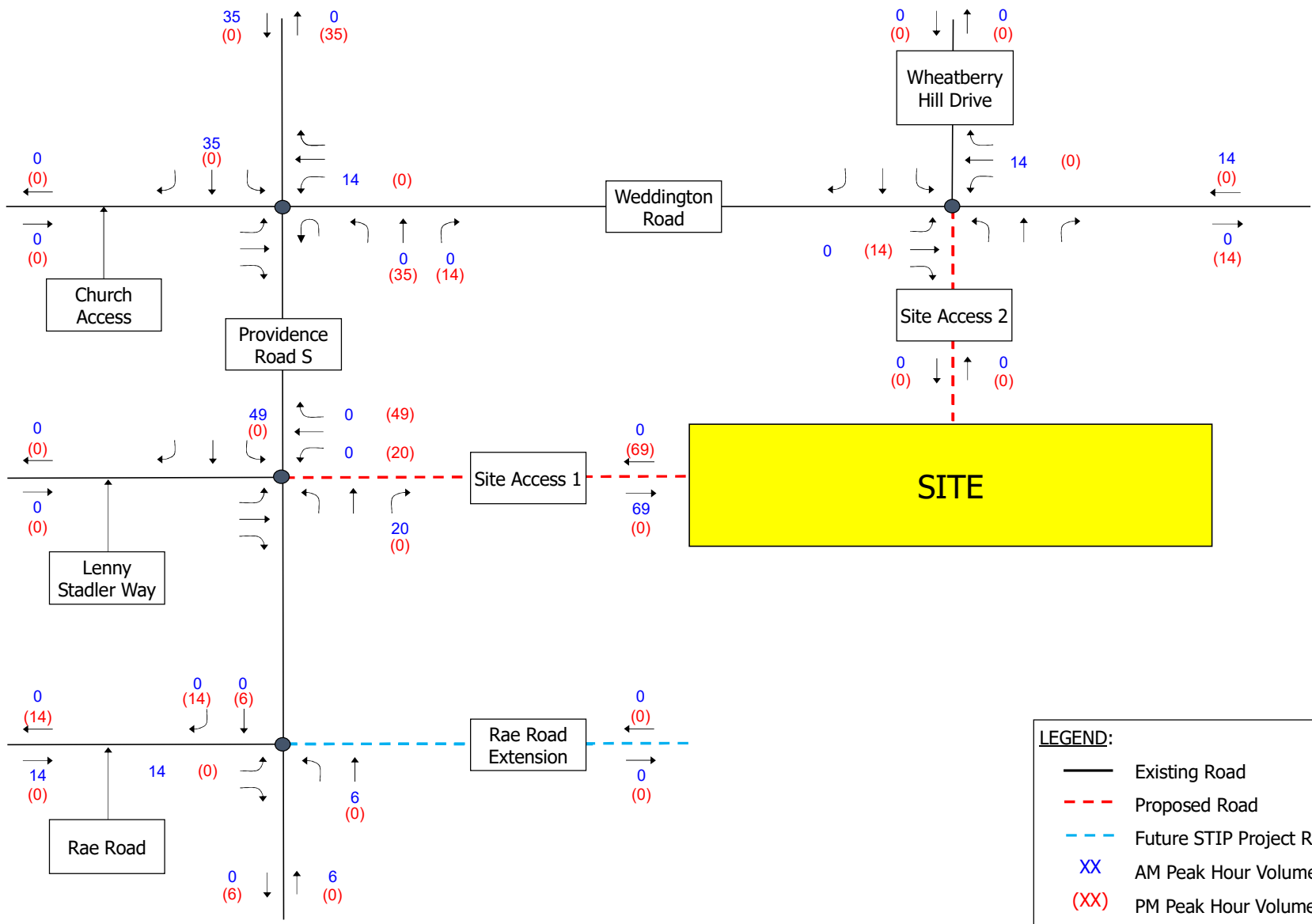
**LEGEND:**

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



**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 High School Trip Distribution Volumes -  
 Parents

Figure 4-2a



**LEGEND:**

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

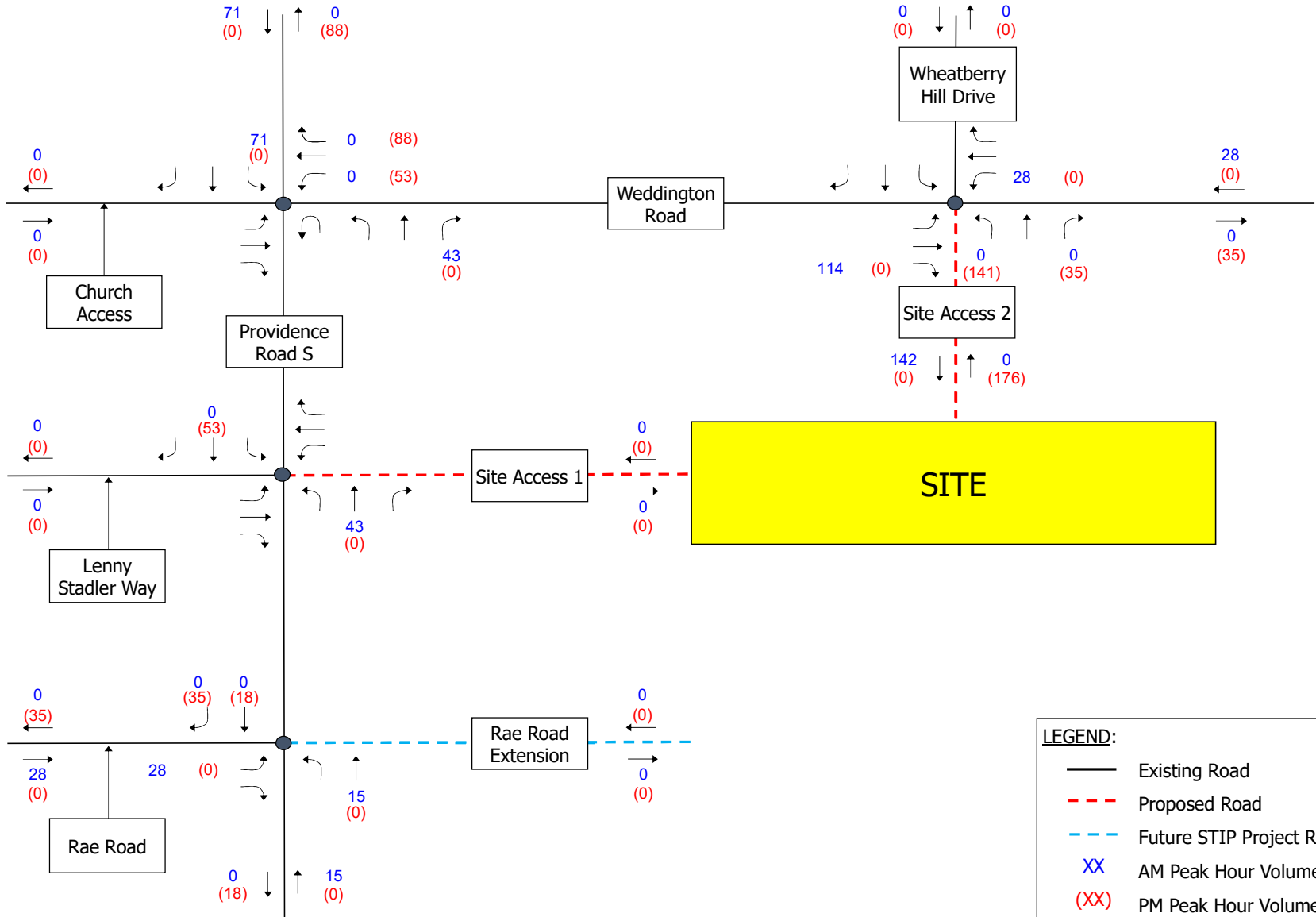


**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 High School Trip Distribution Volumes -  
 Staff

Figure 4-2b





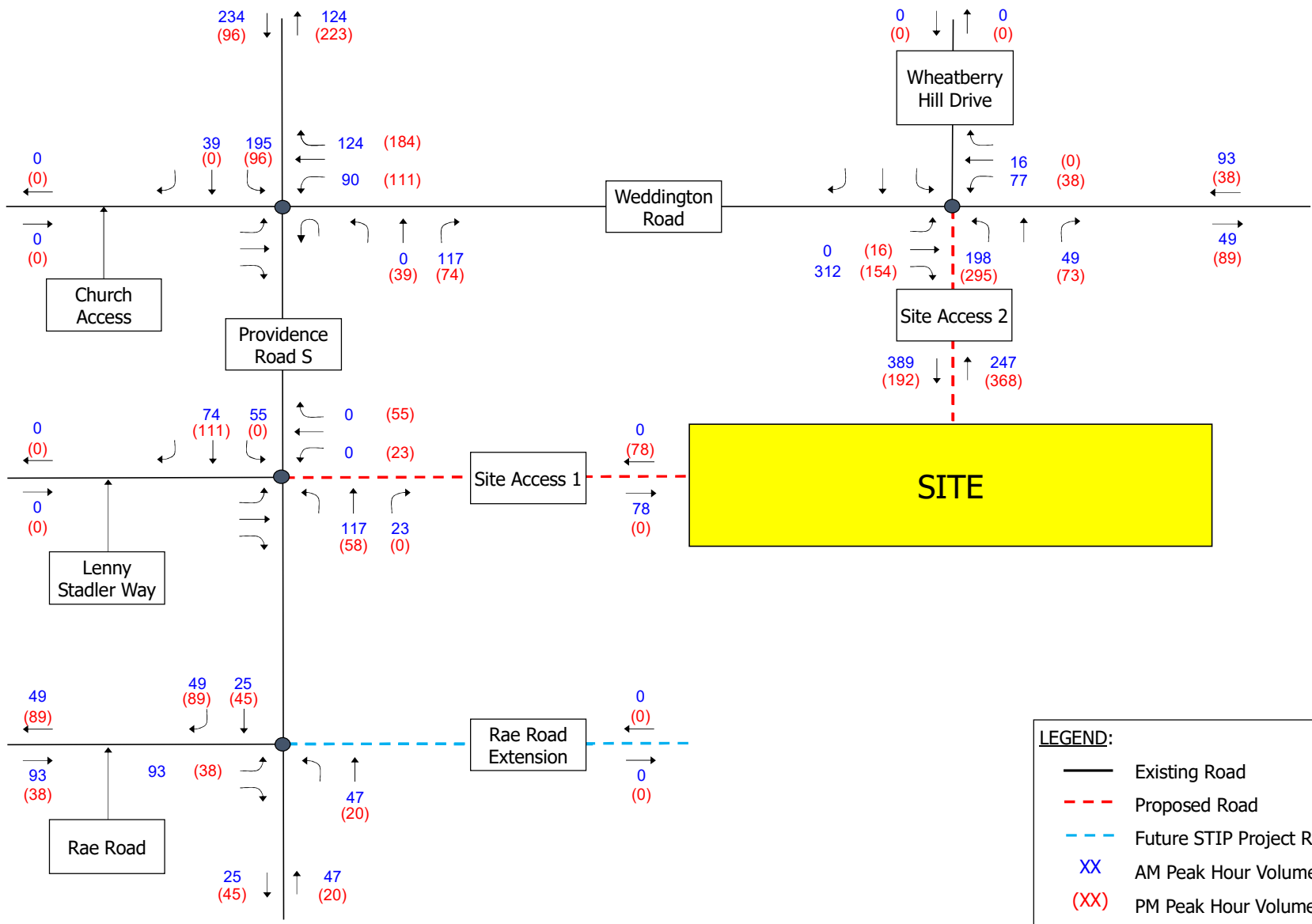


LEGEND:	
	Existing Road
	Proposed Road
	Future STIP Project Road
<b>XX</b>	AM Peak Hour Volume (vph)
<b>(XX)</b>	PM Peak Hour Volume (vph)



**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 Trip Distribution Volumes -  
 Student Drivers

Figure 4-2d



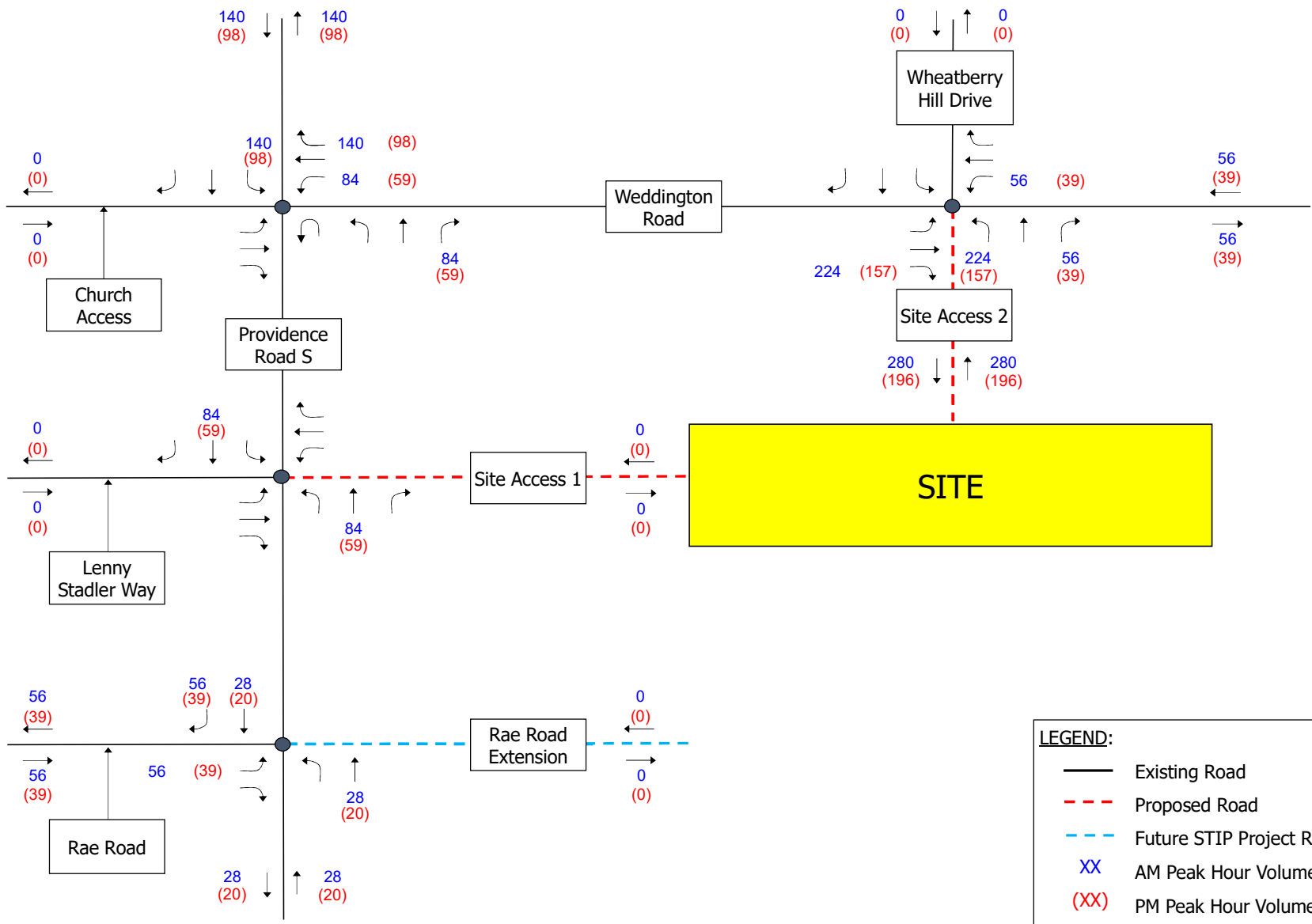
**LEGEND:**

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



**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 High School Combined Trip Distribution Volumes

Figure 4-2e



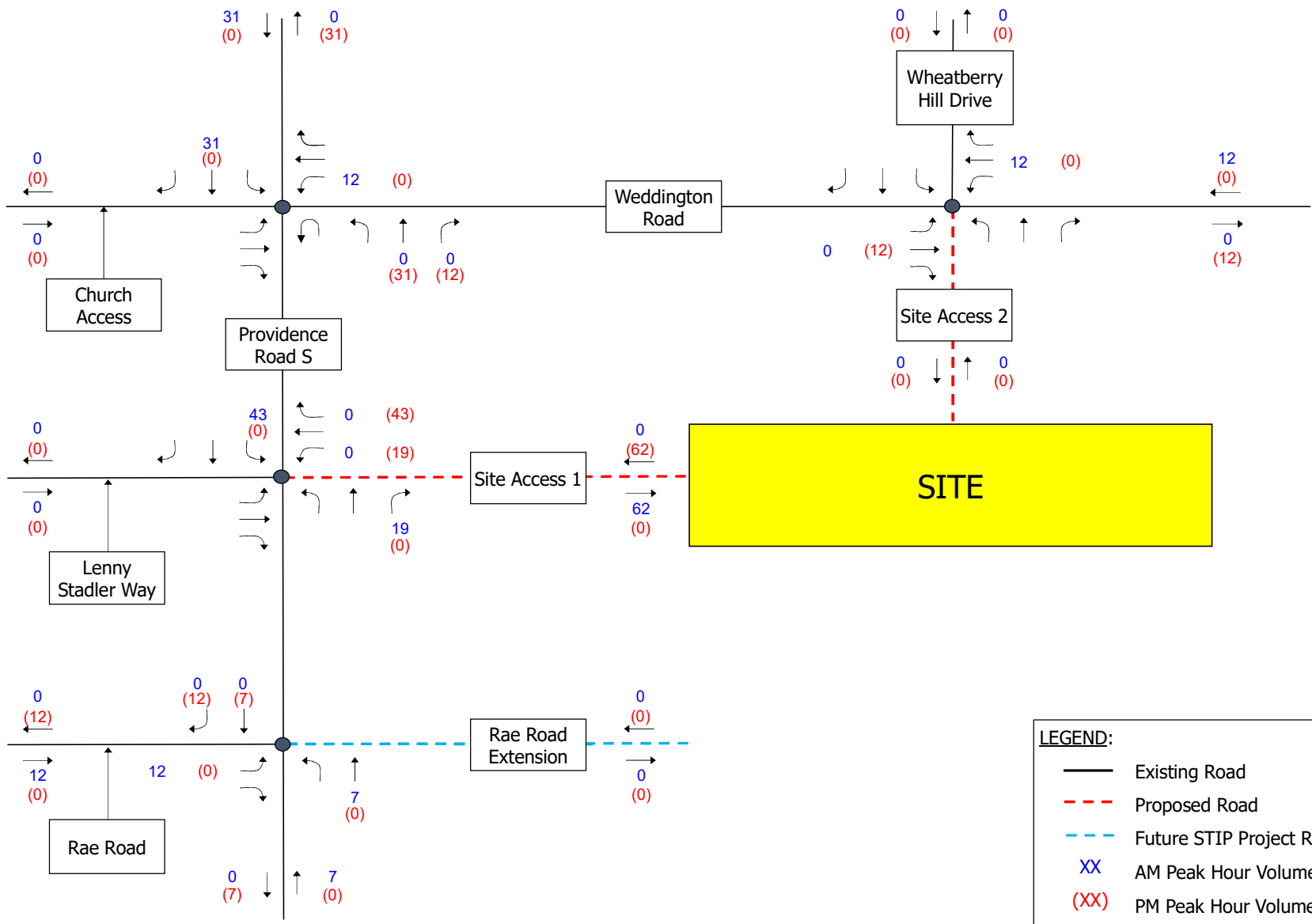
**LEGEND:**

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



**Liberty Classical Academy  
Traffic Impact Analysis**  
Middle School Trip Distribution Volumes -  
Parents

Figure 4-3a



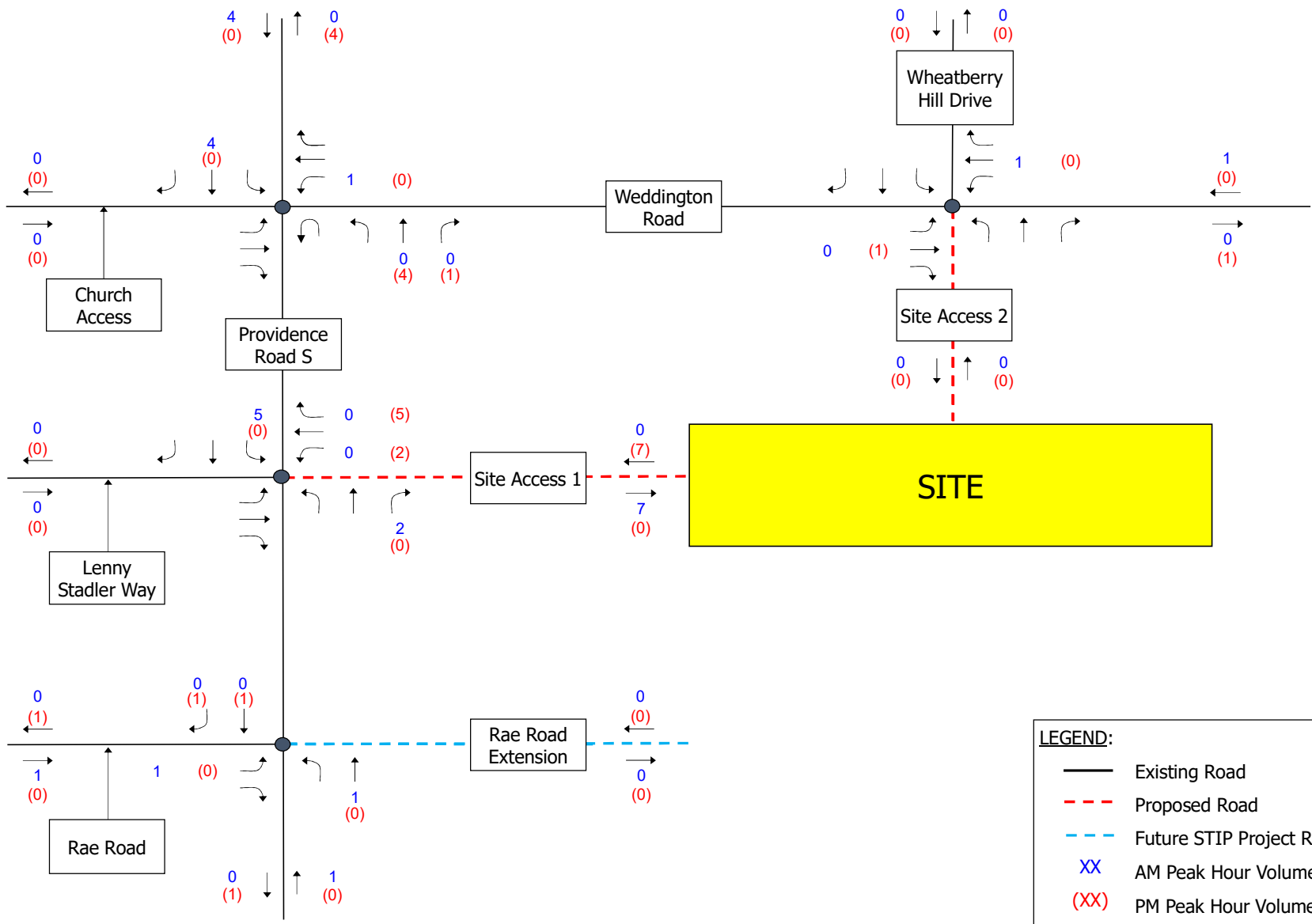
**LEGEND:**

- Existing Road
- - - Proposed Road
- . - . - Future STIP Project Road
- XX AM Peak Hour Volume (vph)
- (XX) PM Peak Hour Volume (vph)



**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 Middle School Trip Distribution Volumes -  
 Staff

Figure 4-3b



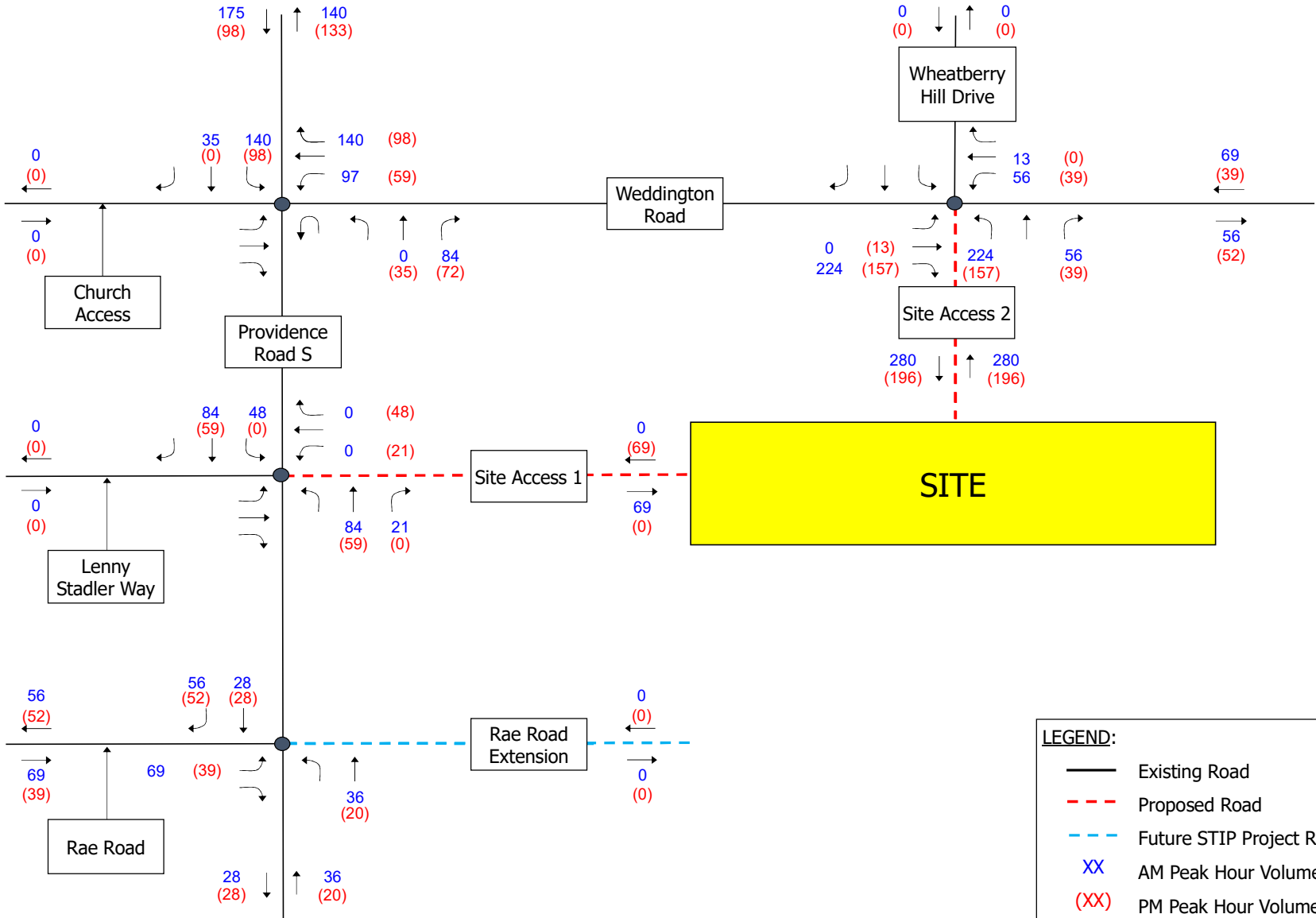
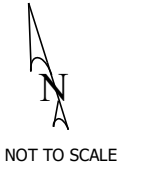
**LEGEND:**

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



**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 Middle School Trip Distribution Volumes -  
 Buses

Figure 4-3c



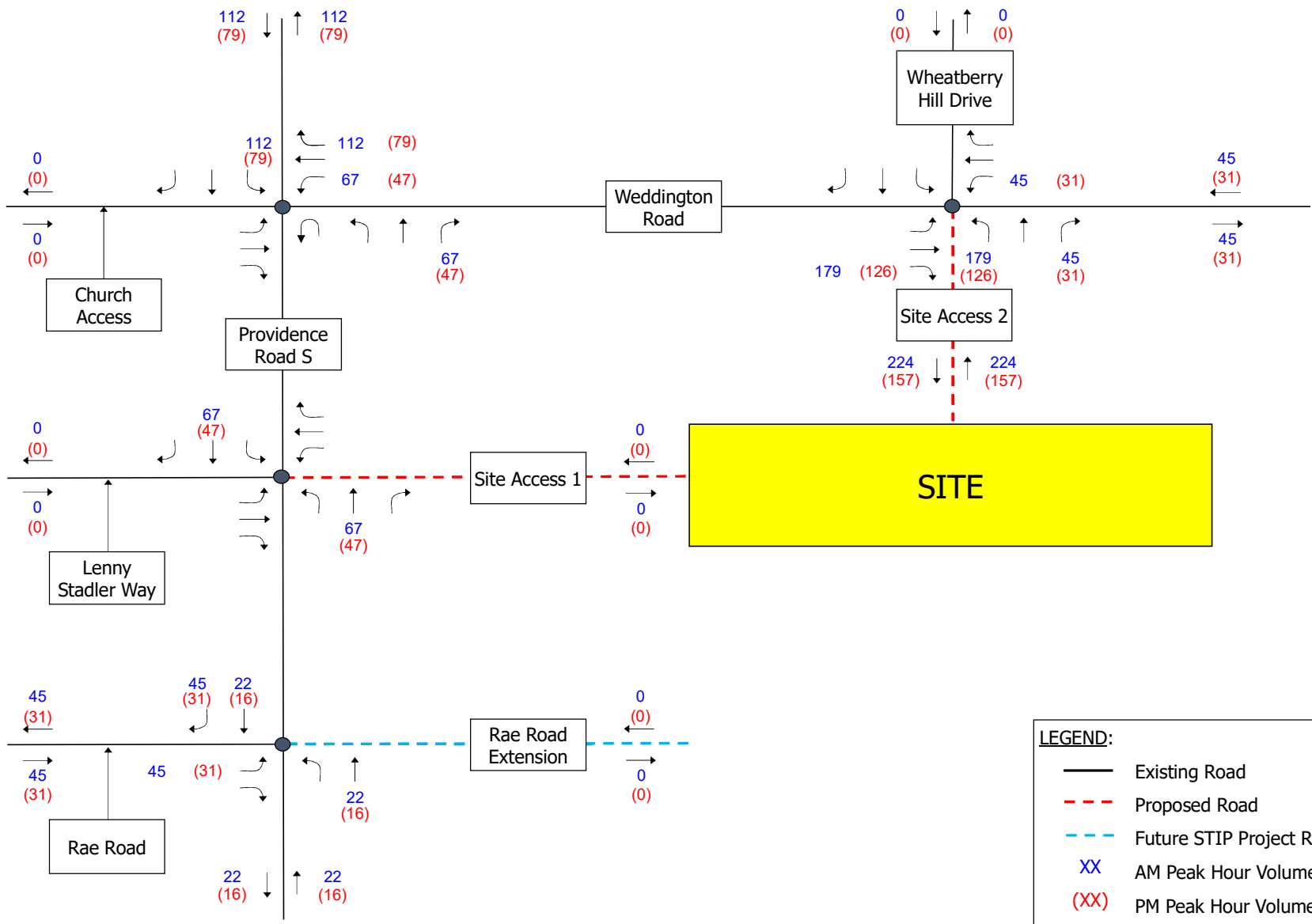
**LEGEND:**

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



**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 Middle School Combined Trip Distribution Volumes

Figure 4-3d



**LEGEND:**

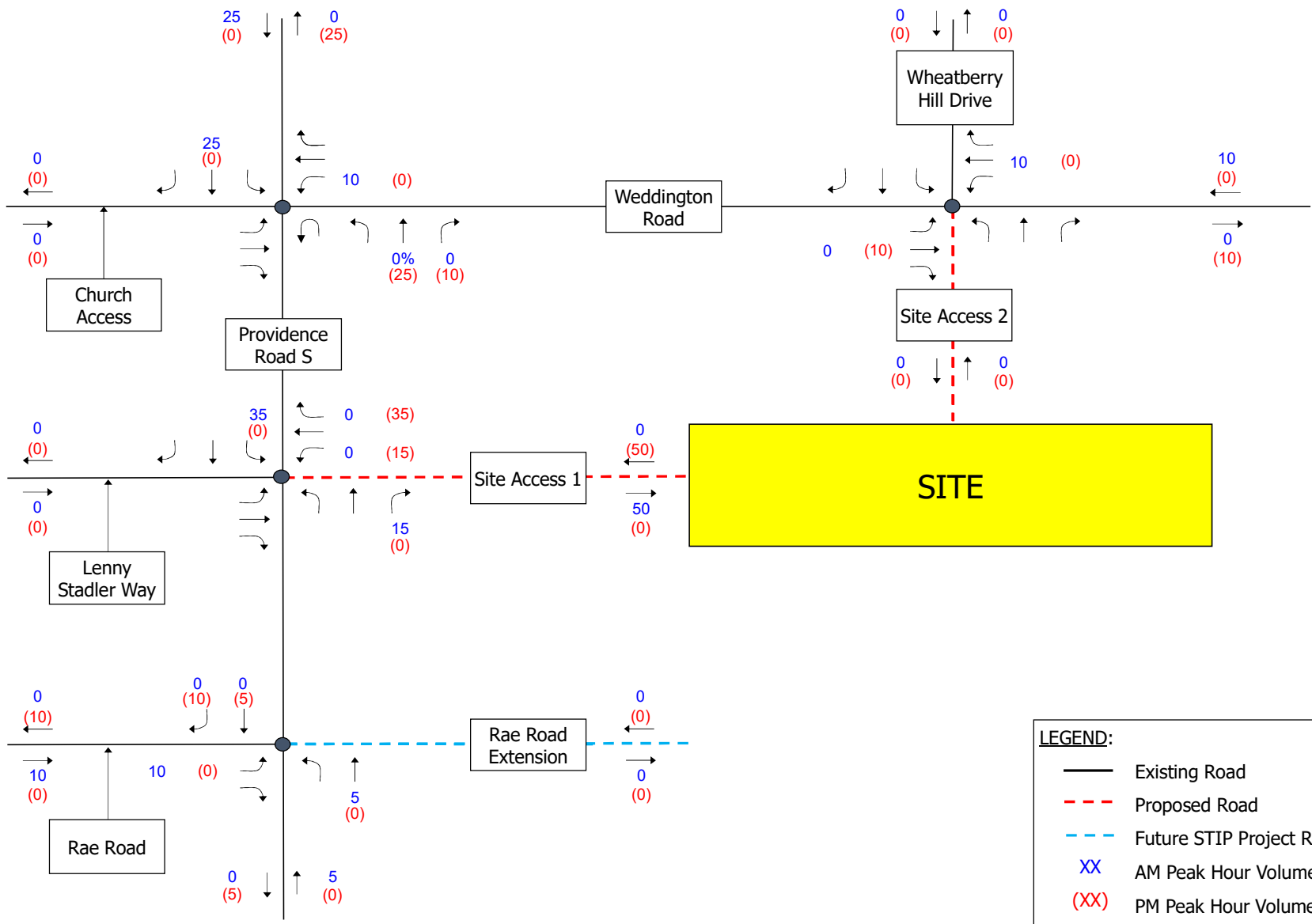
- Existing Road
- - - Proposed Road
- - - Future STIP Project Road
- XX AM Peak Hour Volume (vph)
- (XX) PM Peak Hour Volume (vph)



**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 Elementary School Trip Distribution Volumes -  
 Parents

Figure 4-4a





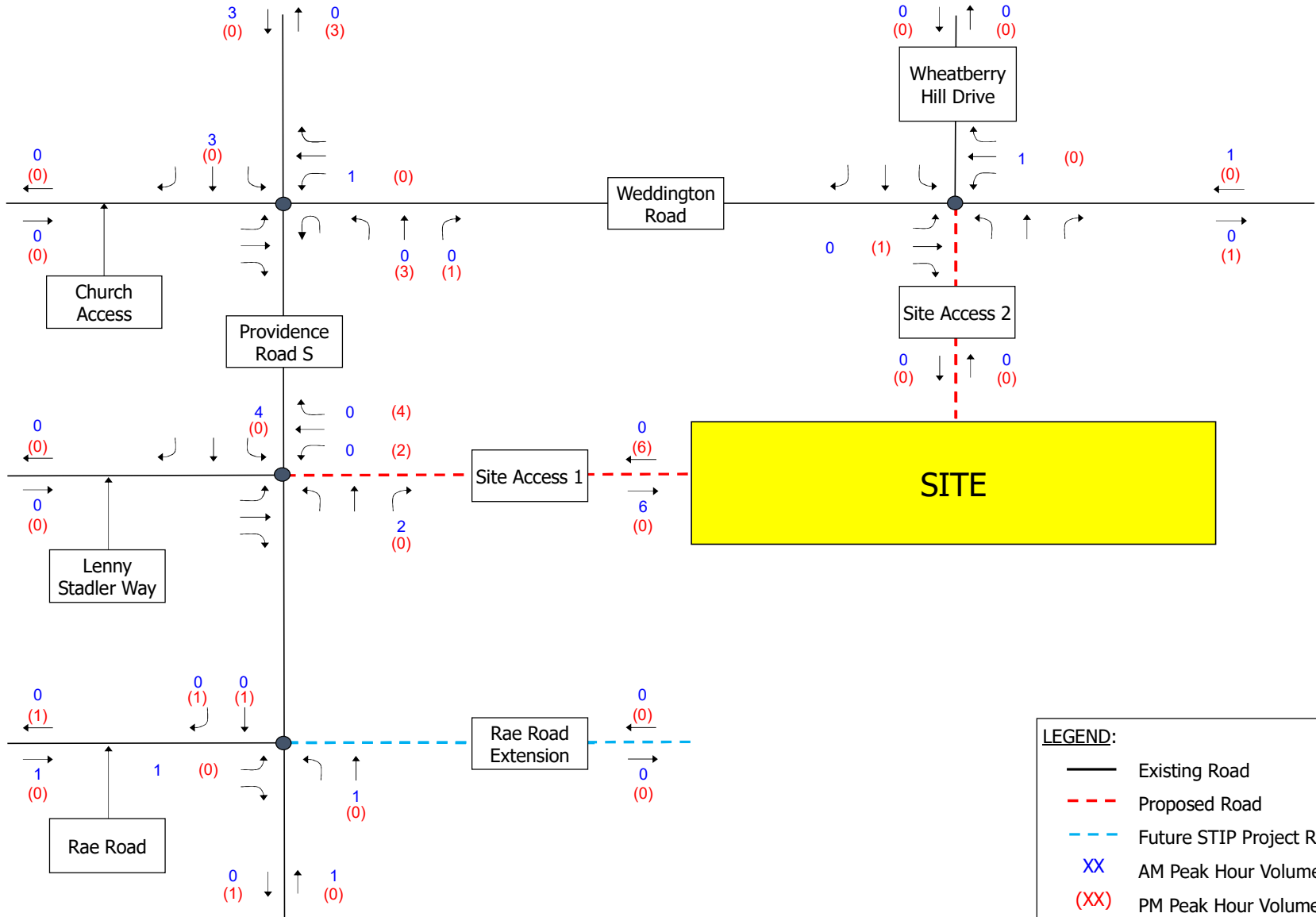
**LEGEND:**

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



**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 Elementary School Trip Distribution Volumes -  
 Staff

Figure 4-4b

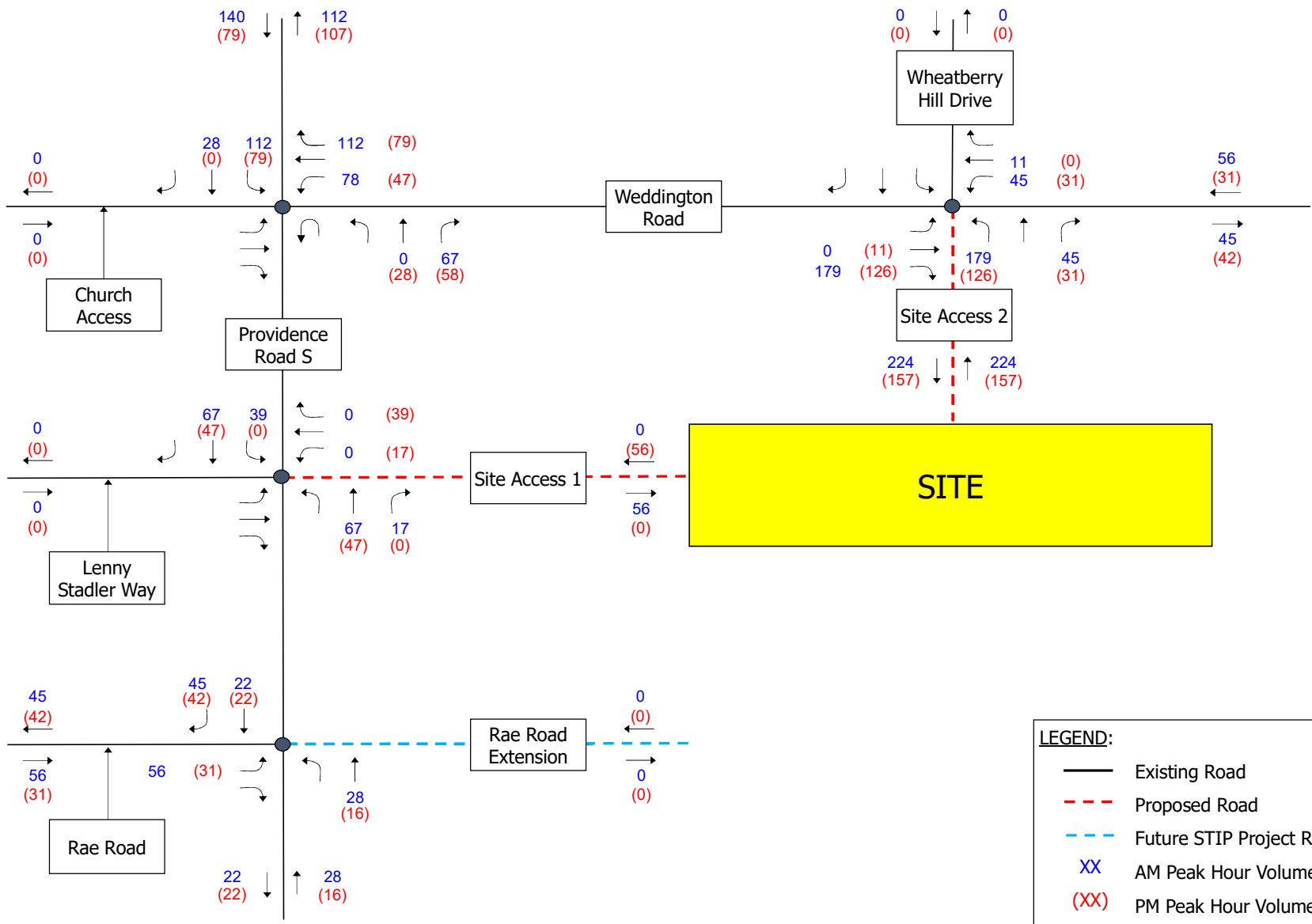


LEGEND:	
	Existing Road
	Proposed Road
	Future STIP Project Road
	AM Peak Hour Volume (vph)
	PM Peak Hour Volume (vph)



**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 Elementary School Trip Distribution Volumes -  
 Buses

Figure 4-4c



**LEGEND:**

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



**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 Elementary School Combined Trip Distribution Volumes

Figure 4-4d

## 5 BUILD CONDITION AND ANALYSIS

To complete the Build analyses (including school site traffic), the estimated school site trips were added to their respective Background traffic volumes. As mentioned earlier, each school was analyzed separately with no overlap (due to the proposed bell spacing). The projected total volumes, along with the existing intersection geometry, were used to complete the capacity analyses.

### 5.1 BUILD TRAFFIC VOLUMES

The 2026 Background traffic volumes (**Figure 3-1**) were added to the projected high school site trips (**Figure 4-2e**) to generate the 2026 Build (High School) traffic volumes (**Figure 5-1**). The 2028 Background traffic volumes (**Figure 3-2**) were added to the projected middle school site trips (**Figure 4-3d**) to generate the 2028 Build (Middle School) traffic volumes (**Figure 5-2**). The 2031 Background traffic volumes (**Figure 3-3**) were added to the projected elementary school site trips (**Figure 4-4d**) to generate the 2031 Build (Elementary School) traffic volumes (**Figure 5-3**).

To summarize, the Build traffic volumes shown on **Figures 5-1, 5-2, and 5-3** contain the following:

- Existing 2023 turning movement traffic count volumes grown exponentially at a 2.5% ambient growth rate; and
- Site trips generated by the subject development (high school, middle school, and elementary school, respectively).

### 5.2 2026 BUILD ANALYSIS (HIGH SCHOOL)

**Table 5-1** summarizes the intersection LOS, delay, 95<sup>th</sup> percentile queue lengths, and SimTraffic Max Queue Length based on the 2026 High School Build traffic volumes (**Figure 5-1**).

The signalized intersection of Providence Road S / Church Parking Lot / Weddington Road is projected to operate at an overall LOS D during both 2026 Build peak hours. The eastbound approach is projected to operate unacceptably during both peak hours. The westbound approach is projected to operate unacceptably during the AM peak hour. All remaining approaches are projected to operate at a LOS D or better. Because the overall intersection is projected to operate acceptably and queue lengths can successfully be stored in available turn-lanes, no improvements are recommended at this intersection due to the proposed development's construction.

The signalized intersection of Providence Road S / Lenny Stadler Way / Site Access 1 is projected to operate at an overall LOS B during both 2026 Build peak hours. All approaches are projected to operate at a LOS C or better. To accommodate the construction of Site Access 1, a 100-foot northbound right-turn lane (with appropriate taper) and a 100-foot southbound left-turn lane (with appropriate taper) is recommended (see **Figure 7-1**). Following these improvements, the intersection is projected to operate at an overall LOS A and B during the AM and PM peak hours, respectively, and all approaches are projected to operate at a LOS D or better (see **Table 5-2**). No additional improvements are recommended at this intersection due to the proposed development's construction.

The signalized intersection of Providence Road S / Rae Road is projected to operate at an overall LOS D during both 2026 Build peak hours. The eastbound approach is projected to operate unacceptably during the PM peak hour. All remaining approaches are projected to operate at a LOS D or better. Because the overall intersection is projected to operate acceptably and queue lengths can successfully be stored in available turn-lanes, no improvements are recommended at this intersection due to the proposed

development's construction. Additionally (as described in **Section 3** above), two STIP projects (U-5769B and U-3467) are planned at this intersection to add additional capacity to each intersection approach.

The north and southbound Site Access 2 / Wheatberry Hill Drive / Weddington Road unsignalized intersection approaches are projected to operate unacceptably during both 2026 Build peak hours. All remaining approaches are projected to operate at a LOS A during both peak hours. To mitigate capacity concerns, it is recommended that the intersection be signalized\*. Additionally, construction of a 100-foot westbound left-turn lane (with appropriate taper) and a 150-foot eastbound channelized right-turn lane (with appropriate taper) is recommended (see **Figure 7-1**). Following these improvements, the intersection is projected to operate at an overall LOS C and D during the AM and PM peak hours, respectively, and all approaches are projected to operate at a LOS D or better (see **Table 5-2**). No additional improvements are recommended at this intersection due to the proposed development's construction.

\* Current plans call for the high school and middle school to initially open at partial student capacity. To be conservative, the TIA analyses assumed full high school and middle school student capacities. At full capacity, the subject intersection is projected to meet FHWA signal volume warrants. It is recommended that the intersection be monitored, and the proposed signal be installed when these volume warrants are met. Until such time, the intersection should be controlled by a police officer (hired by the school) during school unloading / loading operation times.

**Table 5-1: Intersection Level of Service, Delay and 95<sup>th</sup> Percentile Queue Summary  
2026 Build (High School) Traffic Volumes**

Intersection	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR			
			Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)
1: Providence Road S & Church Parking Lot/Weddington Road	EB Left/Thru/Right		<b>130.9</b>	<b>F</b>	#173	148	<b>56.0</b>	<b>E</b>	45	58
	EB Approach		<b>130.9</b>	<b>F</b>	--	--	<b>56.0</b>	<b>E</b>	--	--
	WB Left	550	<b>93.4</b>	<b>F</b>	#381	130	<b>70.2</b>	<b>E</b>	#295	167
	WB Left/Thru		<b>96.3</b>	<b>F</b>	#444	140	<b>71.8</b>	<b>E</b>	#380	183
	WB Right	325	<b>66.0</b>	<b>E</b>	#532	232	37.2	D	#398	267
	WB Approach		<b>79.6</b>	<b>E</b>	--	--	51.3	D	--	--
	NB Left	550	<b>55.4</b>	<b>E</b>	39	58	52.8	D	15	26
	NB Thru		<b>55.8</b>	<b>E</b>	#592	550	49.3	D	#464	403
	NB Right	450	18.0	B	216	350	22.7	C	341	344
	NB Approach		45.5	D	--	--	40.2	D	--	--
	SB Dual Lefts	450	52.5	D	246	335	36.9	D	264	300
	SB Thru/Right		16.3	B	251	181	12.7	B	330	174
	SB Approach		32.4	C	--	--	22.2	C	--	--
	Overall			52.7	D	--	--	36.6	D	--
2: Providence Road S & Lenny Stadler Way/Site Access 1	EB Left/Thru		37.7	D	32	91	30.6	C	31	61
	EB Right	50	25.1	C	35	61	21.3	C	31	49
	EB Approach		32.9	C	--	--	27.4	C	--	--
	WB Left/Thru		34.8	C	14	42	32.2	C	33	16
	WB Right	425	33.8	C	9	35	33.9	C	57	58
	WB Approach		34.4	C	--	--	33.4	C	--	--
	NB Left	325	4.4	A	20	126	5.0	A	16	62
	NB Thru/Right		4.1	A	216	453	6.1	A	199	160
	NB Approach		4.1	A	--	--	6.1	A	--	--
	SB Left/Thru/Right		22.2	C	#544	371	14.1	B	382	192
	SB Approach		22.2	C	--	--	14.1	B	--	--
	Overall			12.9	B	--	--	11.8	B	--
3: Providence Road S & Rae Road	EB Left		<b>68.7</b>	<b>E</b>	#452	469	<b>99.9</b>	<b>F</b>	#636	1010
	EB Right		14.6	B	122	133	26.2	C	256	638
	EB Approach		53.0	D	--	--	<b>72.8</b>	<b>E</b>	--	--
	NB Dual Lefts	450	<b>73.0</b>	<b>E</b>	#212	254	<b>80.9</b>	<b>F</b>	#158	218
	NB Thru		13.9	B	267	242	11.7	B	187	194
	NB Approach		28.8	C	--	--	27.0	C	--	--
	SB Thru		52.1	D	#583	417	<b>81.5</b>	<b>F</b>	#977	862
	SB Right		4.6	A	99	141	3.4	A	87	619
	SB Approach		33.1	C	--	--	54.2	D	--	--
	Overall			35.5	D	--	--	50.6	D	--
4: Site Access 2/Wheatberry Hill Drive & Weddington Road	EB Left	125	9.6	A	0	5	8.8	A	0	51
	EB Thru/Right		0.0	A	0	319	0.0	A	0	495
	EB Approach		0.0	A	--	--	0.1	A	--	--
	WB Left/Thru		0.0	A	0	1226	0.0	A	0	897
	WB Right	125	0.0	A	0	157	0.0	A	0	178
	WB Approach		1.9	A	--	--	1.2	A	--	--
	NB Left/Thru/Right		<b>7885.2</b>	<b>F</b>	62.3	1056	<b>4821.1</b>	<b>F</b>	88	1052
	NB Approach		<b>7885.2</b>	<b>F</b>	--	--	<b>4821.1</b>	<b>F</b>	--	--
	SB Left/Thru/Right		<b>212.2</b>	<b>F</b>	2.4	268	<b>142.9</b>	<b>F</b>	2.5	238
SB Approach		<b>212.2</b>	<b>F</b>	--	--	<b>142.9</b>	<b>F</b>	--	--	

<sup>1</sup> Overall intersection LOS and delay not reported for TWSC intersections.

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

**Table 5-2: Intersection Level of Service, Delay and 95<sup>th</sup> Percentile Queue Summary 2026 Build + Improvements (High School) Traffic Volumes**

Intersection	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR			
			Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95 <sup>th</sup> Percentile Queue Length	Sim Traffic Max Queue Length (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95 <sup>th</sup> Percentile Queue Length	Sim Traffic Max Queue Length (ft)
2: Providence Road S & Lenny Stadler Way/Site Access 1	EB Left/Thru		34.7	C	32	75	30.3	C	31	90
	EB Right	50	24.1	C	35	55	21.0	C	31	52
	EB Approach		30.7	C	--	--	27.0	C	--	--
	WB Left/Thru		34.2	C	14	35	31.9	C	33	82
	WB Right	425	33.5	C	9	31	33.6	C	57	108
	WB Approach		34.0	C	--	--	33.0	C	--	--
	NB Left	325	3.9	A	20	70	5.0	A	16	70
	NB Thru/Right		4.1	A	216	212	6.2	A	199	182
	NB Approach		4.1	A	--	--	6.2	A	--	--
	SB Left	100	25.3	C	34	159	8.0	A	4	42
	SB Thru/Right		8.9	A	257	214	13.1	B	360	291
	SB Approach		10.2	B	--	--	13.1	B	--	--
Overall			7.7	A	--	--	11.3	B	--	--
4: Site Access 2/Wheatberry Hill Drive & Weddington Road	EB Left	125	10.0	A	7	26	15.7	B	15	147
	EB Thru		13.0	B	189	243	49.0	D	#575	898
	EB Right	150	0.7	A	0	238	0.3	A	0	250
	EB Approach		5.9	A	--	--	34.7	C	--	--
	WB Left	100	14.2	B	37	200	79.8	E	39	199
	WB Thru		30.0	C	#546	588	28.0	C	380	426
	WB Right	125	8.4	A	8	116	13.5	B	13	35
	WB Approach		27.4	C	--	--	33.4	C	--	--
	NB Left/Thru		46.5	D	127	292	62.5	E	171	439
	NB Right	100	18.6	B	35	188	14.2	B	41	200
	NB Approach		41.1	D	--	--	53.0	D	--	--
	SB Left/Thru/Right		17.2	B	13	51	12.8	B	13	52
	SB Approach		17.3	B	--	--	12.8	B	--	--
	Overall			21.1	C	--	--	39.4	D	--

<sup>1</sup> Overall intersection LOS and delay not reported for TWSC intersections.

\* - 95<sup>th</sup> percentile queues for unsignalized intersections reported in number of vehicles.

**5.3 2028 BUILD ANALYSIS (MIDDLE SCHOOL)**

**Table 5-3** summarizes the intersection LOS, delay, 95<sup>th</sup> percentile queue lengths, and SimTraffic Max Queue Length based on the 2028 Middle School Build traffic volumes (shown on **Figure 5-2**).

The signalized intersection of Providence Road S / Church Parking Lot / Weddington Road is projected to operate at an overall LOS E and C during the 2028 Build AM and PM peak hours, respectively. The eastbound approach is projected to operate unacceptably during both peak hours. The west and northbound approaches are projected to operate unacceptably during the AM peak hour. All remaining approaches are projected to operate at a LOS D or better. Currently this intersection includes turn-lanes in all approaches with lengthy storage. Each intersection quadrant includes viable businesses or developments constructed in close proximity to the roadway. Any recommended geometric improvements would significantly impact existing area development. Because of this, no improvements are recommended at this intersection due to the proposed development’s construction.

The signalized intersection of Providence Road S / Lenny Stadler Way / Site Access 1 is projected to operate at an overall LOS B during both 2028 Build peak hours. All approaches are projected to operate at a LOS C or better. Following the improvements discussed in **Section 5.1** (shown in **Figure 7-1**), the intersection is projected to operate at an overall LOS A and B during the AM and PM peak hours,

respectively. All approaches are projected to operate at a LOS D or better (see **Table 5-4**). No additional improvements are recommended at this intersection due to the proposed development's construction.

The signalized intersection of Providence Road S / Rae Road is projected to operate at an overall LOS D and E during the 2028 Build AM and PM peak hours, respectively. The east and southbound approaches are projected to operate unacceptably during the PM peak hour. All remaining approaches are projected to operate at a LOS D or better. As described in **Section 3** above), two STIP projects (U-5769B and U-3467) are planned at this intersection to add additional capacity to each intersection approach. Additionally, queue lengths can successfully be stored in available turn-lanes. Because of these factors, no improvements are recommended at this intersection due to the proposed development's construction.

The north and southbound Site Access 2 / Wheatberry Hill Drive / Weddington Road unsignalized intersection approaches are projected to operate unacceptably during both 2028 Build peak hours. All remaining approaches are projected to operate at a LOS A during both peak hours. Following the improvements discussed in **Section 5.1** (shown in **Figure 7-1**), this intersection is projected to operate at an overall LOS C and B during the AM and PM peak hours, respectively. All approaches are projected to operate at a LOS D or better (see **Table 5-4**). No additional improvements are recommended at this intersection due to the proposed development's construction.



**Table 5-3: Intersection Level of Service, Delay and 95<sup>th</sup> Percentile Queue Summary  
2028 Build (Middle School) Traffic Volumes**

Intersection	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR			
			Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)
1: Providence Road S & Church Parking Lot/Weddington Road	EB Left/Thru/Right		<b>146.3</b>	<b>F</b>	#183	151	<b>55.1</b>	<b>E</b>	46	60
	EB Approach		<b>146.3</b>	<b>F</b>	--	--	<b>55.1</b>	<b>E</b>	--	--
	WB Left	550	<b>110.7</b>	<b>F</b>	#408	204	<b>58.9</b>	<b>E</b>	#253	158
	WB Left/Thru		<b>114.7</b>	<b>F</b>	#485	258	<b>59.8</b>	<b>E</b>	#301	197
	WB Right	325	<b>87.7</b>	<b>F</b>	#623	382	30.6	C	343	298
	WB Approach		<b>99.4</b>	<b>F</b>	--	--	42.8	D	--	--
	NB Left	550	<b>55.7</b>	<b>E</b>	41	295	52.5	D	15	25
	NB Thru		<b>69.9</b>	<b>E</b>	#656	792	40.9	D	459	518
	NB Right	450	17.7	B	206	525	19.6	B	334	388
	NB Approach		<b>57.1</b>	<b>E</b>	--	--	33.7	C	--	--
	SB Dual Lefts	450	46.7	D	223	331	43.1	D	291	370
	SB Thru/Right		16.6	B	264	197	13.1	B	355	345
	SB Approach		28.8	C	--	--	24.8	C	--	--
	Overall			<b>63.0</b>	<b>E</b>	--	--	32.4	C	--
2: Providence Road S & Lenny Stadler Way/Site Access 1	EB Left/Thru		37.8	D	34	98	30.5	C	32	80
	EB Right	50	25.2	C	38	61	21.0	C	32	50
	EB Approach		32.9	C	--	--	27.2	C	--	--
	WB Left/Thru		34.6	C	14	49	31.8	C	31	62
	WB Right	425	33.8	C	9	34	32.9	C	51	88
	WB Approach		34.3	C	--	--	32.5	C	--	--
	NB Left	325	52.5	D	#116	107	38.0	D	66	74
	NB Thru/Right		4.2	A	229	437	6.3	A	215	591
	NB Approach		6.7	A	--	--	7.4	A	--	--
	SB Left/Thru/Right		21.3	C	#561	411	13.7	B	390	275
	SB Approach		21.3	C	--	--	13.7	B	--	--
	Overall			14.0	B	--	--	12.0	B	--
3: Providence Road S & Rae Road	EB Left		<b>71.8</b>	<b>E</b>	#459	578	<b>103.5</b>	<b>F</b>	#712	1238
	EB Right		15.2	B	129	149	28.3	C	288	965
	EB Approach		54.4	D	--	--	<b>75.9</b>	<b>E</b>	--	--
	NB Dual Lefts	450	<b>71.1</b>	<b>E</b>	#218	312	<b>107.1</b>	<b>F</b>	#188	234
	NB Thru		13.3	B	274	233	13.4	B	220	212
	NB Approach		28.2	C	--	--	34.1	C	--	--
	SB Thru		<b>58.6</b>	<b>E</b>	#627	516	<b>86.9</b>	<b>F</b>	#1092	1335
	SB Right		5.1	A	112	313	3.0	A	81	1080
	SB Approach		37.1	D	--	--	<b>59.4</b>	<b>E</b>	--	--
	Overall			36.7	D	--	--	<b>55.8</b>	<b>E</b>	--
4: Site Access 2/Wheatberry Hill Drive & Weddington Road	EB Left	125	9.8	A	0	20	8.9	A	0	46
	EB Thru/Right		0.0	A	0	859	0.0	A	0	459
	EB Approach		0.1	A	--	--	0.1	A	--	--
	WB Left/Thru		0.0	A	0	1218	0.0	A	0	1095
	WB Right	125	0.0	A	0	134	0.0	A	0	90
	WB Approach		1.2	A	--	--	1.2	A	--	--
	NB Left/Thru/Right		<b>5533.2</b>	<b>F</b>	68.6	1054	<b>2847.8</b>	<b>F</b>	46.1	1048
	NB Approach		<b>5533.2</b>	<b>F</b>	--	--	<b>2847.8</b>	<b>F</b>	--	--
	SB Left/Thru/Right		<b>121.7</b>	<b>F</b>	1.9	230	<b>120.4</b>	<b>F</b>	2.2	335
	SB Approach		<b>121.7</b>	<b>F</b>	--	--	<b>120.4</b>	<b>F</b>	--	--

<sup>1</sup> Overall intersection LOS and delay not reported for TWSC intersections.

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

**Table 5-4: Intersection Level of Service, Delay and 95<sup>th</sup> Percentile Queue Summary 2028 Build + Improvements (Middle School) Traffic Volumes**

Intersection	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR			
			Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)
2: Providence Road S & Lenny Stadler Way/Site Access 1	EB Left/Thru		32.9	C	34	94	29.9	C	32	76
	EB Right	50	22.8	C	37	61	20.3	C	32	53
	EB Approach		29.0	C	--	--	26.6	C	--	--
	WB Left/Thru		33.0	C	14	50	31.5	C	31	72
	WB Right	425	32.5	C	9	40	32.7	C	51	114
	WB Approach		32.8	C	--	--	32.3	C	--	--
	NB Left	325	40.1	D	#115	191	37.7	D	66	84
	NB Thru/Right		4.4	A	229	476	6.3	A	215	216
	NB Approach		6.3	A	--	--	7.4	A	--	--
	SB Left	100	22.7	C	29	131	8.0	A	4	47
	SB Thru/Right		10.0	B	282	257	12.8	B	366	299
	SB Approach		10.8	B	--	--	12.8	B	--	--
	Overall			9.1	A	--	--	11.5	B	--
4: Site Access 2/Wheatberry Hill Drive & Weddington Road	EB Left	125	11.7	B	9	30	7.5	A	9	37
	EB Thru		14.7	B	219	216	22.9	C	#362	483
	EB Right	150	0.4	A	0	179	0.3	A	0	250
	EB Approach		7.8	A	--	--	16.4	B	--	--
	WB Left	100	13.8	B	31	200	29.2	C	22	110
	WB Thru		37.3	D	#626	765	14.9	B	245	244
	WB Right	125	9.2	A	9	50	6.7	A	8	33
	WB Approach		34.4	C	--	--	16.3	B	--	--
	NB Left/Thru		<b>57.8</b>	<b>E</b>	150	323	34.9	C	87	233
	NB Right	100	19.2	B	40	198	16.1	B	26	163
	NB Approach		50.2	D	--	--	31.2	C	--	--
	SB Left/Thru/Right		17.6	B	14	48	15.4	B	14	44
	SB Approach		17.6	B	--	--	15.4	B	--	--
	Overall			28.0	C	--	--	18.9	B	--

<sup>1</sup> Overall intersection LOS and delay not reported for TWSC intersections.

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

**5.4 2031 BUILD ANALYSIS (ELEMENTARY SCHOOL)**

**Table 5-5** summarizes the intersection LOS, delay, 95<sup>th</sup> percentile queue lengths, and SimTraffic Max Queue Length based on the 2031 Elementary School Build traffic volumes (shown on **Figure 5-3**).

The signalized intersection of Providence Road S / Church Parking Lot / Weddington Road is projected to operate at an overall LOS E and C during the 2031 Build AM and PM peak hours, respectively. The eastbound approach is projected to operate unacceptably during both peak hours. The westbound approach is projected to operate unacceptably during the AM peak hour. All remaining approaches are projected to operate at a LOS D or better. As previously stated, each intersection quadrant includes viable businesses or developments constructed in close proximity to the roadway. Any recommended geometric improvements would significantly impact existing area development. Because of this, no improvements are recommended at this intersection due to the proposed development’s construction.

The signalized intersection of Providence Road S / Lenny Stadler Way / Site Access 1 is projected to operate at an overall LOS B during both 2031 Build peak hours. All approaches are projected to operate at a LOS C or better. Following the improvements discussed in **Section 5.1** (shown in **Figure 7-1**), the intersection is projected to operate at an overall LOS A and B during the AM and PM peak hours, respectively, and all approaches are projected to operate at a LOS C or better (see **Table 5-6**). No

additional improvements are recommended at this intersection due to the proposed development's construction.

The signalized intersection of Providence Road S / Rae Road is projected to operate at an overall LOS D and E during the 2031 Build AM and PM peak hours, respectively. The eastbound and southbound approaches are projected to operate unacceptably during the PM peak hour. All remaining approaches are projected to operate at a LOS D or better. As described in **Section 3** above), two STIP projects (U-5769B and U-3467) are planned at this intersection to add additional capacity to each intersection approach. Additionally, queue lengths can successfully be stored in available turn-lanes. Because of these factors, no improvements are recommended at this intersection due to the proposed development's construction.

The north and southbound Site Access 2 / Wheatberry Hill Drive / Weddington Road unsignalized intersection approaches are projected to operate unacceptably during both 2031 Build peak hours. All remaining approaches are projected to operate at a LOS A during both peak hours. Following the improvements discussed in **Section 5.1** (shown in **Figure 7-1**), this intersection is projected to operate at an overall LOS C and B during the AM and PM peak hours, respectively. All approaches are projected to operate at a LOS D or better (see **Table 5-6**). No additional improvements are recommended at this intersection due to the proposed development's construction.

**Table 5-5: Intersection Level of Service, Delay and 95<sup>th</sup> Percentile Queue Summary  
2031 Build (Elementary School) Traffic Volumes**

Intersection	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR			
			Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)
1: Providence Road S & Church Parking Lot/Weddington Road	EB Left/Thru/Right		<b>176.6</b>	<b>F</b>	#199	156	<b>55.4</b>	<b>E</b>	48	60
	EB Approach		<b>176.6</b>	<b>F</b>	--	--	<b>55.4</b>	<b>E</b>	--	--
	WB Left	550	<b>133.2</b>	<b>F</b>	#449	380	<b>61.3</b>	<b>E</b>	#275	189
	WB Left/Thru		<b>124.6</b>	<b>F</b>	#485	521	<b>62.2</b>	<b>E</b>	#312	262
	WB Right	325	<b>110.7</b>	<b>F</b>	#766	418	33.4	C	#401	362
	WB Approach		<b>119.3</b>	<b>F</b>	--	--	45.6	D	--	--
	NB Left	550	<b>55.8</b>	<b>E</b>	42	293	52.5	D	15	23
	NB Thru		<b>63.9</b>	<b>E</b>	#689	941	40.5	D	485	414
	NB Right	450	15.8	B	195	548	18.6	B	338	338
	NB Approach		53.0	D	--	--	33.3	C	--	--
	SB Dual Lefts	450	49.2	D	227	320	45.9	D	309	333
	SB Thru/Right		16.0	B	278	242	13.4	B	391	228
	SB Approach		28.6	C	--	--	25.7	C	--	--
Overall			<b>67.8</b>	<b>E</b>	--	--	33.1	C	--	--
2: Providence Road S & Lenny Stadler Way/Site Access 1	EB Left/Thru		38.3	D	35	105	32.4	C	34	88
	EB Right	50	24.6	C	39	50	22.2	C	33	58
	EB Approach		32.9	C	--	--	28.8	C	--	--
	WB Left/Thru		34.6	C	14	49	32.9	C	28	56
	WB Right	425	33.8	C	9	35	34.0	C	43	88
	WB Approach		34.3	C	--	--	33.6	C	--	--
	NB Left	325	<b>57.9</b>	<b>E</b>	#127	160	39.5	D	70	72
	NB Thru/Right		5.4	A	258	931	6.0	A	239	178
	NB Approach		8.2	A	--	--	7.2	A	--	--
	SB Left/Thru/Right		23.3	C	#580	632	15.6	B	439	358
	SB Approach		23.3	C	--	--	15.6	B	--	--
	Overall			15.6	B	--	--	12.6	B	--
3: Providence Road S & Rae Road	EB Left		<b>89.5</b>	<b>F</b>	#495	942	<b>171.3</b>	<b>F</b>	#646	1339
	EB Right		16.2	B	142	291	23.1	C	247	1294
	EB Approach		<b>66.1</b>	<b>E</b>	--	--	<b>115.8</b>	<b>F</b>	--	--
	NB Dual Lefts	450	<b>87.6</b>	<b>F</b>	#241	383	<b>62.4</b>	<b>E</b>	#144	231
	NB Thru		13.2	B	293	349	10.1	B	175	183
	NB Approach		32.5	C	--	--	21.8	C	--	--
	SB Thru		<b>63.6</b>	<b>E</b>	#677	834	<b>138.0</b>	<b>F</b>	#970	2733
	SB Right		5.2	A	120	538	3.8	A	90	2715
	SB Approach		40.4	D	--	--	<b>95.1</b>	<b>F</b>	--	--
	Overall			42.1	D	--	--	<b>77.1</b>	<b>E</b>	--
4: Site Access 2/Wheatberry Hill Drive & Weddington Road	EB Left	125	10.1	B	0	24	9.1	A	0	26
	EB Thru/Right		0.0	A	0	694	0.0	A	0	23
	EB Approach		0.1	A	--	--	0.1	A	--	--
	WB Left/Thru		0.0	A	0	1176	0.0	A	0	935
	WB Right	125	0.0	A	0	88	0.0	A	0	179
	WB Approach		0.9	A	--	--	0.9	A	--	--
	NB Left/Thru/Right		<b>4081.2</b>	<b>F</b>	54.3	1043	<b>2382.4</b>	<b>F</b>	36.8	1050
	NB Approach		<b>4081.2</b>	<b>F</b>	--	--	<b>2382.4</b>	<b>F</b>	--	--
	SB Left/Thru/Right		<b>99.3</b>	<b>F</b>	1.7	258	<b>123.3</b>	<b>F</b>	2.4	244
SB Approach		<b>99.3</b>	<b>F</b>	--	--	<b>123.3</b>	<b>F</b>	--	--	

<sup>1</sup> Overall intersection LOS and delay not reported for TWSC intersections.

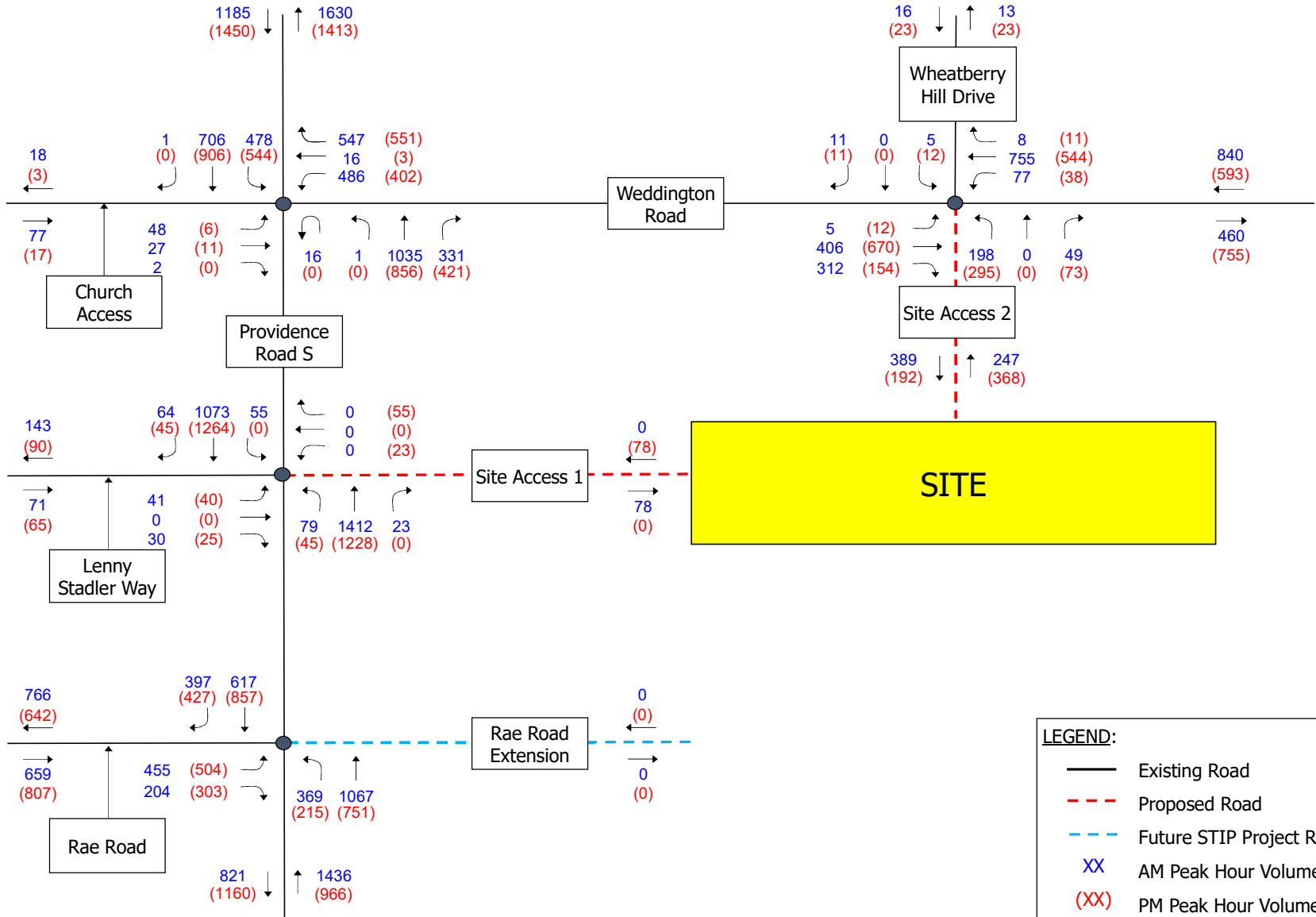
\* - 95th percentile queues for unsignalized intersections reported in number of vehicles.

**Table 5-6: Intersection Level of Service, Delay and 95<sup>th</sup> Percentile Queue Summary  
2031 Build + Improvements (Elementary School) Traffic Volumes**

Intersection	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR			
			Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)
2: Providence Road S & Lenny Stadler Way/Site Access 1	EB Left/Thru		33.1	C	35	97	32.3	C	34	81
	EB Right	50	22.9	C	39	61	22.0	C	33	55
	EB Approach		29.1	C	--	--	28.7	C	--	--
	WB Left/Thru		32.9	C	14	42	32.7	C	28	68
	WB Right	425	32.5	C	9	33	33.9	C	43	108
	WB Approach		32.8	C	--	--	33.5	C	--	--
	NB Left	325	4.9	A	23	183	5.0	A	17	65
	NB Thru/Right		4.8	A	258	442	6.0	A	239	203
	NB Approach		4.8	A	--	--	6.0	A	--	--
	SB Left	100	21.8	C	25	122	7.8	A	4	127
	SB Thru/Right		10.3	B	313	218	14.3	B	410	596
	SB Approach		10.9	B	--	--	14.3	B	--	--
	Overall			8.3	A	--	--	11.4	B	--
4: Site Access 2/Wheatberry Hill Drive & Weddington Road	EB Left	125	9.0	A	7	26	8.9	A	12	68
	EB Thru		11.6	B	198	225	24.4	C	#542	349
	EB Right	150	0.3	A	0	166	0.2	A	0	249
	EB Approach		7.0	A	--	--	18.7	B	--	--
	WB Left	100	9.7	A	21	199	26.2	C	22	94
	WB Thru		30.7	C	#619	892	16.1	B	338	261
	WB Right	125	7.0	A	8	92	8.0	A	10	7
	WB Approach		28.7	C	--	--	16.8	B	--	--
	NB Left/Thru		54.8	D	122	209	29.0	C	82	157
	NB Right	100	21.0	C	35	111	17.9	B	24	65
	NB Approach		48.2	D	--	--	26.8	C	--	--
	SB Left/Thru/Right		19.5	B	15	44	17.5	B	16	50
	SB Approach		19.5	B	--	--	17.5	B	--	--
Overall			24.4	C	--	--	19.2	B	--	--

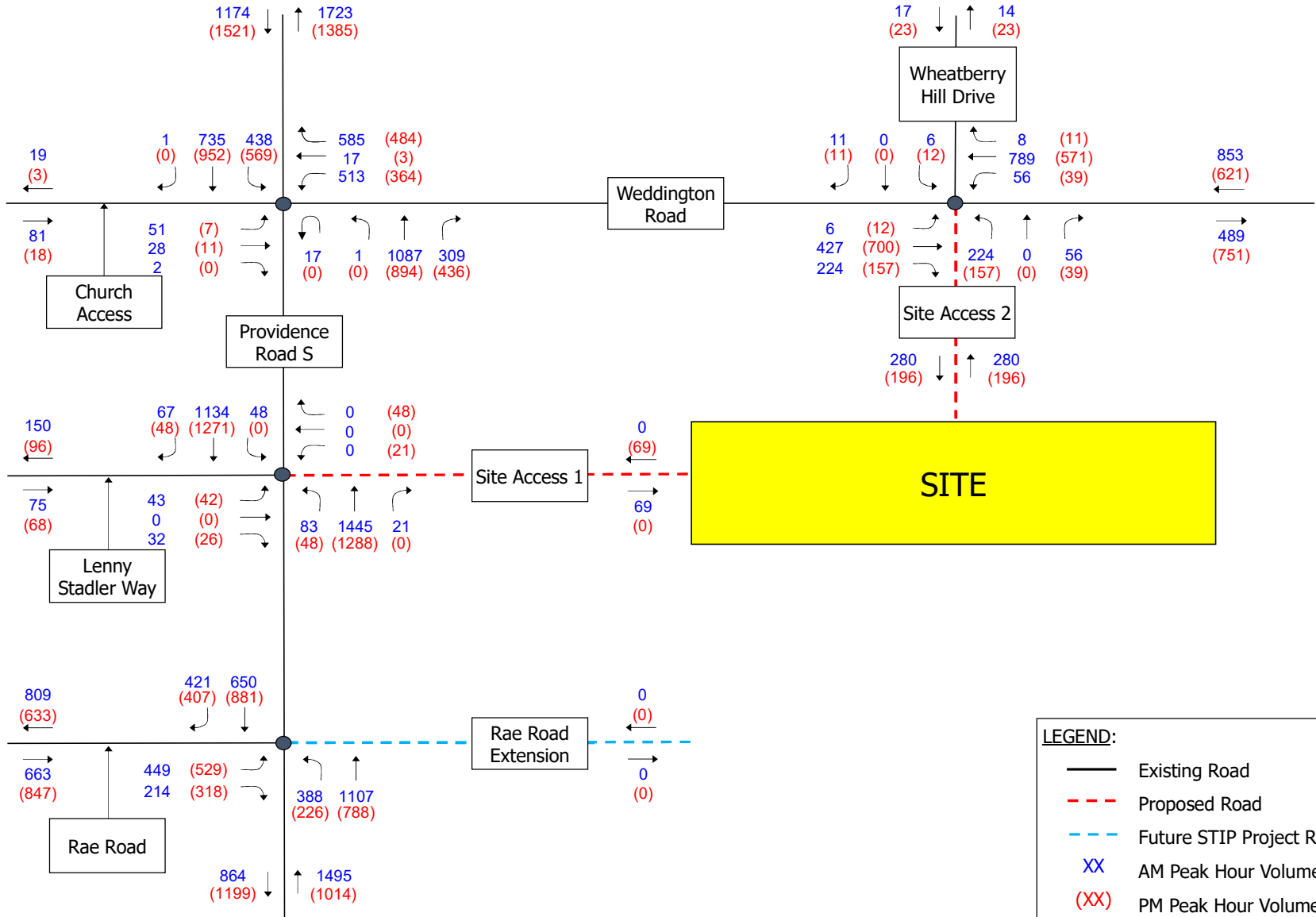
<sup>1</sup> Overall intersection LOS and delay not reported for TWSC intersections.

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



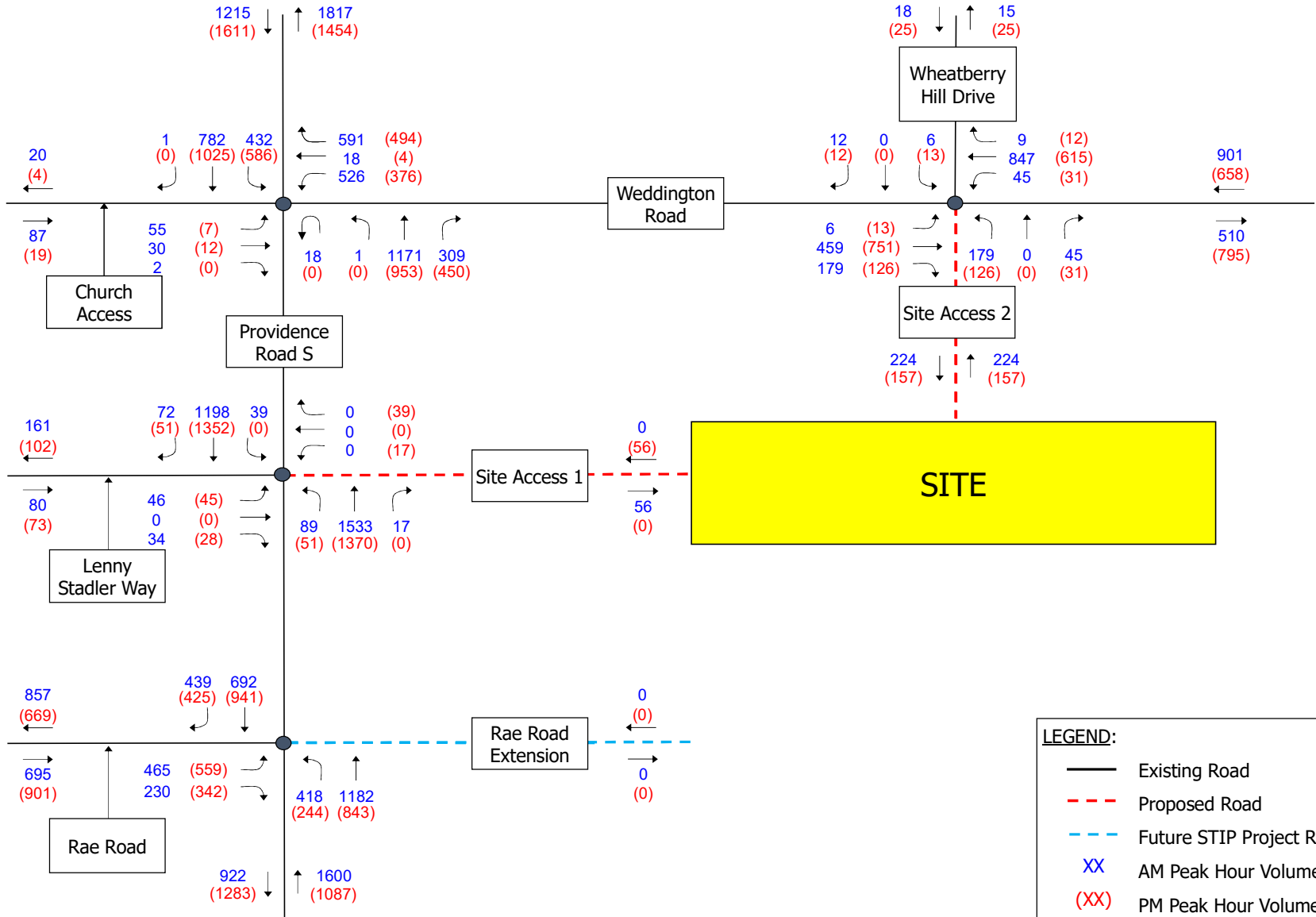
**Liberty Classical Academy  
Traffic Impact Analysis  
2026 Build Traffic Volumes -  
High School**

Figure 5-1



**Liberty Classical Academy  
Traffic Impact Analysis  
2028 Build Traffic Volumes -  
Middle School**

Figure 5-2



**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 2031 Build Traffic Volumes -  
 Elementary School

Figure 5-3



**6 Horizon Year Analysis**

To complete the Horizon Year analyses (including site traffic), the projected high school site trips were added to the 2040 Horizon Year Background traffic volumes. The projected total volumes, along with the future intersection geometry, were used to complete the capacity analyses.

**6.1 2040 HORIZON YEAR TRAFFIC VOLUMES**

The 2040 Horizon Year Background traffic volumes (**Figure 6-1**) were generated using the RK&K FS-1810D Feasibility Study (sealed 09/09/2018) and the NCDOT Traffic Engineering Suite intersection utility breakout (see **Appendix H**). These volumes were then added to site trips to generate the 2040 Horizon Year Build traffic volumes (**Figure 6-2**). High school site trips (**Figure 4-2e**) were used to represent a worst-case traffic volume scenario.

The U-3467 intersection geometry was taken from the June 2017 Design Public Meeting Map (see **Appendix H** and **Figure 7-2**).

To summarize, the Build traffic volumes shown **Figure 6-2** contain the following:

- FS-1810D forecasted volumes; and
- Site trips generated (High School).

**6.2 2040 HORIZON YEAR ANALYSIS**

**Table 6-1** summarizes the intersection LOS, delay, 95<sup>th</sup> percentile queue lengths, and SimTraffic Max Queue Length based on the 2040 Horizon Year Background traffic volumes (**Figure 6-1**). Using these volumes, the signalized intersection of Providence Road S / Church Parking Lot / Weddington Road is projected to operate at an overall LOS E and F during the 2040 Horizon Year Background AM and PM peak hours, respectively. All approaches (except the northbound approach during the PM peak hour) are projected to operate unacceptably.

**Table 6-2** summarizes the intersection LOS, delay, 95<sup>th</sup> percentile queue lengths, and SimTraffic Max Queue Length based on the 2040 Horizon Year Build traffic volumes (shown on **Figure 6-2**). Using these volumes, the signalized intersection of Providence Road S / Church Parking Lot / Weddington Road is projected to operate at an overall LOS F during both 2040 Horizon Year Build peak hours. (except the northbound approach during the PM peak hour) are projected to operate unacceptably. The addition of site trips represents a 18% increase in overall delay. Because delay is not increased by more than 25% (per the NCDOT’s Driveway Manual) no improvements are recommended at this intersection due to the proposed site’s construction.

**Table 6-1: Intersection Level of Service, Delay and 95<sup>th</sup> Percentile Queue Summary  
2040 Horizon Year Background Traffic Volumes**

Intersection	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR			
			Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)
3: Providence Road S & Rae Road	EB Dual Lefts	450	<b>193.1</b>	<b>F</b>	#306	550	<b>153.2</b>	<b>F</b>	#437	523
	EB Thru		<b>62.1</b>	<b>E</b>	#208	1207	<b>103.4</b>	<b>F</b>	#384	1228
	EB Right	400	50.1	D	#535	495	<b>147.7</b>	<b>F</b>	#996	500
	EB Approach		<b>99.4</b>	<b>F</b>	--	--	<b>136.6</b>	<b>F</b>	--	--
	WB Left	250	<b>114.9</b>	<b>F</b>	#278	350	<b>170.7</b>	<b>F</b>	#297	350
	WB Thru		<b>146.8</b>	<b>F</b>	#408	1365	<b>176.8</b>	<b>F</b>	#283	1255
	WB Right	250	36.0	D	82	350	42.4	D	89	350
	WB Approach		<b>131.0</b>	<b>F</b>	--	--	<b>159.5</b>	<b>F</b>	--	--
	NB Dual Lefts	350	<b>147.7</b>	<b>F</b>	#507	450	49.6	D	242	331
	NB Thru		28.4	C	602	1155	30.1	C	620	468
	NB Right	250	7.9	A	73	163	9.2	A	80	327
	NB Approach		<b>65.0</b>	<b>E</b>	--	--	32.8	C	--	--
	SB Left	450	<b>68.6</b>	<b>E</b>	103	550	<b>68.6</b>	<b>E</b>	103	550
	SB Thru		<b>76.8</b>	<b>E</b>	#827	1326	<b>100.8</b>	<b>F</b>	#856	1328
	SB Right	500	28.9	C	548	600	15.8	B	241	600
SB Approach		<b>62.6</b>	<b>E</b>	--	--	<b>82.5</b>	<b>F</b>	--	--	
Overall			<b>78.6</b>	<b>E</b>	--	--	<b>89.5</b>	<b>F</b>	--	--

<sup>1</sup> Overall intersection LOS and delay not reported for TWSC intersections.

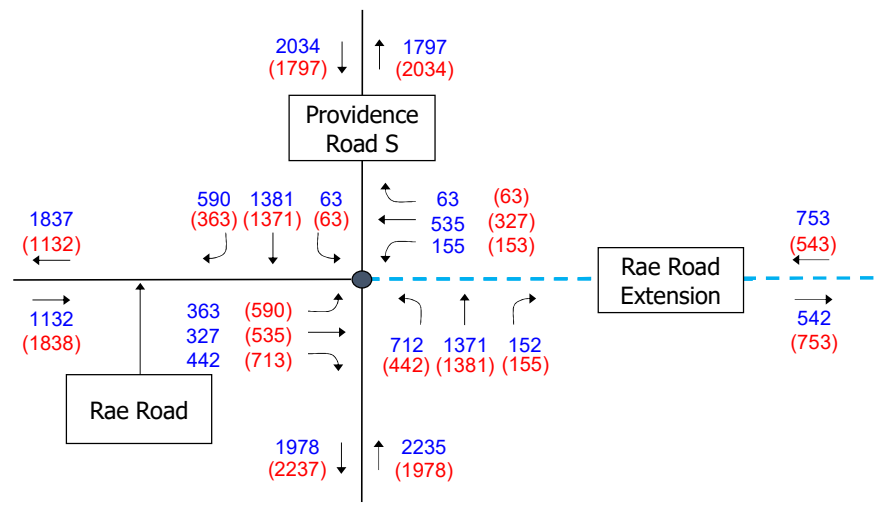
\* - 95th percentile queues for unsignalized intersections reported in number of vehicles.

**Table 6-2: Intersection Level of Service, Delay and 95<sup>th</sup> Percentile Queue Summary  
2040 Horizon Year Build Traffic Volumes**

Intersection	Movement and Approach	Turn Lane Storage (ft)	AM PEAK HOUR				PM PEAK HOUR			
			Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)	Delay <sup>1</sup> (sec/veh)	LOS <sup>1</sup>	*95th Percentile Queue Length	Sim Traffic Max Queue Length (ft)
3: Providence Road S & Rae Road	EB Dual Lefts	450	<b>160.0</b>	<b>F</b>	#333	550	<b>167.4</b>	<b>F</b>	#460	494
	EB Thru		<b>57.2</b>	<b>E</b>	197	1216	<b>103.4</b>	<b>F</b>	#384	1231
	EB Right	400	48.9	D	#535	455	<b>169.6</b>	<b>F</b>	#1017	500
	EB Approach		<b>94.8</b>	<b>F</b>	--	--	<b>150.1</b>	<b>F</b>	--	--
	WB Left	250	<b>78.5</b>	<b>E</b>	#242	350	<b>136.9</b>	<b>F</b>	#285	350
	WB Thru		<b>176.3</b>	<b>F</b>	#421	1464	<b>176.8</b>	<b>F</b>	#283	1238
	WB Right	250	36.8	D	83	350	42.4	D	89	350
	WB Approach		<b>144.5</b>	<b>F</b>	--	--	<b>149.9</b>	<b>F</b>	--	--
	NB Dual Lefts	350	<b>169.2</b>	<b>F</b>	#519	450	53.7	D	247	399
	NB Thru		37.8	D	686	1158	33.0	C	647	506
	NB Right	250	8.4	A	75	216	9.2	A	80	349
	NB Approach		<b>76.6</b>	<b>E</b>	--	--	35.7	D	--	--
	SB Left	450	<b>68.6</b>	<b>E</b>	103	550	<b>68.6</b>	<b>E</b>	103	550
	SB Thru		<b>117.3</b>	<b>F</b>	#887	1338	<b>109.9</b>	<b>F</b>	#884	1329
	SB Right	500	31.9	C	601	600	17.8	B	301	600
SB Approach		<b>89.6</b>	<b>F</b>	--	--	<b>85.6</b>	<b>F</b>	--	--	
Overall			<b>92.4</b>	<b>F</b>	--	--	<b>94.4</b>	<b>F</b>	--	--

<sup>1</sup> Overall intersection LOS and delay not reported for TWSC intersections.

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



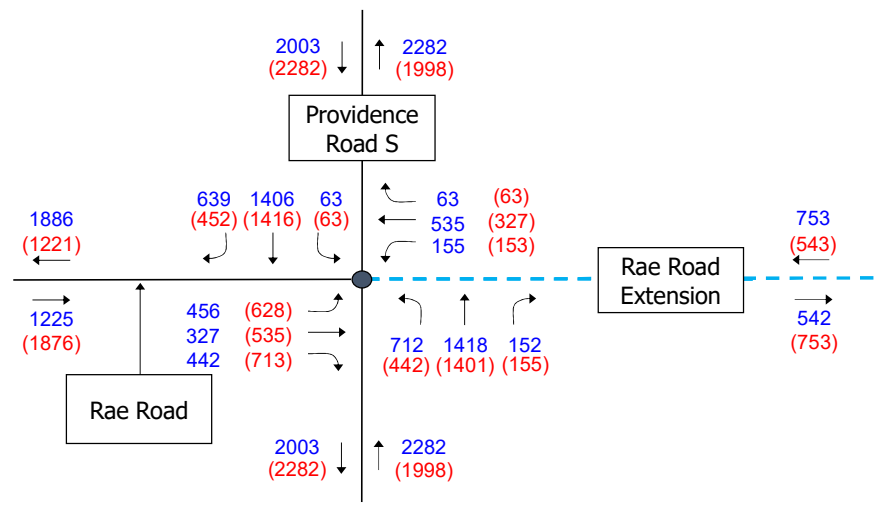
**LEGEND:**

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



**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 2040 Horizon Year Background Traffic Volumes

Figure 6-1



**LEGEND:**

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



**Liberty Classical Academy  
Traffic Impact Analysis**  
2040 Horizon Year Build Traffic Volumes -  
High School

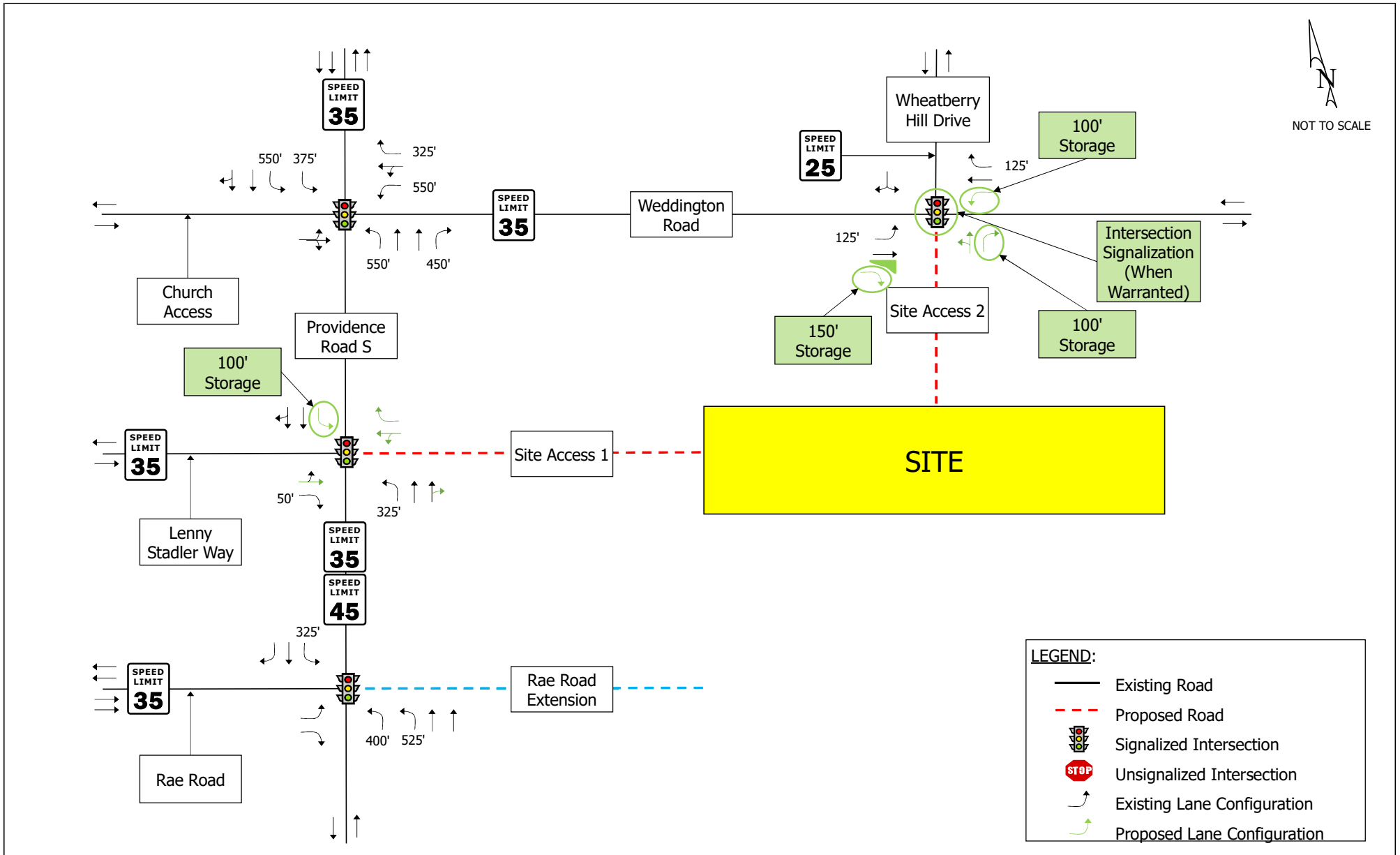
Figure 6-2

## **7 CONCLUSIONS AND RECOMMENDATIONS**

Capacity analyses were performed for 2023 Existing, Background (2026, 2028, and 2031), 2026 Elementary School Build (2026 Background + elementary school site trips), 2028 Middle School Build (2028 Background + middle school site trips), and 2031 High School Build (2031 Background + high school site trips) traffic volumes. In closing, the following improvements (see **Figure 7-1**) are recommended in conjunction with the construction of the proposed development:

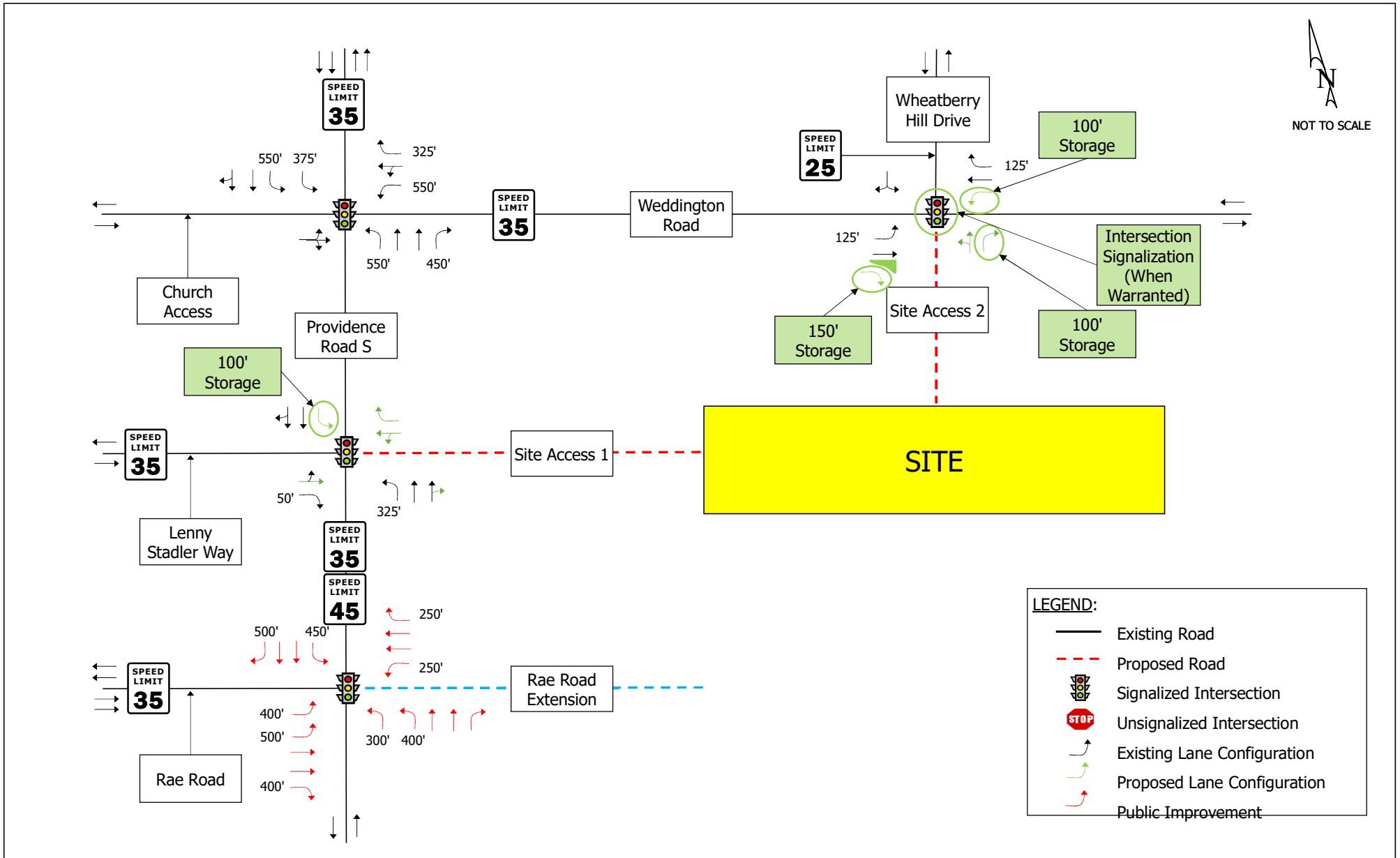
- Providence Road S / Lenny Stadler Way / Site Access 1
  - Dual egress lanes (shared through / left-turn lane and an exclusive right-turn lane)
  - 100-foot southbound left-turn lane (with appropriate taper)
  - 100-foot northbound right-turn lane (with appropriate taper)
  
- Site Access 2 / Wheatberry Hill Drive / Weddington Road
  - Intersection Signalization
  - 150-foot channelized eastbound right-turn lane (with appropriate taper)
  - 100-foot westbound left-turn lane (with appropriate taper)

**Figure 7-1** shows the proposed lane configuration. **Figure 7-2** shows the 2040 Horizon year lane configuration. **Figures 7-3, 7-4,** and **7-5** show the on-site operations plan for the for the high school, middle school, and elementary school, respectively.



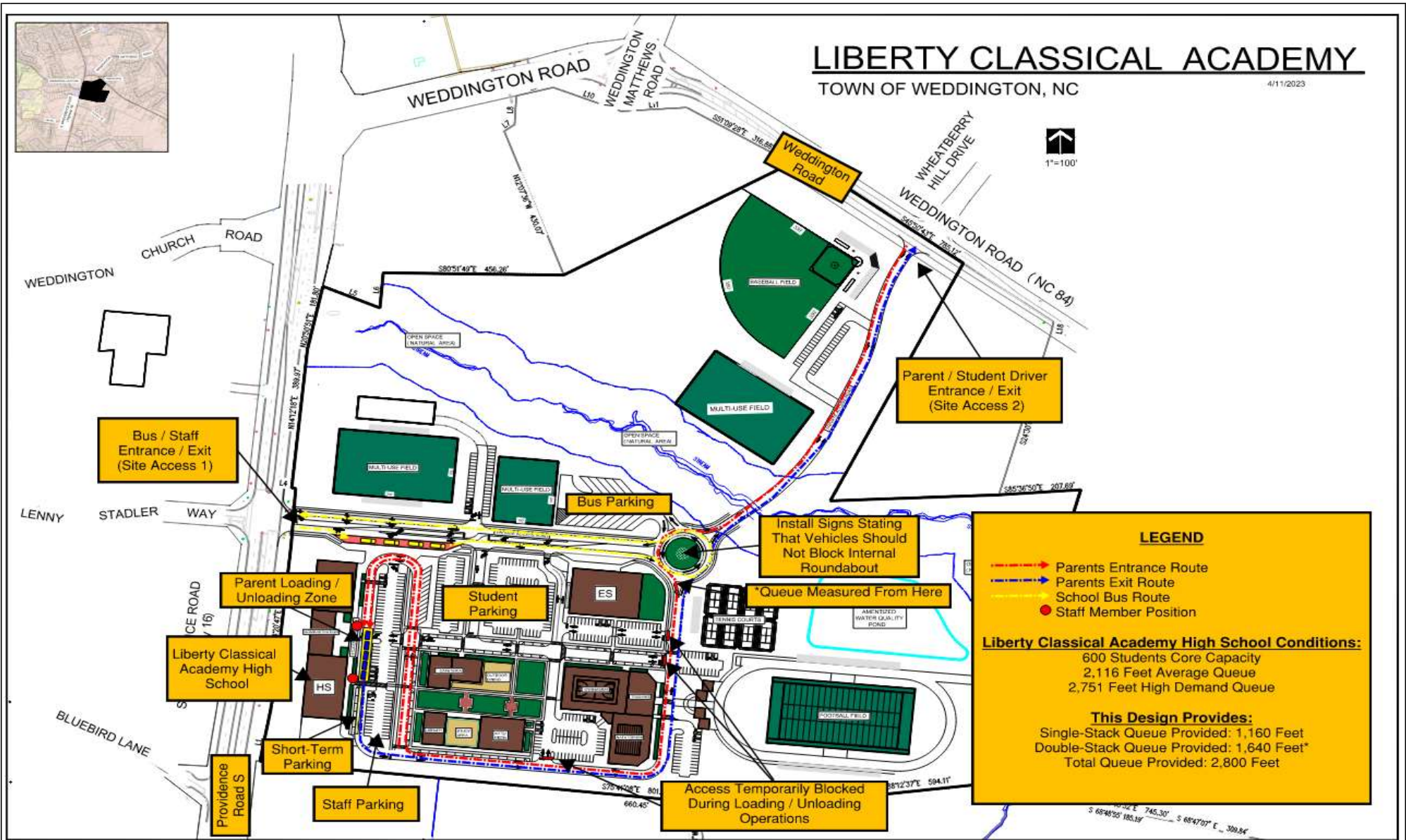
**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 2026 Proposed Lane Configuration

Figure 7-1

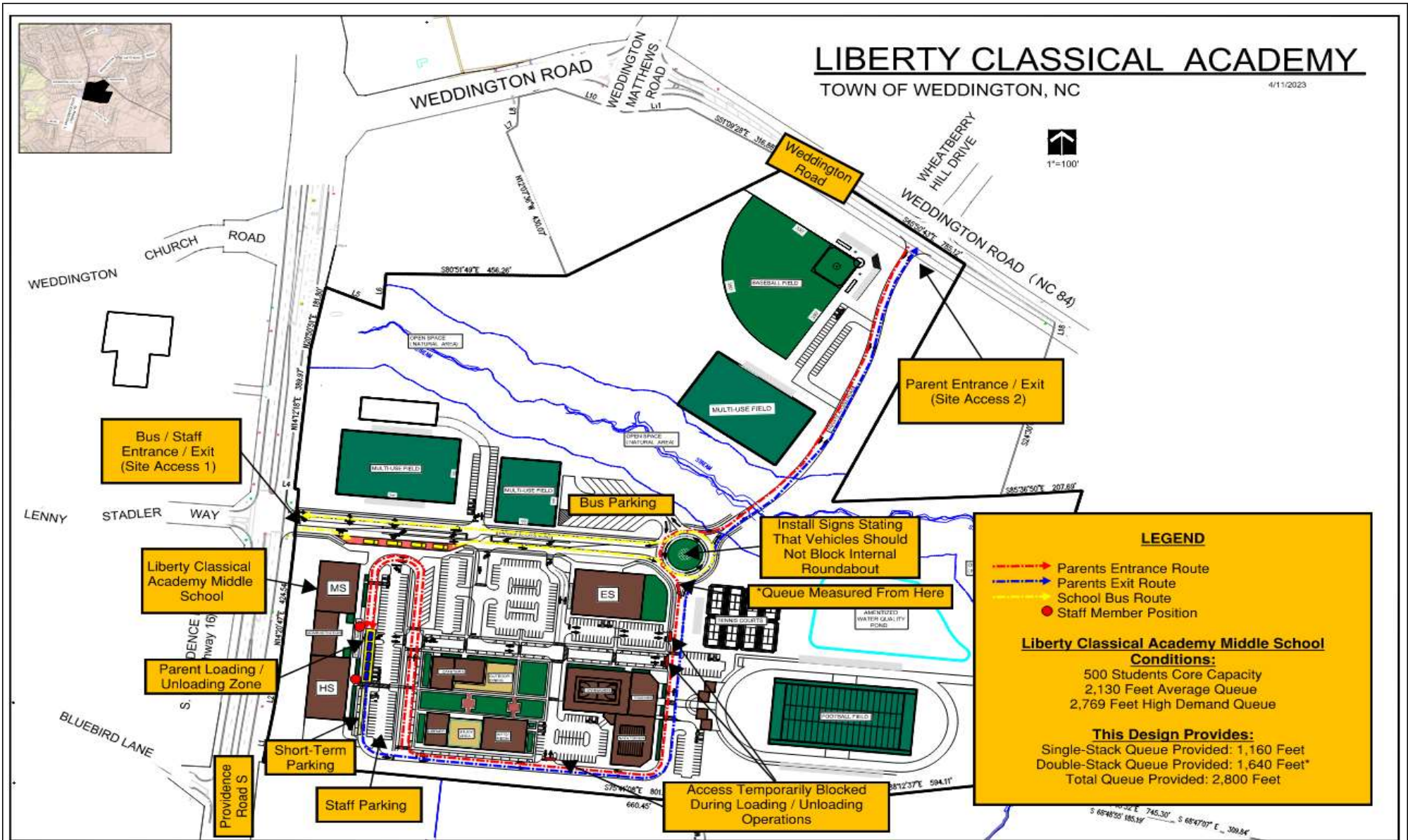


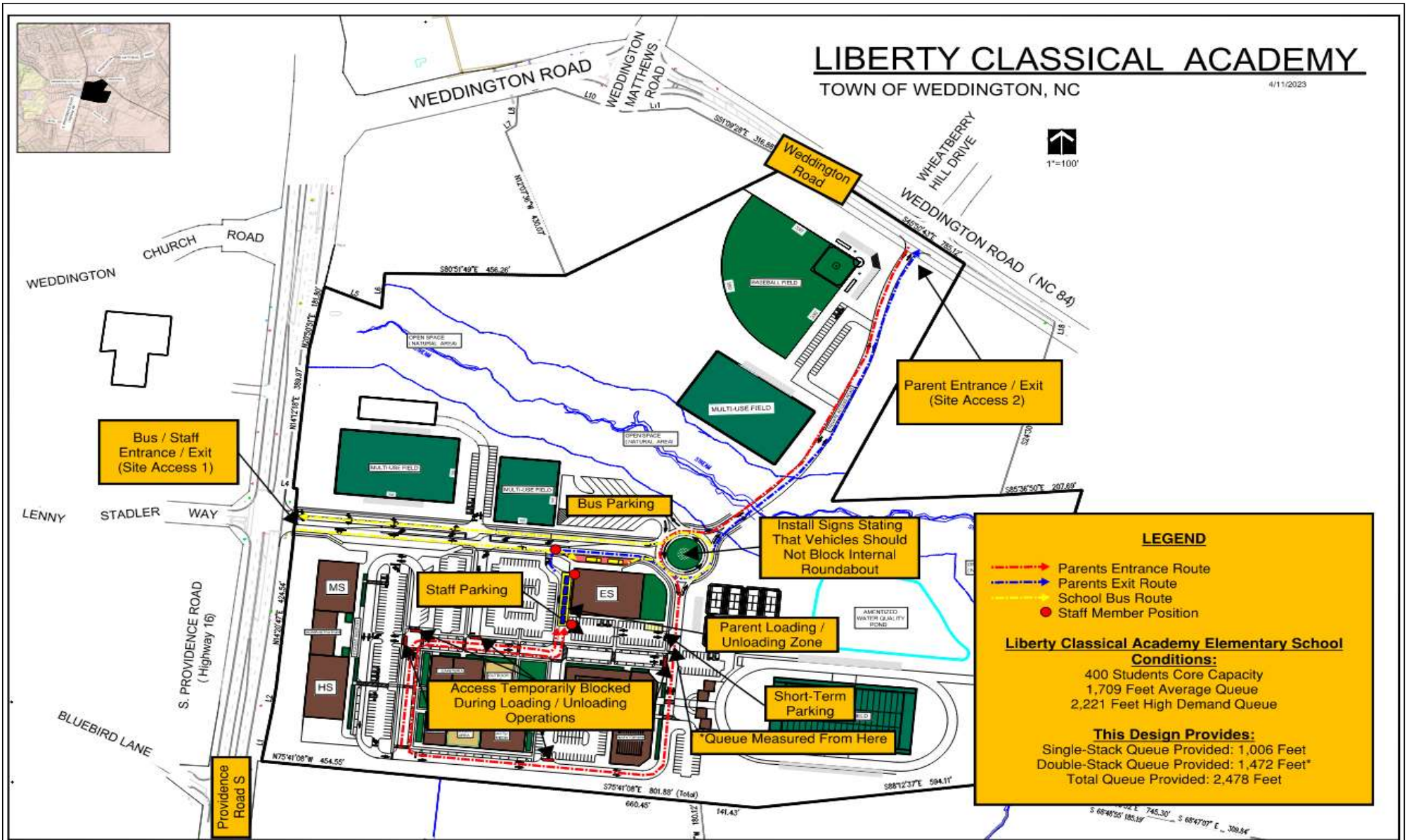
**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 2040 Horizon Year Lane Configuration

Figure 7-2









## **Appendix A – Scoping Information**



# NCDOT Traffic Impact Analysis Need Screening / Scoping Request



A Traffic Impact Analysis (TIA) may be required for developments based on the site trip generation estimates, site context, or at the discretion of the NCDOT District Engineer. The Applicant or the TIA Consultant shall submit this form along with the site plan to the District Engineer to determine the TIA need and, if a TIA is required, initiate the TIA scoping process. Without an approved scope, the TIA is incomplete and will be rejected until the study is revised to conform to NCDOT's TIA requirements.

Project Name: Weddington Classical Academy Previous Name: If Applicable: Weddington Classical Acad  
 Location: NC-16 and NC-84 County: Union Municipality: Weddington  
 Project Description: The construction of a private K-12 School (600 HS, 500 MS, 400 ES)

<b>Project Contact:</b>	Applicant	TIA Consultant
Company Name	<u>Cambridge Properties</u>	<u>Timmons Group</u>
Contact Person	<u>George Maloomian</u>	<u>Jeff Hochanadel</u>
Phone Number	<u>704-564-2137</u>	<u>919-866-4511</u>
Email	<u>glm@cambridgeprop.com</u>	<u>Jeff.Hochanadel@timmons.com</u>
Mailing Address	<u>831 E. Morehead Street, Suite 245</u> <u>Charlotte, NC 28202</u>	<u>5410 Trinity Rd, Suite 102</u> <u>Raleigh, NC 27607</u>

Site Plan Prepared By: Cambridge Properties  
 See site plan/vicinity map requirements on page 2.  
 Parcel Size: 61.72 Acre(s)

Site Plan Date: 11/14/2022  
 Anticipated Build-Out Year: 26-28-31

**Weekday Site Trip Generation - Do NOT adjust for mode split, pass-by, internal capture, or diverted trips.**

ITE LUC	Proposed Land Use	Size	Unit	Daily Trips	Peak Hour Type	AM Peak Hour Trips			PM Peak Hour Trips			Data Source
						Enter	Exit	Total	Enter	Exit	Total	
	See Attached											
Total												X

Refer to the current [NCDOT Congestion Management Capacity Analysis Guidelines](#) for acceptable trip calculation methods and data sources.

\*\*Explain local or other data sources, if used: MSTA Urban Charter School Calculator

- The estimated site trips meet NCDOT's TIA trip threshold of 3,000 daily trips.
- The estimated site trips meet the municipal TIA trip threshold of 100 peak hour trips
- This project is located in a known **STIP** and/ or local CIP project # U-3467, U 5769A
- This project includes a rezoning request.



# NCDOT Traffic Impact Analysis Need Screening / Scoping Request



- The proposed site access is located within 1,000 feet of an interchange.
- The Applicant requests for a new or modified control-of-access break.
- The Applicant requests for a new or modified median break.

\_\_\_\_\_

Applicant's Signature
Print Name
Date

**Site Plan/Vicinity Map Requirement for TIA Need Screening:** While the site plan may not be finalized during the TIA scoping stage, the graphic representation of the proposed development shall provide adequate details on the development scope and context. More specifically, the site plan/map shall clearly show the location and type of each access point, spacing to adjacent and opposing driveways or intersections, internal street network, proposed buildings/parcels with their anticipated uses and sizes at full build-out and, if applicable, any nearby interstate, US, NC or Secondary Roads (SR).

**Project Name:** \_\_\_\_\_ **Project Reference Number:** \_\_\_\_\_

- A TIA is Required by the Local Government.** In addition, the study area is expected to include NCDOT maintained transportation facilities.
- A TIA is Required by NCDOT,** per the [Policy on Street and Driveway Access to North Carolina Highways](#).

If either or both of the boxes above are checked, the Applicant/TIA Consultant is hereby requested to fill out as much as possible of the following TIA scoping checklist, and return it along with the supporting documents to NCDOT prior to the scoping meeting.

- A TIA is NOT required.** This decision is based on the development information presented above. Changes in the development plan will require re-evaluation of the TIA need, and may necessitate a TIA. The Applicant should inform the District Engineer of any significant changes in a timely fashion to avoid delays or rejections of the driveway permit / encroachment agreement applications.



# NCDOT Traffic Impact Analysis Need Screening / Scoping Request



### Additional Comments:

The TIA need decision is made by the NCDOT Division \_\_\_\_\_ District \_\_\_\_\_ on \_\_\_\_\_.

\_\_\_\_\_  
NCDOT District Representative's Signature

\_\_\_\_\_  
Print Name

Email concurrence may be used in lieu of the signature.



# NCDOT TIA Scoping Checklist



**Project Name:** Weddington Classical Academy

**TIA Scoping Date:** 3/20/23

**TIA Need Screening Forms are Attached.** Project Reference #: \_\_\_\_\_ Decision Date: \_\_\_\_\_

**Site Plan and Access**

Provide a site plan illustrating site access, internal and external roadways, buildings and land uses.  
Refer to NCDOT's [Policy on Street and Driveway Access to North Carolina Highways](#) pages 14 and 15 for site plan requirements.

Identify site access.

New Access	On Road	Access Type		Driveway Spacing		
	Road Name	Permitted Movements	Traffic Control	Distance (ft)	Direction	Nearest Intersection / Access
Access A			Signal			
Access B						
Access C						
Access D						
Access E						
Access F						
Access G						
Access H						
Existing Access	Existing Intersection of		Access Modification	Proposed Interconnectivity (If Applicable)		
	Road A	Road B		Connector #	Road Connected	Adjacent Development
Access 1	S Providence Way	Lenny Stadler Way	N/A	Connector 1		
Access 2	Weddington Rd	Wheatberry Hill Dr	N/A	Connector 2		
Access 3				Connector 3		
Access 4				Connector 4		

Additional access clarifications and provisions (e.g., proposed control-of-access or median breaks, modifications of existing access, loading/unloading area access, bike/pedestrian accommodation).

**Proposed K-12 School Site**

- NCDOT [MSTA School Traffic Calculator](#) for Urban Charter School shall be used.
- Peak Hour Factors (PHFs) shall be adjusted/weighted for new school trips (0.5 PHF by default).
- Internal school circulation analysis is required, and should be submitted in advance or concurrent with the TIA submittal.
- Clarify traffic operation plans (e.g. traffic circulation pattern, pedestrian access, drop-off/pick-up zone location and configuration, queue storage area and, if applicable, staggered start times).



# NCDOT TIA Scoping Checklist



**Trip Generation**

The TIA Consultant shall prepare trip generation estimates following the current [NCDOT Congestion Management Capacity Analysis Guidelines](#), and submit the calculation sheets and supporting information to the District Engineer for approval prior to capacity analysis.

ITE LUC	Proposed Land Use	Size	Unit	Daily Trips	Peak Hour Type	AM Peak Hour Trips			PM Peak Hour Trips			Data Source
						Enter	Exit	Total	Enter	Exit	Total	
	See Attached											
Unadjusted Site Trips												X
Internal Capture Trips (Attach Calculation Sheets)												
Internal Capture % of Unadjusted Site Trips				%								X
LUC	Proposed Land Use	Any Internal Trips?		Pass-By % of External Trips								X
				%								
				%								
				%								
				%								
				%								
Pass-By Trips (Attach Calculation Sheets)												X
Adjacent Street Volumes												Please Select
Non-Pass-By Primary Trips												X
Diverted Trips, if Applicable and Justifiable												Please Select

\*\*Explain local or other data sources, if used:

Existing Site Trip Information for Redevelopment Projects (Attach separate sheets as needed)

ITE LUC	Existing Land Use	Size	Unit	Daily Trips	Peak Hour Type	AM Peak Hour Trips			PM Peak Hour Trips			Data Source
						Enter	Exit	Total	Enter	Exit	Total	
					Please Select							Please Select
Total Existing Site Trips												X





# NCDOT TIA Scoping Checklist



## Trip Distribution

- Trip distribution diagrams are submitted concurrently with this document (attach separate sheets).
- Trip distribution diagrams will be submitted separately, along with supporting information, to the District Engineer for review and approval prior to capacity analysis. The trip distribution shall be based on the current and anticipated traffic patterns, as well as instructions noted below.

If required by the District Engineer, the following additional diagrams shall also be submitted:

- Mixed-Use Developments (separate diagrams for residential, commercial, and office trips)
- Inter-Development Trips (if 'internal' trips cross public streets)
- Pass-By Trips
- Diverted Trips
- Each Analysis Period

## Mode Split

- Provide Data Source and Justification

Mode \ Period	Auto		
AM Peak	%	%	%
PM Peak	%	%	%
Daily	%	%	%
	%	%	%

- Identify proper infrastructure and accommodation for other modes of travel.

## Analysis Peak Periods:

- Weekday AM Peak 7:00 a.m. - 9:00 a.m.
- Weekday PM Peak \_\_\_\_\_
- Weekday Midday Peak \_\_\_\_\_
- Weekday PM School Peak 2:00 p.m. - 4:00 p.m.
- Weekend \_\_\_\_\_ Peak \_\_\_\_\_
- Other \_\_\_\_\_



# NCDOT TIA Scoping Checklist



## Study Area Intersections and Data Collection

The study area shall include the site access intersections (both new and existing) identified under “Site Plan and Access” on page 1, as well as the following external and, if applicable, internal intersections.

External Intersection	Intersection of		Traffic Control	Intersection Turning Movement Counts			Notes
	Road A	Road B		New / Existing	Date of Counts	Growth Adjustment	
#1	Providence Rd S	Weddington Rd	Signal	Use Existing Counts	1/12/23	None	None
#2	Providence Rd S	Lenny Stadler	Signal	Use Existing Counts	1/12/23	None	None
#3	Providence Rd S	Marvin School Rd	Signal	Use Existing Counts	1/12/23	None	None
#4							
#5	Weddington Rd	Wheatberry Hill	2-Way Stop	Use Existing Counts	1/12/23	None	None
#6							
#7							
#8							
#9							
#10							
#11							
#12							

Internal Intersection	Intersection of		Access Type		Intersection Spacing		
	Road A	Road B	Traffic Control	Permitted Movements	Distance (ft)	Direction	Nearest Intersection
#101						Please Select	
#102							
#103							
#104							
#105							

The following data will be collected:

- New traffic turning movement counts in  15-min intervals  5-min intervals (near schools)  
 Unless otherwise noted above, new traffic counts shall be collected at the existing study intersections during the analysis periods. Weekday counts shall avoid Mondays, Fridays, holidays, school breaks, road closures, and major weather events.
- To account for the impact of existing and/or proposed school traffic, PHFs will be adjusted for:  
 intersections numbered: \_\_\_\_\_  
 and access points numbered: \_\_\_\_\_
- Traffic Forecast Data for TIP: U-3467, U 5769A
- Roadway/Intersection Configuration & Traffic Control
- Traffic Signal Phasing & Timing Data
- Crash Data: \_\_\_\_\_ Period: \_\_\_\_\_
- Other: \_\_\_\_\_



# NCDOT TIA Scoping Checklist



**Future Year Conditions**

Project Build-Out Year: 2026 / 2028 / 2031

Future Analysis Year(s): 2045

Identify below any funded/committed future transportation improvements, as well as any approved but incomplete developments near the site.

Funded STIP / Local CIP Project	Project Description	Year Complete
U-3467	Rea Road Extension	TBD
U-5769A	NC 16 Widening	TBD

Nearby Approved Development	Location	Future Land Use (exclude any completed phases)	Committed Improvements

Annual Growth Factor: 2 %

Justification/Data Source: 2.5% per area AADT Maps

**Local Comprehensive Transportation Plan Compliance**

Identify Applicable Local Transportation Planning Documents

Identify Applicable Roadways inside the Study Area

Road Name	Classification	Speed Limit	Proposed Cross-Section	Proposed Right-of-Way	Compliance Requirements	Affect Study Intersection #



# NCDOT TIA Scoping Checklist



## Study Method

The traffic analysis shall follow the current [NCDOT Congestion Management Capacity Analysis Guidelines](#), [Policy on Street and Driveway Access to North Carolina Highways](#), and use the current approved version of analysis software (e.g. Synchro/SimTraffic, HCS, Sidra Intersection, TransModeler).

The study shall include the following analysis scenarios for each analysis period.

1. Existing Conditions
2. Future No-Build Conditions (existing + background growth + approved developments + committed or funded improvements)
3. Future Build Conditions (future no-build + site trips)
4. Future Build with Improvements Conditions (future build traffic with improvements to mitigate the proposed development's impacts) and, if applicable:
5. TIP Design Year Analysis 2045

---

6. Alternative Access Scenario (without proposed control-of-access or median break / modification)

The following additional analysis/outputs should be provided as warranted:

- Signal Warrant Analysis for accesses/intersections \_\_\_\_\_
- Multi-Modal Level of Service Analysis
- School Loading Zone Traffic Simulation
- Phasing Analysis (scope separately as needed)
- Safety/Crash Analysis
- Control-of-Access Modification Justification
- Median Break / Modification Justification
- Other 2026 high / 2028 middle / 2031 elementary

## Submittals

In addition to the hardcopies required below, the TIA Consultant shall provide the District Engineer and, if required, the local government an electronic copy of the study documents, including the latest site plan, figures and appendices, in searchable PDF files and the original traffic analysis files (e.g., Synchro, HCS).

To expedite review, the NCDOT electronic submittals shall also be delivered concurrently to:

- Div. Traffic Engr  Regional Traffic Engr  Congestion Management  Other MSTA

Submittals	NCDOT		Local Government	
	Electronic	Hardcopy	Electronic	Hardcopy
Trip Generation & Distribution	Required	0	Required	0
Draft TIA Report	Required	0	Required	0
Final Sealed TIA Report	Required	0	Required	0

- Additional Comments** (municipal TIA requirements, approved variations from NCDOT guidelines)





# NCDOT TIA Submittal Checklist



Submittal: Please Select \_\_\_\_\_ Document Date: \_\_\_\_\_  
 Project Name: \_\_\_\_\_ Previous Name: If Applicable \_\_\_\_\_  
 NCDOT Division: \_\_\_\_\_ District: \_\_\_\_\_ County: \_\_\_\_\_ Municipality: \_\_\_\_\_  
 TIA Consultant: \_\_\_\_\_ Submitted By: \_\_\_\_\_  
 Phone Number: \_\_\_\_\_ Email: \_\_\_\_\_  
 TIA Scoping Checklist Approval Date: \_\_\_\_\_ Unadjusted Daily Site Trips: \_\_\_\_\_

- The approved TIA Scoping Checklist is included in this submittal.
- LOS D or better is expected at all study intersections after proposed mitigations.
- The study report is sealed by a NC Professional Engineer with expertise in traffic engineering.
- This study has identified all known deficiencies with and without the proposed development.
- This study has identified mitigation measures to adequately accommodate the site trips.

Explain here if any of the boxes above are unchecked:

The undersigned affirms that, except for the deviations noted below, the TIA submittal conforms to the current [NCDOT Congestion Management Capacity Analysis Guidelines](#), [Policy on Street and Driveway Access to North Carolina Highways](#), and the TIA Scoping Checklist approved by the NCDOT District Office. The undersigned also acknowledges that the TIA will be rejected if the deviations and justifications are not properly documented and approved by NCDOT.

**Deviations and Justifications** (e.g., changes in site plan, development schedule, site trip and off-site trip estimates, study area, data collection, analysis period and method. Attached separate sheets if needed.)



# NCDOT TIA Submittal Checklist



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TIA Consultant's Signature  
(Professional Engineer of TIA Record)

---

Print Name

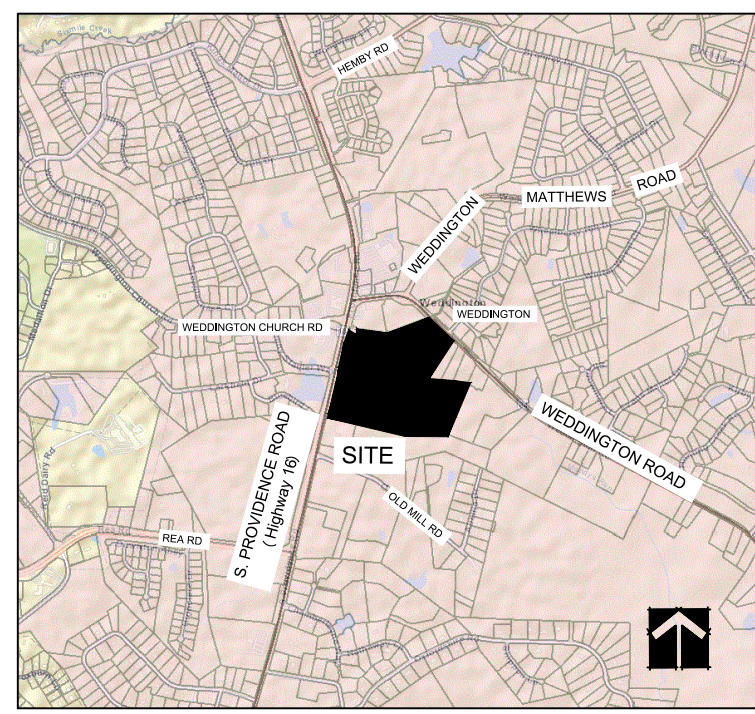
---

Date

# LIBERTY CLASSICAL ACADEMY

TOWN OF WEDDINGTON, NC

3/14/2023



VICINITY MAP

## ZONING CODE SUMMARY

PROJECT NAME: LIBERTY CLASSICAL ACADEMY  
 OWNER/APPLICANT: LIBERTY CLASSICAL ACADEMY, INC  
 2520 WHITEHALL PARK DRIVE  
 SUITE 100, CHARLOTTE NC 28273.  
 JURISDICTION: TOWN OF WEDDINGTON,  
 UNION COUNTY, NC

EXISTING ZONING: R-40, R-CD  
 EXISTING USE: VACANT, RESIDENTIAL  
 PROPOSED ZONING: E-D ( EDUCATIONAL DISTRICT)  
 PROPOSED USE: K-12 SCHOOL

SITE ACREAGE: 61.13 ACRES  
 IN R.O.W.: 0.40 ACRES  
 NET SITE ACREAGE: 60.73 ACRES

SETBACKS:  
 S. PROVIDENCE ROAD: 50' FRONTAGE BUFFER:  
 WEDDINGTON ROAD: 50' FRONTAGE BUFFER:  
 PERIMETER ABUTTING 06150040, 06150075, 06150074: 20'  
 PERIMETER ABUTTING 06150073D, 06150073B, 06150080,  
 061500072, 06150077, 06150077F: 40'

BUILDING AREA:	1 LEVEL
ELEMENTARY SCHOOL:	22,000 SF
MIDDLE SCHOOL:	23,500 SF
HIGH SCHOOL:	26,500 SF
CAFETERIA:	5,000 SF
LIBRARY/ARTS/MEDIA:	30,000 SF
GYMNASIUM/TRAINING:	28,000 SF
NATORIUM:	14,000 SF
APPROXIMATE TOTAL:	149,000 SF

## SITE SUMMARY

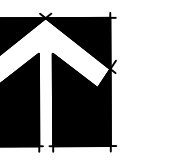
LIBERTY CLASSICAL CAMPUS: 43.64 ACRES  
 OPEN SPACE/WATER QUALITY: 13.39 ACRES  
 ACCESS ROAD AREA: 3.7 ACRES  
 TOTAL SITE AREA: 60.73 ACRES

## LIBERTY CLASSICAL ACADEMY

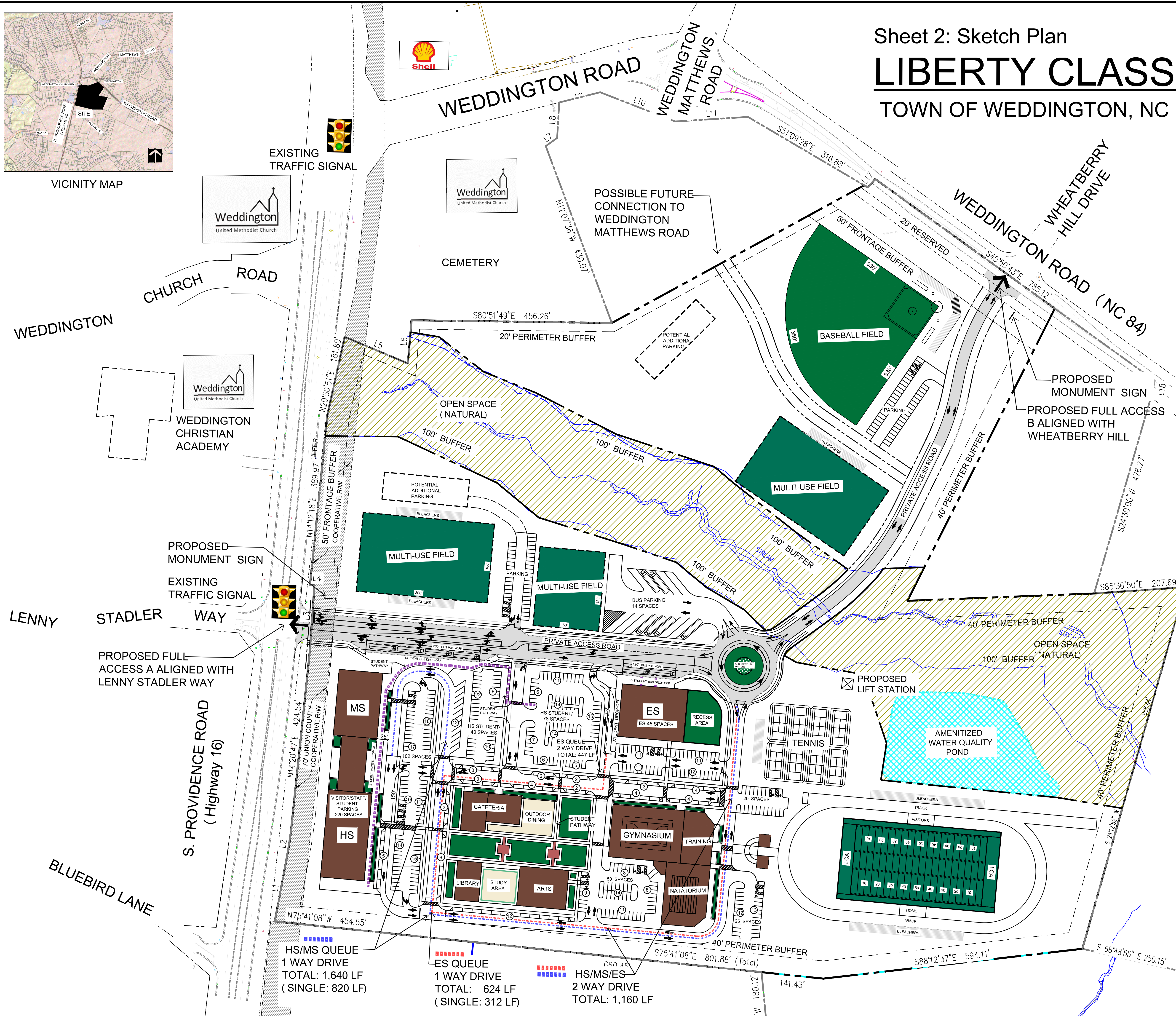
HIGH SCHOOL: 600 STUDENTS  
 MIDDLE SCHOOL: 500 STUDENTS  
 FUTURE ELEMENTARY SCHOOL: 400 STUDENTS  
 TOTAL STUDENTS: 1,500 STUDENTS  
 TOTAL PARKING: ±412 SPACES  
 OPEN SPACE: 22%

## LEGEND

- OPEN SPACE
- ACCESS ROAD AREA
- WATER QUALITY POND



1"=100'



HS/MS QUEUE  
 1 WAY DRIVE  
 TOTAL: 1,640 LF  
 (SINGLE: 820 LF)

ES QUEUE  
 1 WAY DRIVE  
 TOTAL: 624 LF  
 (SINGLE: 312 LF)

HS/MS/ES  
 2 WAY DRIVE  
 TOTAL: 1,160 LF



## MSTA School Traffic Calculations

AM and PM Peak Traffic Estimates  
(These numbers do not reflect peak hour traffic volumes)

School Name: Liberty Classical Academy - Elementary School

Type: **Urban Charter**

Version: 04012021

AM Cars / Student	PM Cars / Student	Avg. Car Length	PM At one Time
55.94%	39.15%	22.19	48.67%
52.91%	47.50%	22.19	46.12%
50.08%	47.58%	22.83	55.71%

MSTA School Queue Input					Calculations					
Grade Level	Student Population	Number of Buses	Staff Members	Student Drivers	PM Total Vehicles	PM Peak Vehicles	Average Queue Length	Total AM Trips	Total PM Trips	High Demand Length
K - 10	400	6	50		157	77	1709	504	370	30%
11th										
12th										
Sum >>	400	6	50		157	77	1709	504	370	2221

513

Grade K-10								
AM Trips Generated					PM Trips Generated			
Direction	Parents	Buses	Staff	Trips	Parents	Buses	Staff	Trips
IN	224	6	50	280	157			157
OUT	224			224	157	6	50	213
AM K-10 Trips				504	PM K-10 Trips			370

ADT
874

### NOTES

- Average Queue Length does not include an alternative traffic pattern required for high traffic demand days which is usually 30% additional length.
- Average Queue Length does not include the Student Loading Zone.
- Peak traffic volumes at schools normally occur within a 30-minute time period. (justifying a PHF of 0.5)

AM Trips Generated									PM Trips Generated			
Direction	Parents	Buses	Staff	Trips	Parents	Buses	Staff	Trips				
IN												
OUT												
AM 11th Trips					PM 11th Trips							

AM Trips Generated									PM Trips Generated			
Direction	Parents	Buses	Staff	Trips	Parents	Buses	Staff	Trips				
IN												
OUT												
AM 12th Trips					PM 12th Trips							

<b>All AM TRIPS</b>	In	280
	Out	224
	Total	504

<b>All PM TRIPS</b>	In	157
	Out	213
	Total	370

# MSTA School Traffic Calculations

AM and PM Peak Traffic Estimates  
(These numbers do not reflect peak hour traffic volumes)

School Name: Liberty Classical Academy - Middle School

Type: **Urban Charter**

Version: 04012021

AM Cars / Student	PM Cars / Student	Avg. Car Length	PM At one Time
55.94%	39.15%	22.19	48.67%
52.91%	47.50%	22.19	46.12%
50.08%	47.58%	22.83	55.71%

MSTA School Queue Input					Calculations					
Grade Level	Student Population	Number of Buses	Staff Members	Student Drivers	PM Total Vehicles	PM Peak Vehicles	Average Queue Length	Total AM Trips	Total PM Trips	High Demand Length
K - 10	500	7	62		196	96	2130	628	461	30% 2769
11th										
12th										
Sum >>	500	7	62		196	96	2130	628	461	2769

639

Grade K-10									
AM Trips Generated					PM Trips Generated				
Direction	Parents	Buses	Staff	Trips	Parents	Buses	Staff	Trips	
IN	280	7	62	349	196			196	
OUT	280			280	196	7	62	265	
AM K-10 Trips				628	PM K-10 Trips				461

**ADT**  
1089

Grade 11th									
AM Trips Generated					PM Trips Generated				
Direction	Parents	Buses	Staff	Trips	Parents	Buses	Staff	Trips	
IN									
OUT									
AM 11th Trips					PM 11th Trips				

Grade 12th									
AM Trips Generated					PM Trips Generated				
Direction	Parents	Buses	Staff	Trips	Parents	Buses	Staff	Trips	
IN									
OUT									
AM 12th Trips					PM 12th Trips				

<b>All AM TRIPS</b>	In	349
	Out	280
	Total	628

<b>All PM TRIPS</b>	In	196
	Out	265
	Total	461

1089

**NOTES**

- Average Queue Length does not include an alternative traffic pattern required for high traffic demand days which is usually 30% additional length.
- Average Queue Length does not include the Student Loading Zone.
- Peak traffic volumes at schools normally occur within a 30-minute time period. (justifying a PHF of 0.5)

# MSTA School Traffic Calculations

## AM and PM Peak Traffic Estimates

(These numbers do not reflect peak hour traffic volumes)

School Name: Liberty Classical Academy - High School

Type: Urban Charter

Version: 04012021

AM Cars / Student	PM Cars / Student	Avg. Car Length	PM At one Time
55.94%	39.15%	22.19	48.67%
52.91%	47.50%	22.19	46.12%
50.08%	47.58%	22.83	55.71%

MSTA School Queue Input					Calculations					
Grade Level	Student Population	Number of Buses	Staff Members	Student Drivers	PM Total Vehicles	PM Peak Vehicles	Average Queue Length	Total AM Trips	Total PM Trips	High Demand Length
K - 10	300	4	37		118	58	1287	377	277	30% 1673
11th	150	3	17	48	53	25	555	175	174	721
12th	150	2	15	128	21	12	274	163	187	357
Sum >>	600	9	69	176	192	95	2116	714	638	2751 636

Grade K-10									
AM Trips Generated					PM Trips Generated				
Direction	Parents	Buses	Staff	Trips	Parents	Buses	Staff	Trips	
IN	168	4	37	209	118			118	
OUT	168			168	118	4	37	159	
AM K-10 Trips				377	PM K-10 Trips				277

Grade 11											
AM Trips Generated					PM Trips Generated						
Direction	Parents	Buses	Staff	Student Dvr	Trips	Parents	Buses	Staff	Student Dvr	Trips	
IN	58	3	17	39	117	53				53	
OUT	58				58	53	3	17	48	121	
AM 11th Trips					175	PM 11th Trips					174

Grade 12											
AM Trips Generated					PM Trips Generated						
Direction	Parents	Buses	Staff	Student Dvr	Trips	Parents	Buses	Staff	Student Dvr	Trips	
IN	21	2	15	103	141	21				21	
OUT	21				21	21	2	15	128	166	
AM 12th Trips					163	PM 12th Trips					187

All AM TRIPS	In	467
	Out	247
	Total	714

All PM TRIPS	In	192
	Out	446
	Total	638

ADT
654
349
350
1352

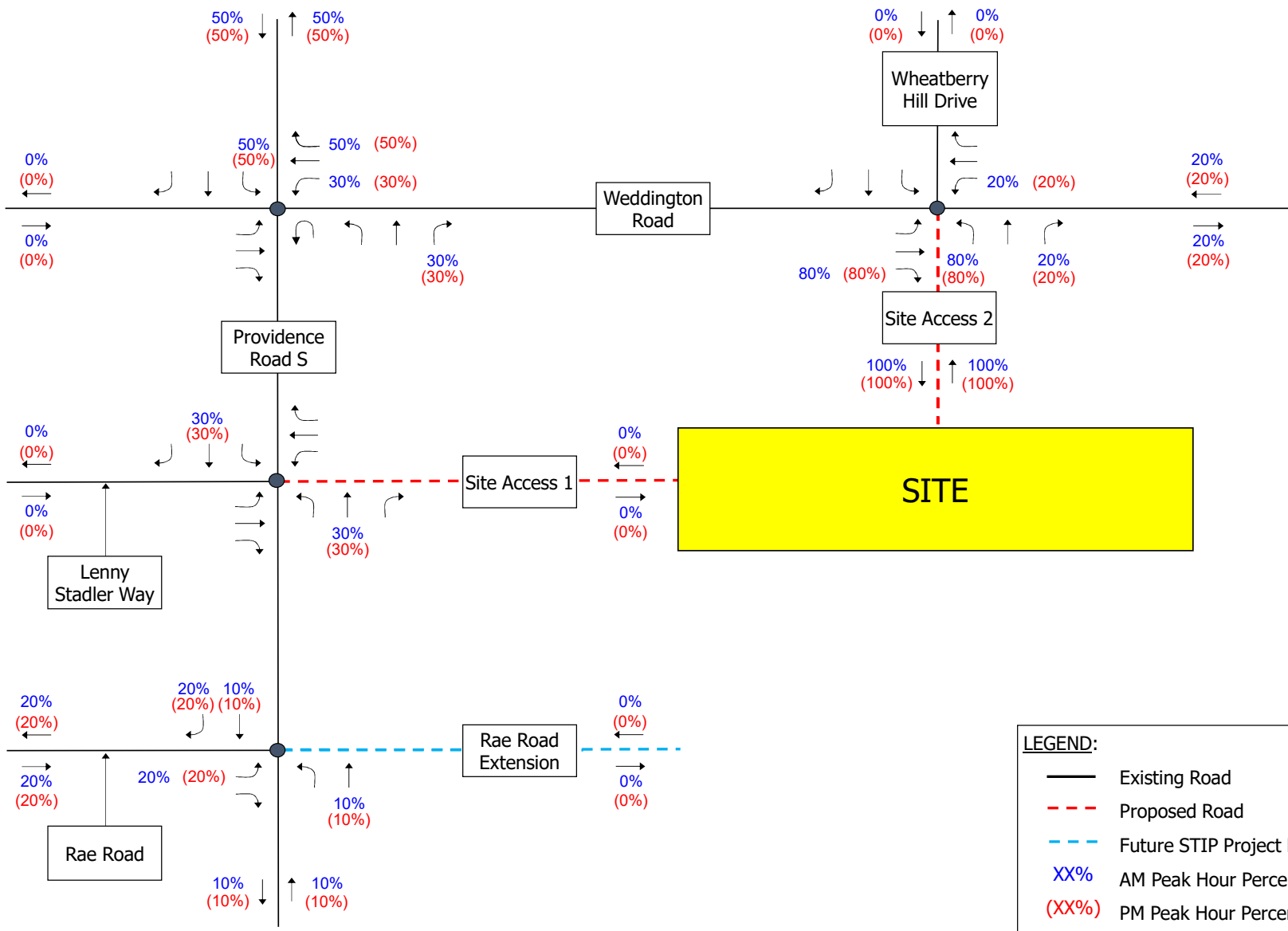
**NOTES**

- Average Queue Length does not include an alternative traffic pattern required for high traffic demand days which is usually 30% additional length.
- Average Queue Length does not include the Student Loading Zone.
- Peak traffic volumes at schools normally occur within a 30-minute time period. (justifying a PHF of 0.5)

### Weddington Classical Day School Trip Generation

Type	Variable	ADT	AM Peak Hour			School PM Peak Hour			High Demand Queue Length
			In	Out	Total	In	Out	Total	
Elementary School	400 Students	874	280	224	504	157	213	370	2221-feet
Middle School	500 Students	1089	349	280	628	196	265	461	2769-feet
High School	600 Students	1352	467	247	714	192	446	638	2751-feet

\*\* Bell times to be spaced by 45-minutes; therefore, schools queuing will not occur concurrently

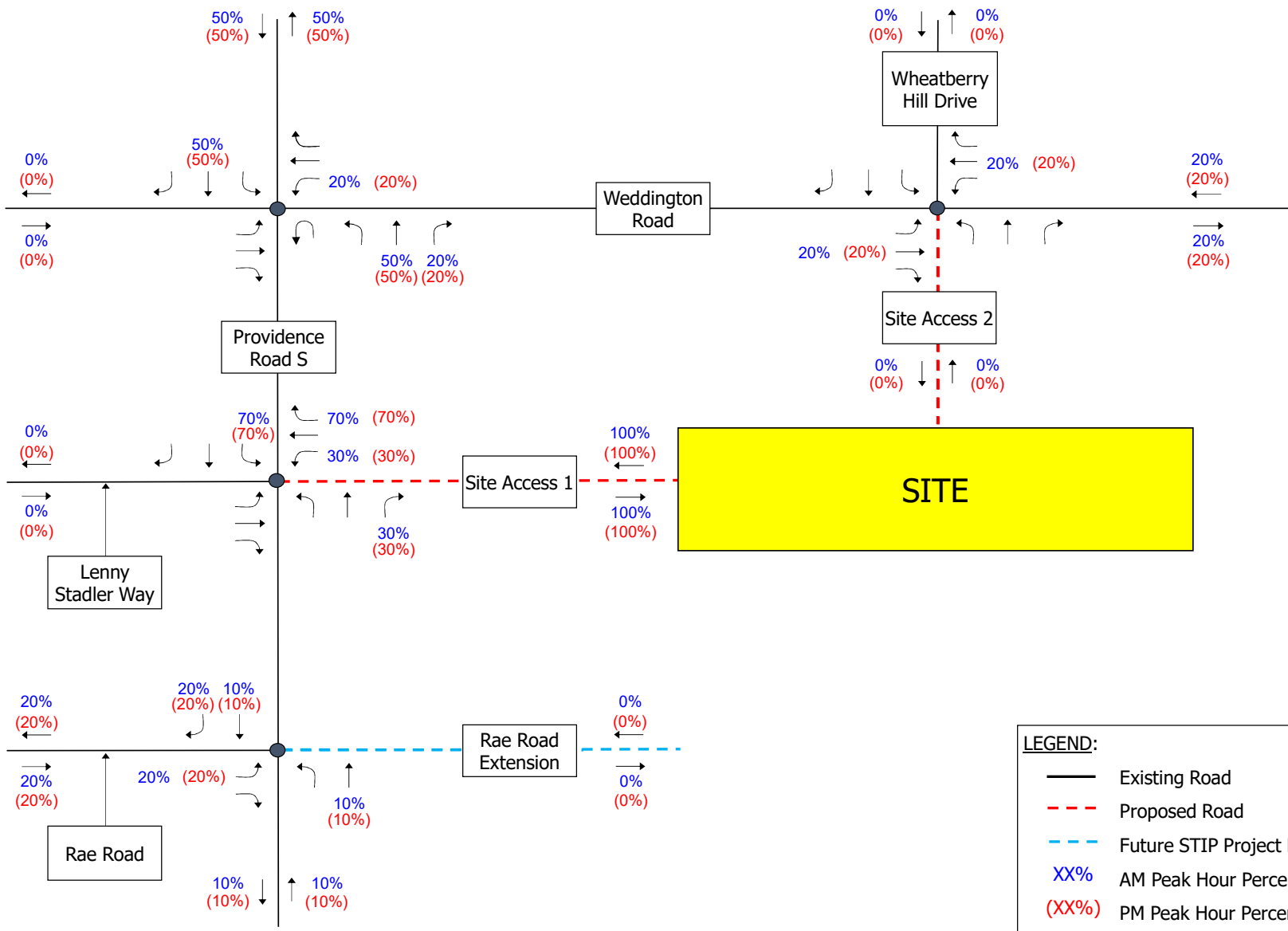


LEGEND:	
	Existing Road
	Proposed Road
	Future STIP Project Road
	AM Peak Hour Percentages
	PM Peak Hour Percentages



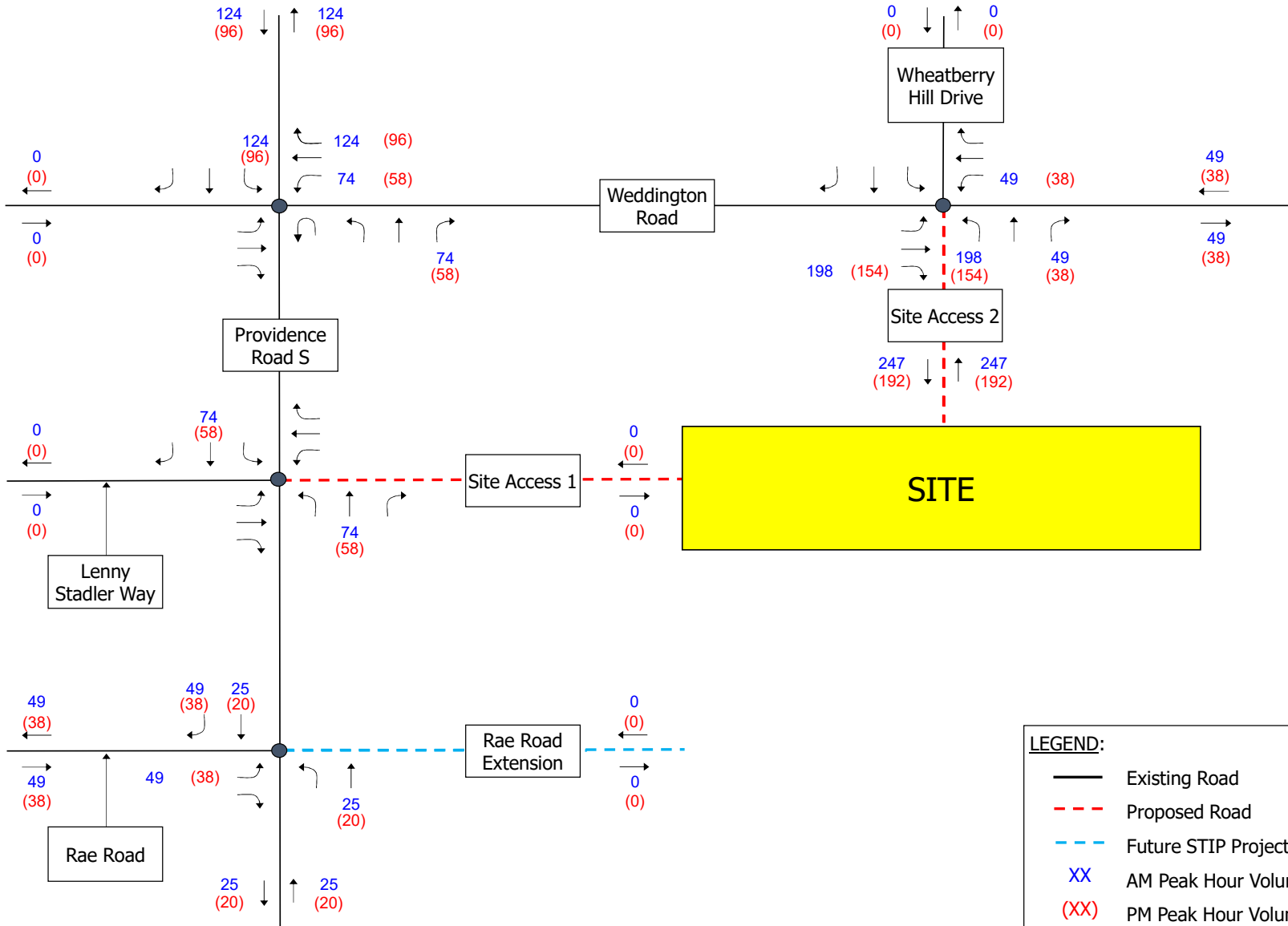
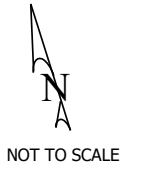
**Weddington Classical Day School**  
**Traffic Impact Analysis**  
 Trip Distribution Percentages-Parents/Staff/Student Drivers

Figure 4-1a



**Weddington Classical Day School**  
**Traffic Impact Analysis**  
 Trip Distribution Percentages-Buses

Figure 4-1b



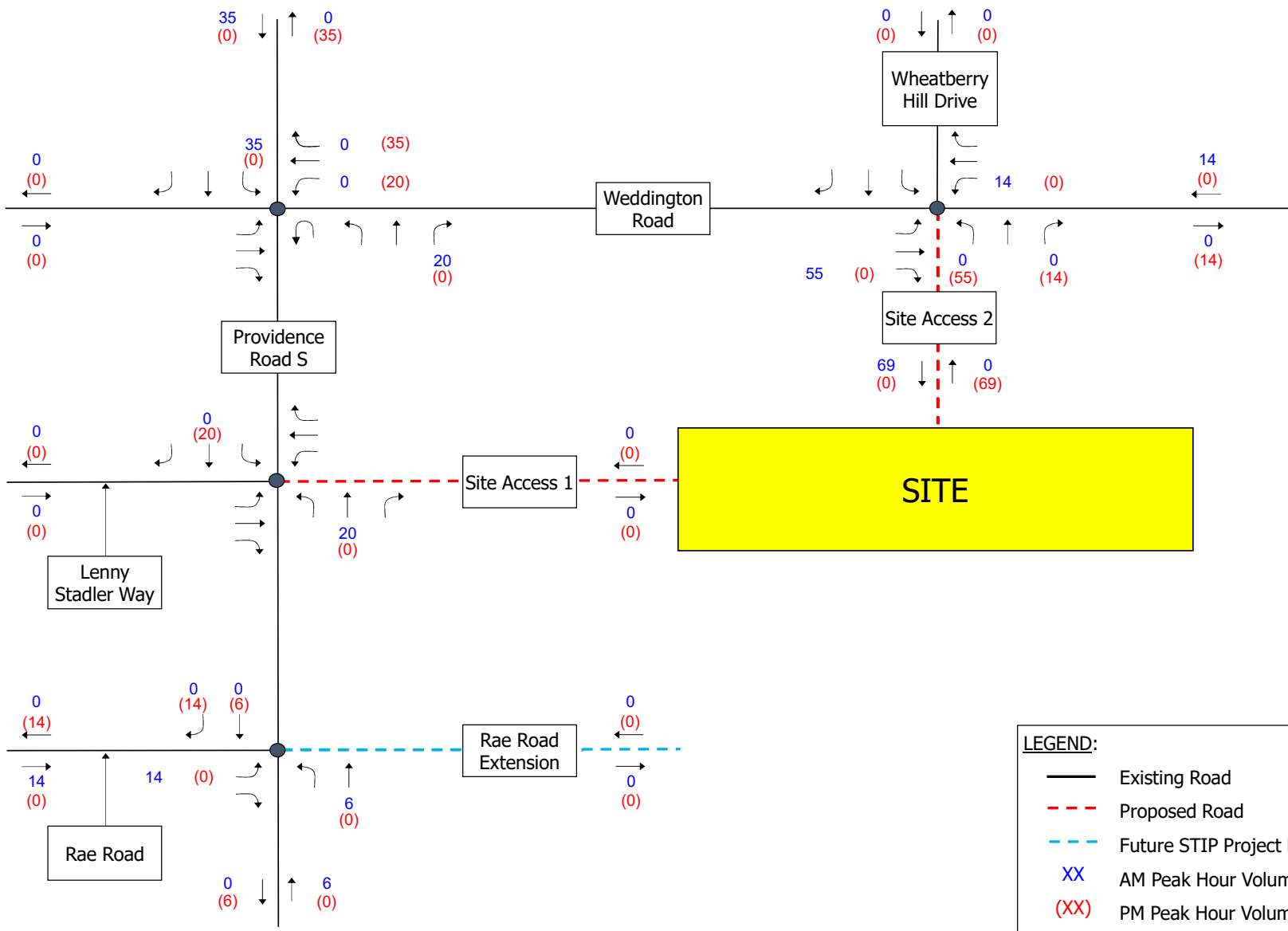
**LEGEND:**

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



**Weddington Classical Day School**  
**Traffic Impact Analysis**  
 High School Trip Distribution Volumes-Parents

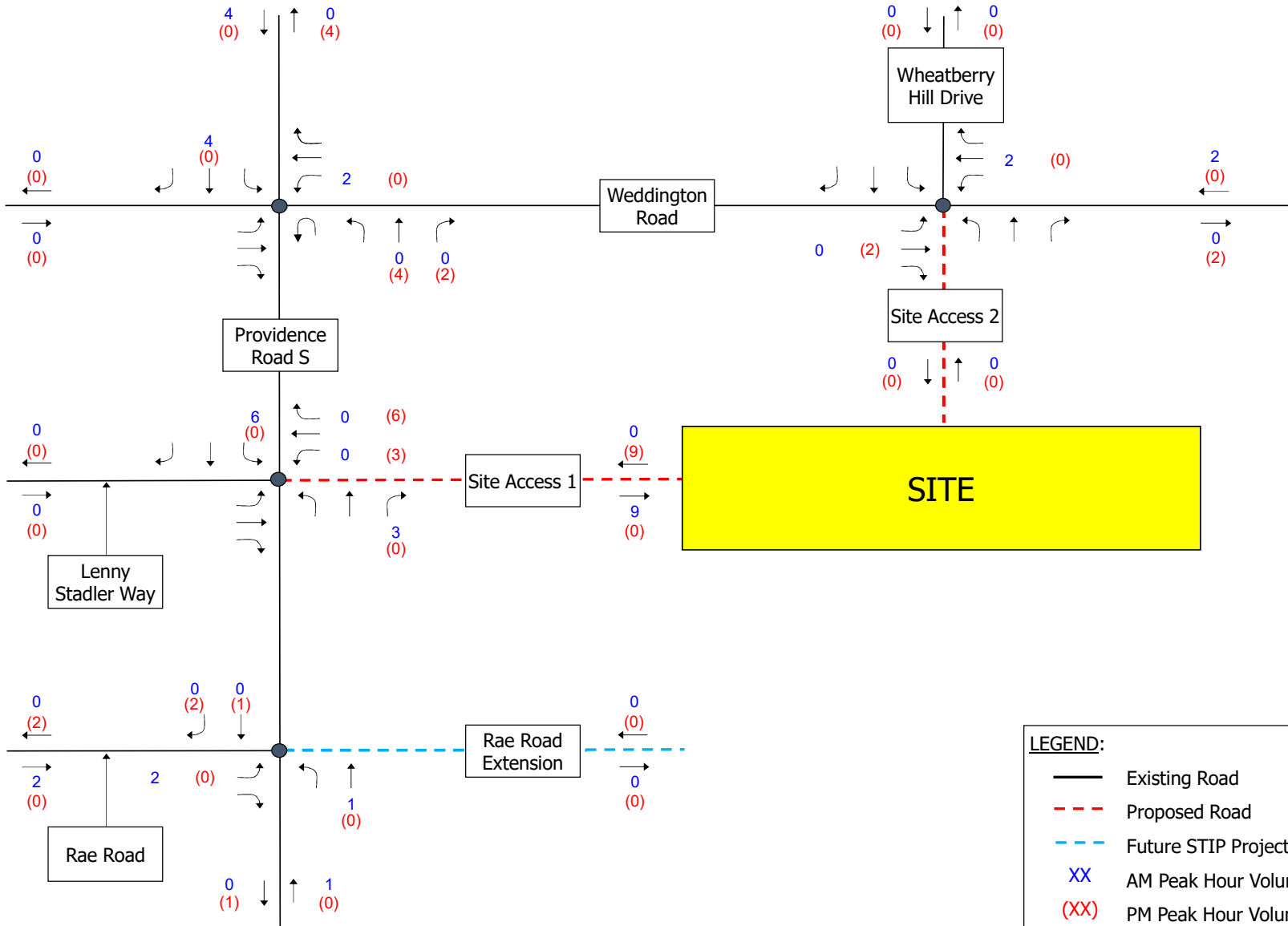
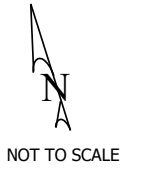
Figure 4-2a



**Weddington Classical Day School  
Traffic Impact Analysis  
High School Trip Distribution Volumes-Staff**

Figure 4-2b





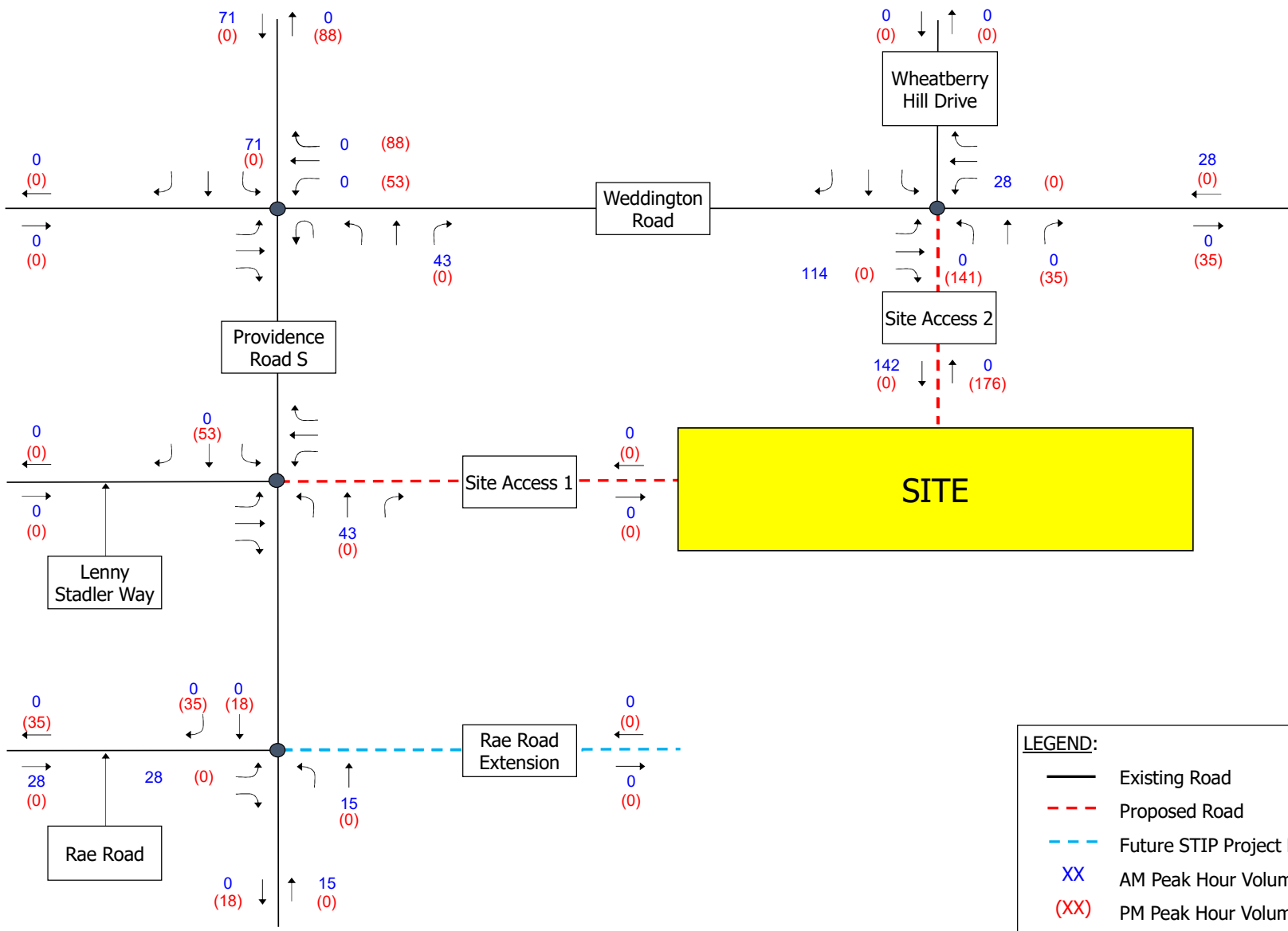
**LEGEND:**

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



**Weddington Classical Day School**  
**Traffic Impact Analysis**  
 High School Trip Distribution Volumes-Buses

Figure 4-2c



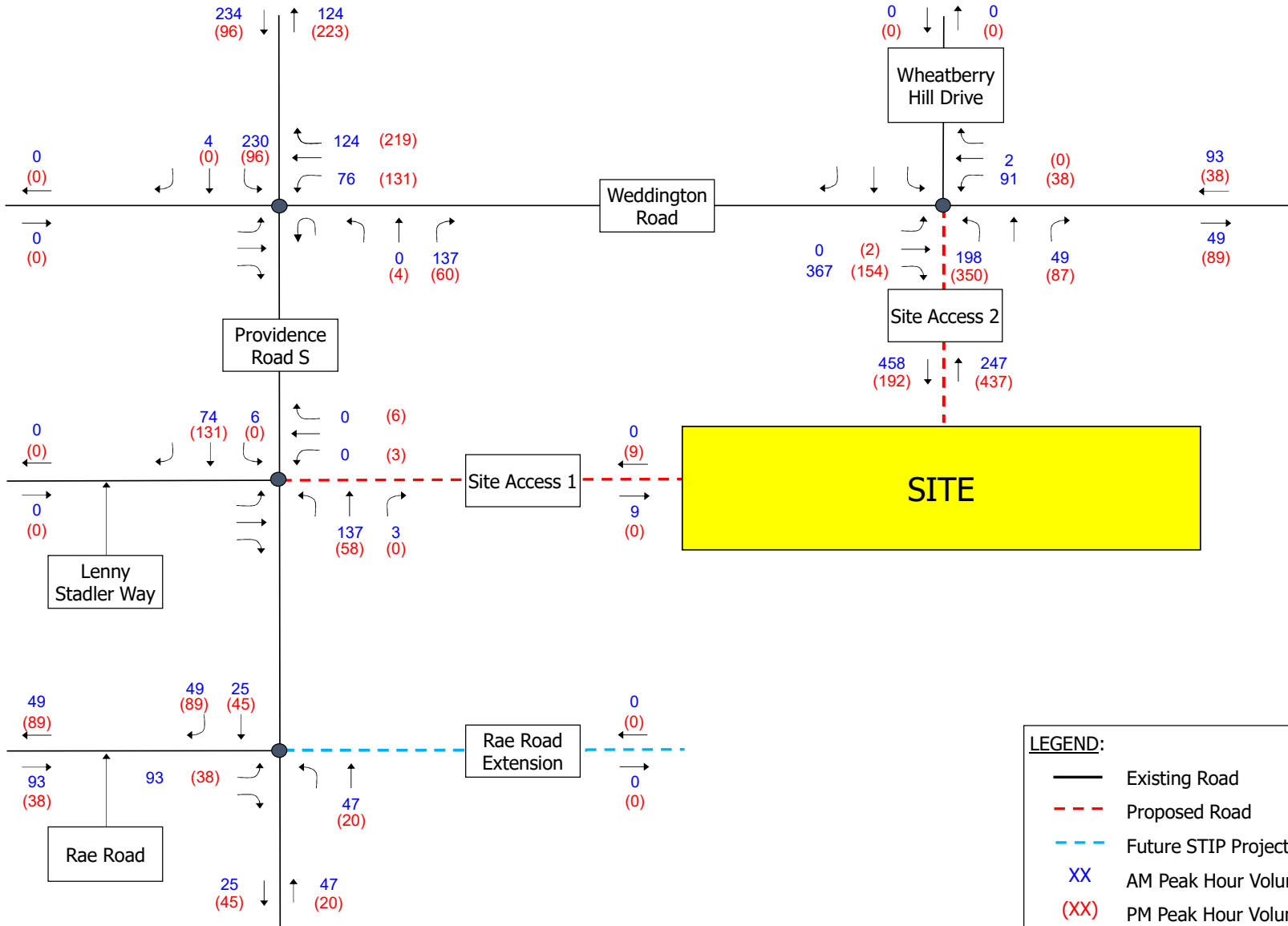
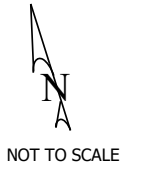
**LEGEND:**

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



**Weddington Classical Day School**  
**Traffic Impact Analysis**  
 Trip Distribution Volumes-Student Drivers

Figure 4-2d



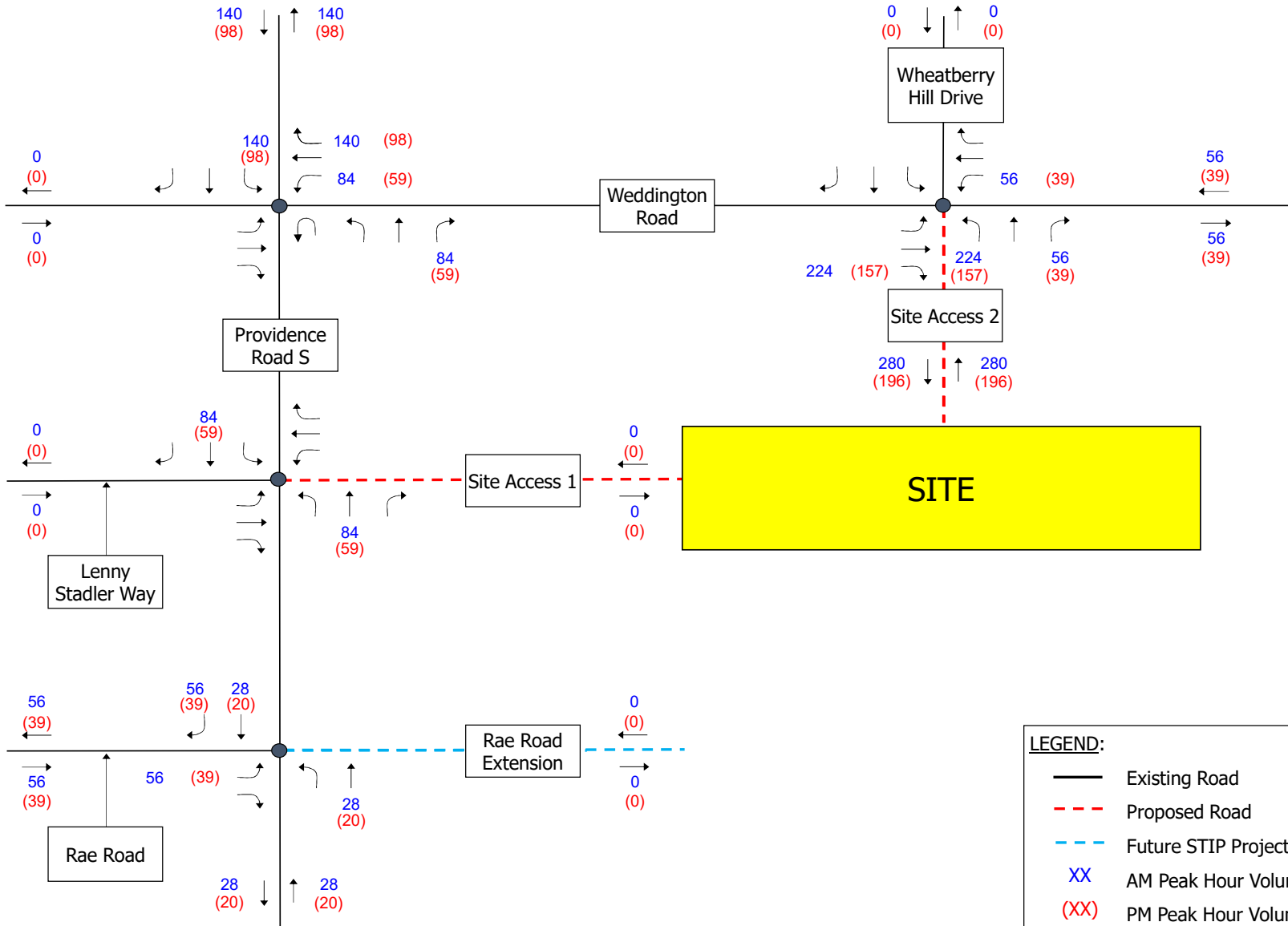
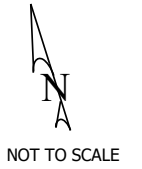
**LEGEND:**

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



**Weddington Classical Day School**  
**Traffic Impact Analysis**  
 High School Combined Trip Distribution Volumes

Figure 4-2e



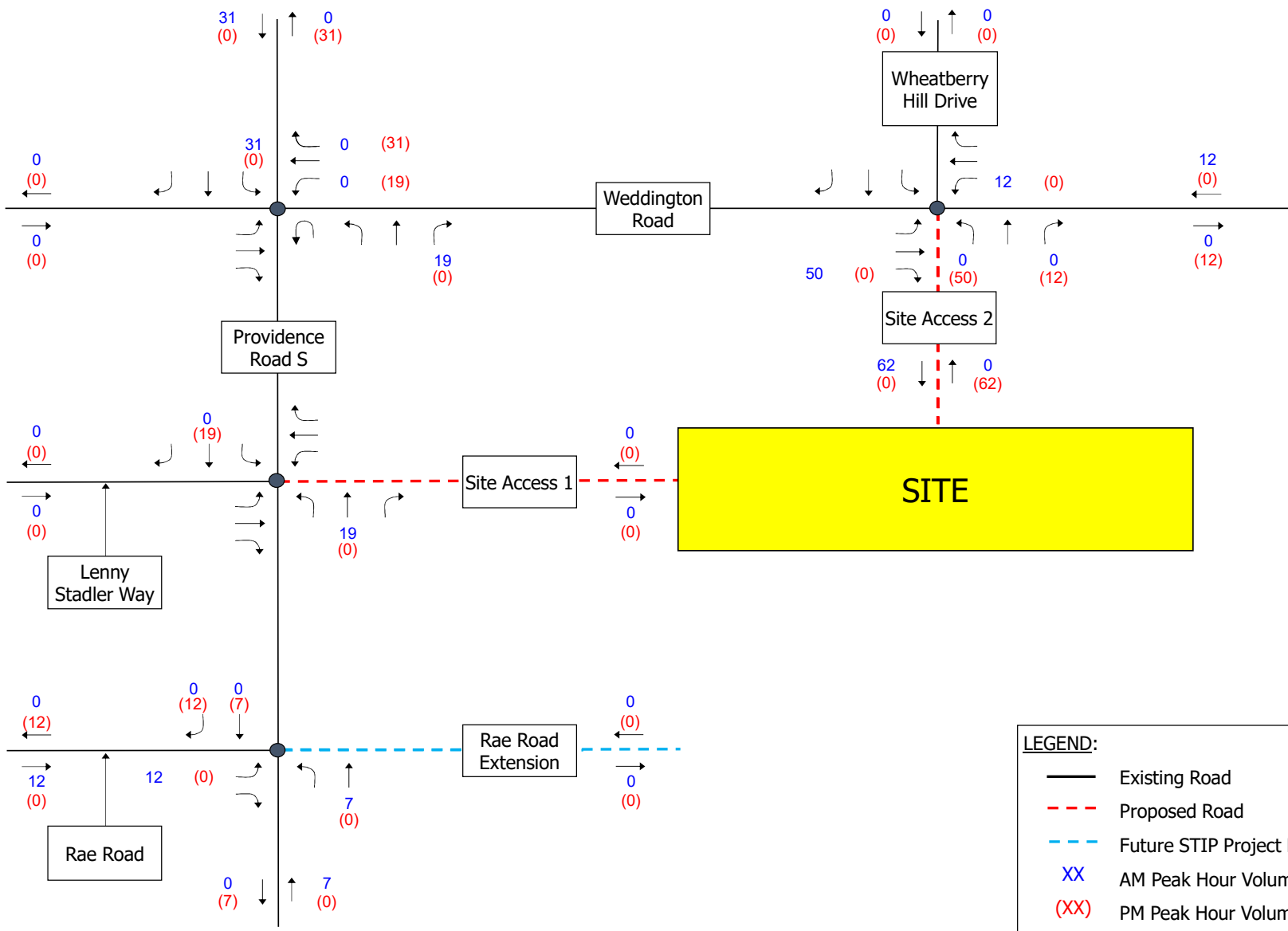
**LEGEND:**

	Existing Road
	Proposed Road
	Future STIP Project Road
<b>XX</b>	AM Peak Hour Volume (vph)
<b>(XX)</b>	PM Peak Hour Volume (vph)



**Weddington Classical Day School**  
**Traffic Impact Analysis**  
 Middle School Trip Distribution Volumes-Parents

Figure 4-3a



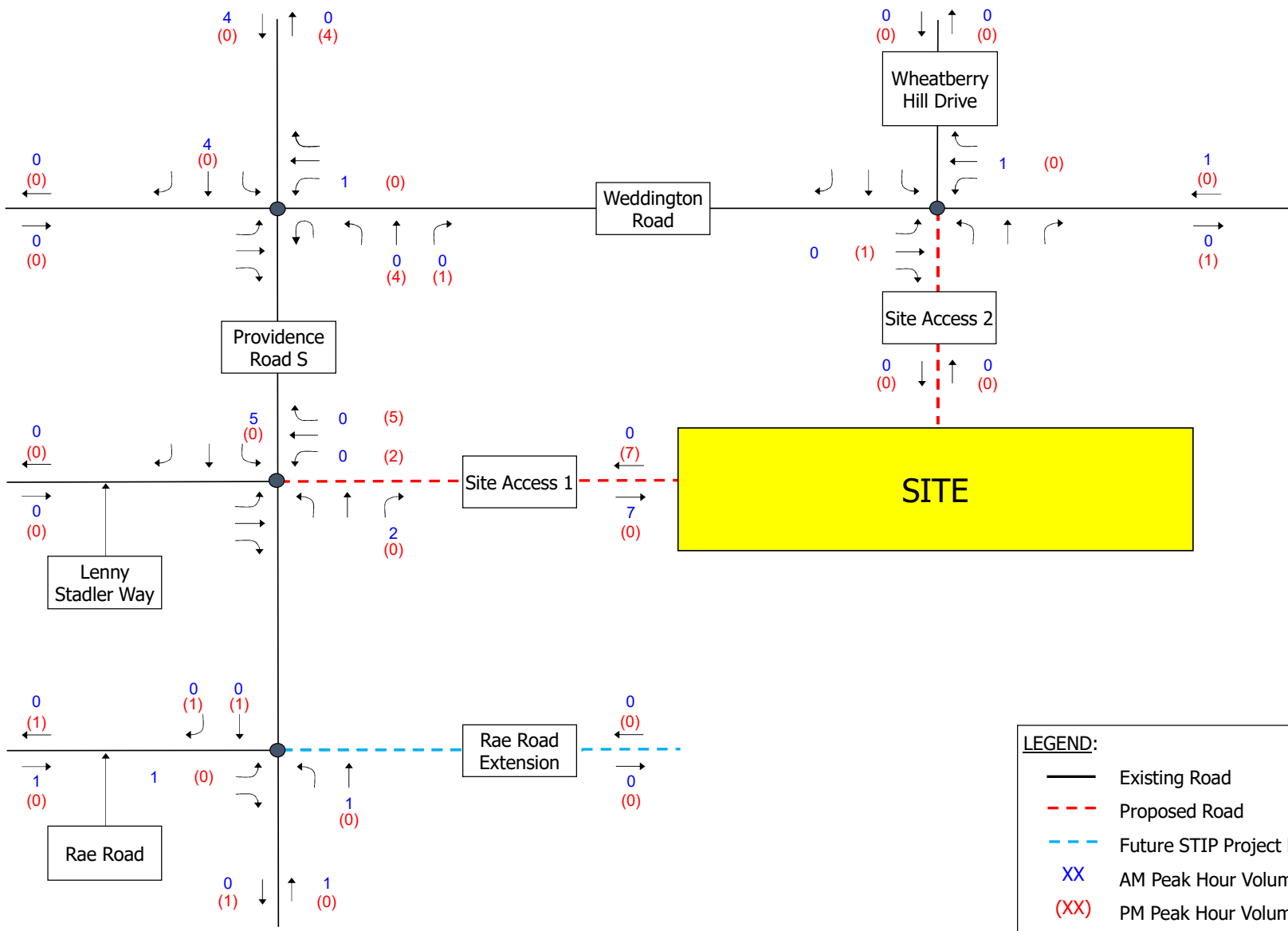
**LEGEND:**

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



**Weddington Classical Day School**  
**Traffic Impact Analysis**  
 Middle School Trip Distribution Volumes-Staff

Figure 4-3b



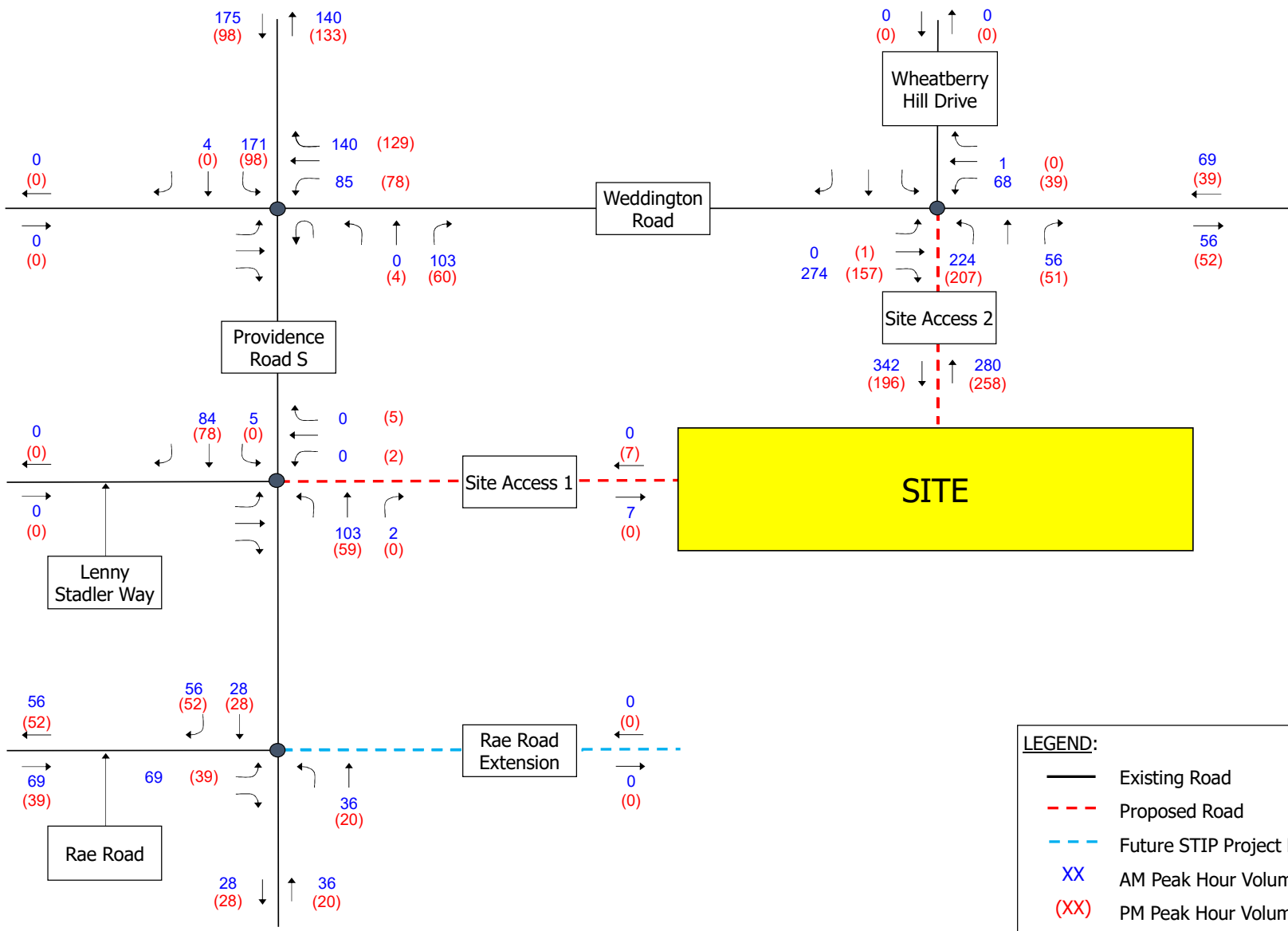
**LEGEND:**

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



**Weddington Classical Day School**  
**Traffic Impact Analysis**  
 Middle School Trip Distribution Volumes-Buses

Figure 4-3c



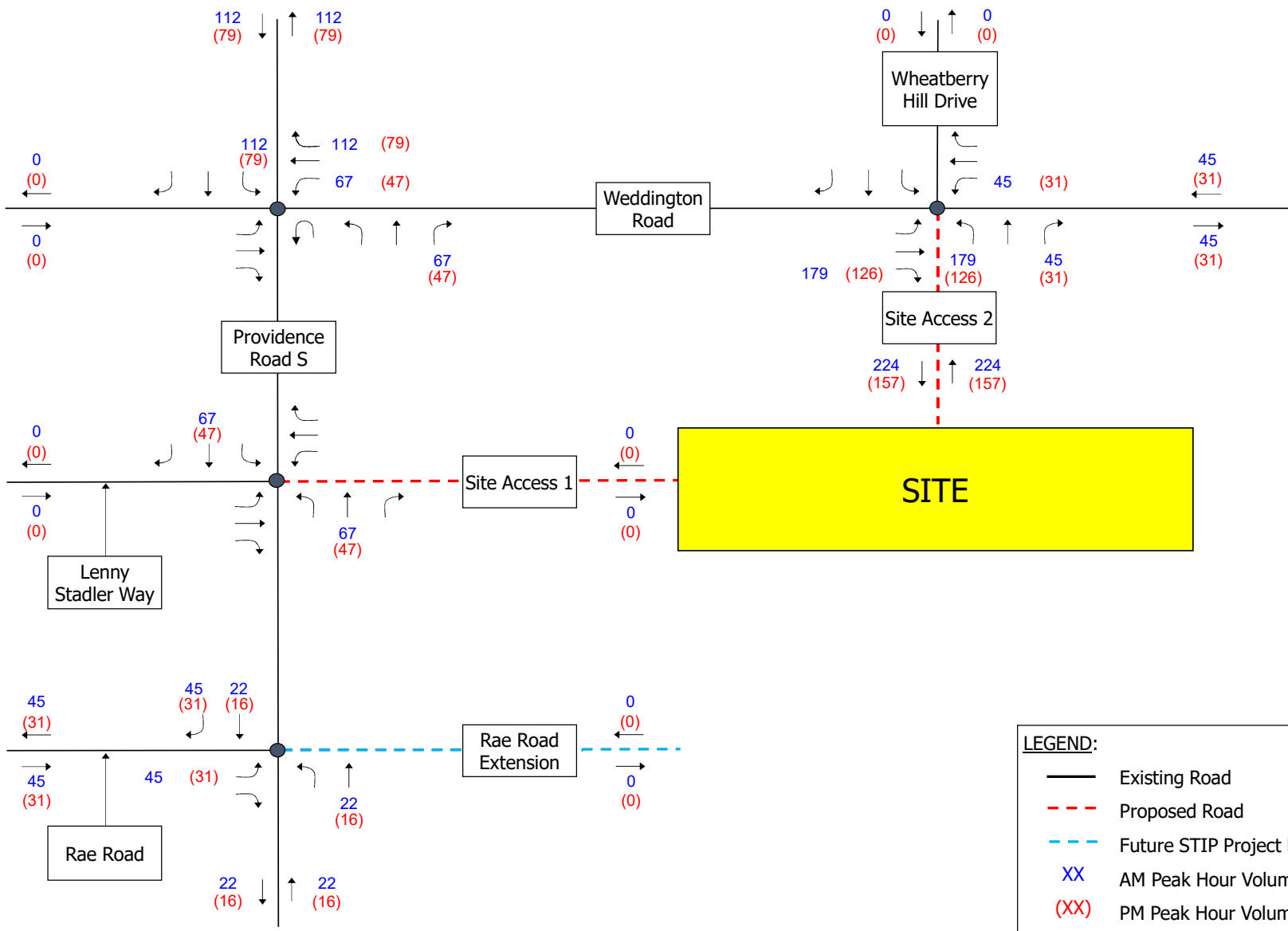
**LEGEND:**

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



**Weddington Classical Day School**  
**Traffic Impact Analysis**  
 Middle School Combined Trip Distribution Volumes

Figure 4-3d



**LEGEND:**

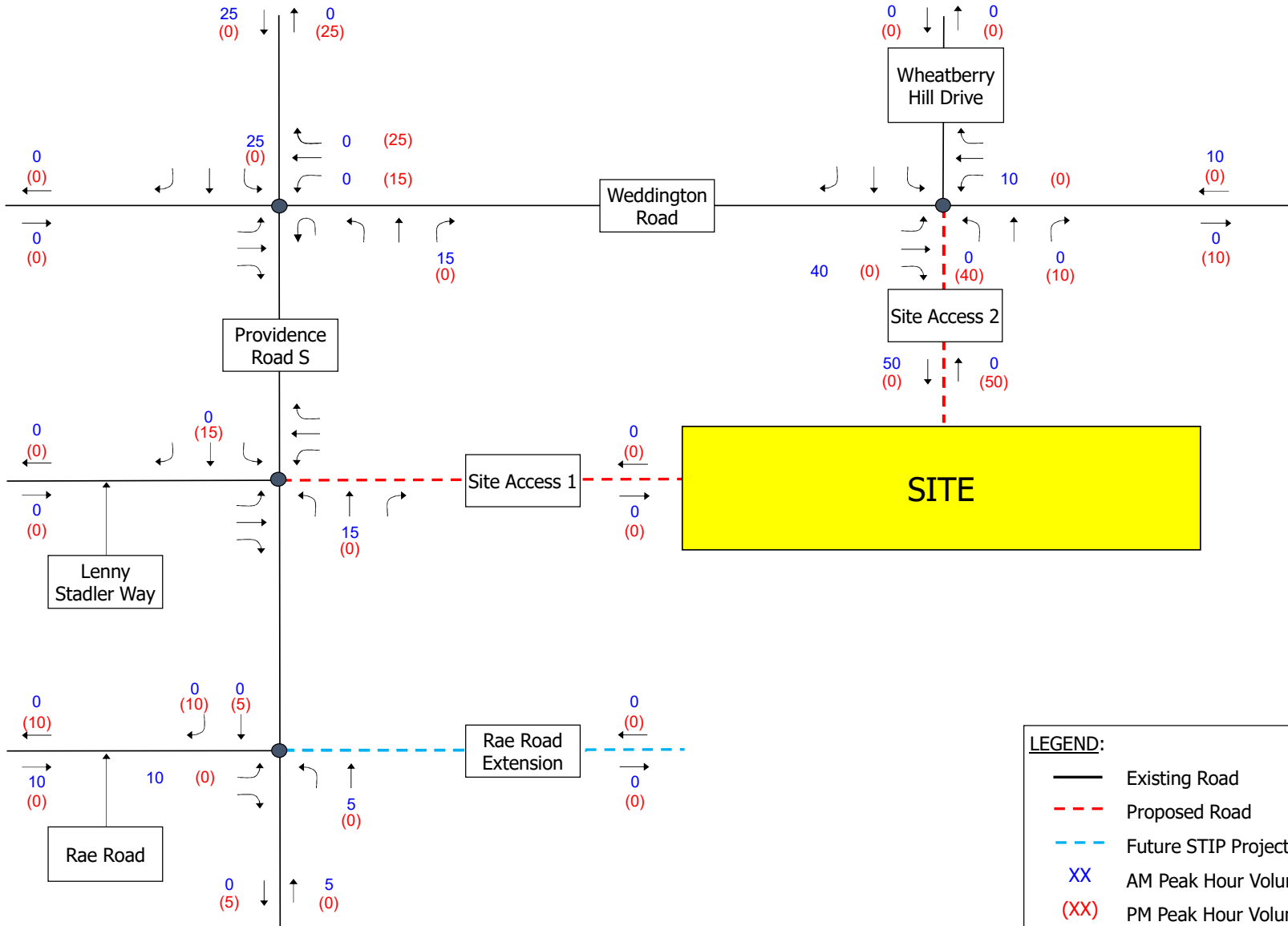
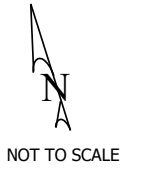
- Existing Road
- - - Proposed Road
- - - Future STIP Project Road
- XX AM Peak Hour Volume (vph)
- (XX) PM Peak Hour Volume (vph)



**Weddington Classical Day School**  
**Traffic Impact Analysis**  
 Elementary School Trip Distribution Volumes-Parents

Figure 4-4a





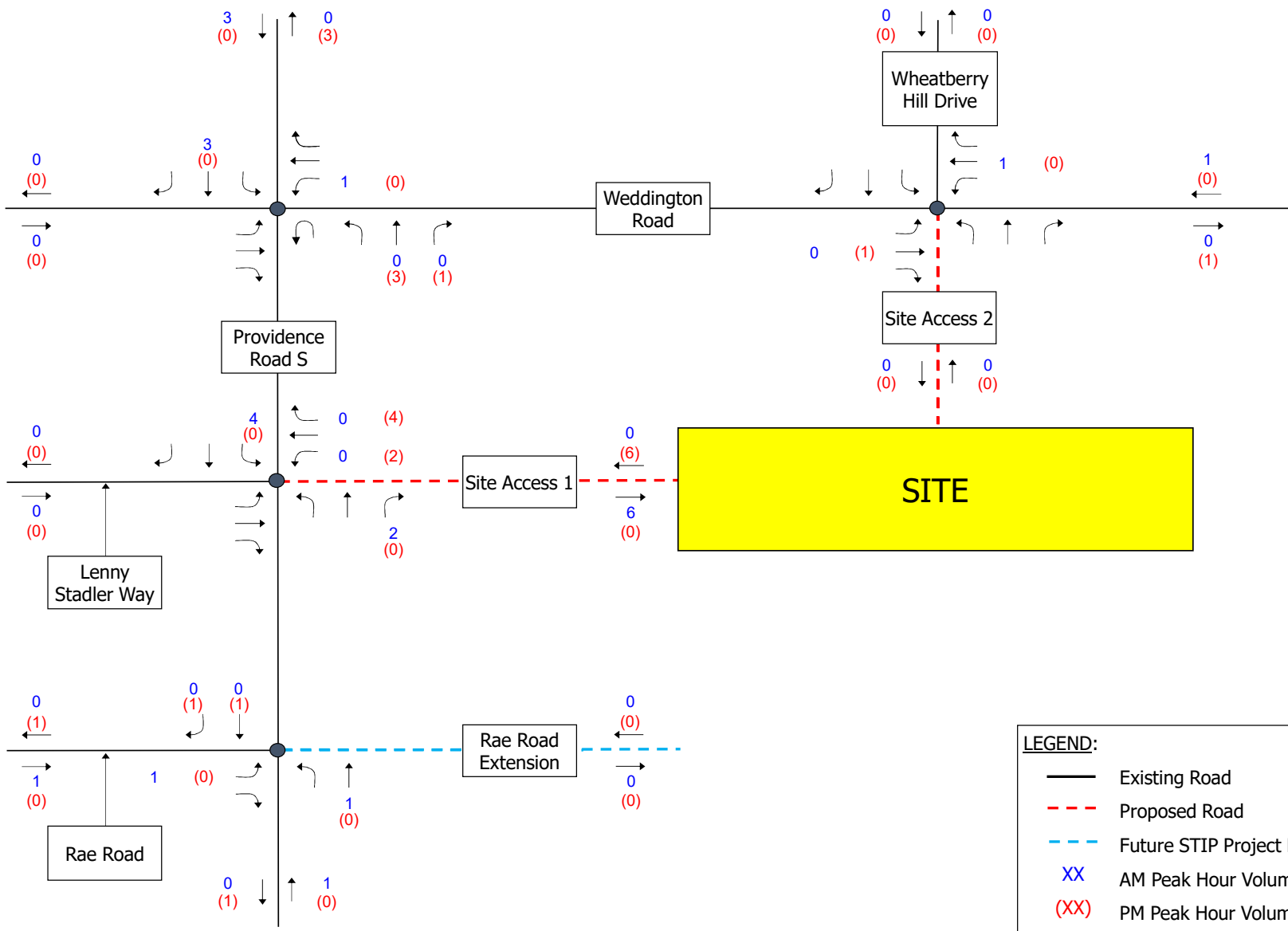
**LEGEND:**

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



**Weddington Classical Day School**  
**Traffic Impact Analysis**  
 Elementary School Trip Distribution Volumes-Staff

Figure 4-4b



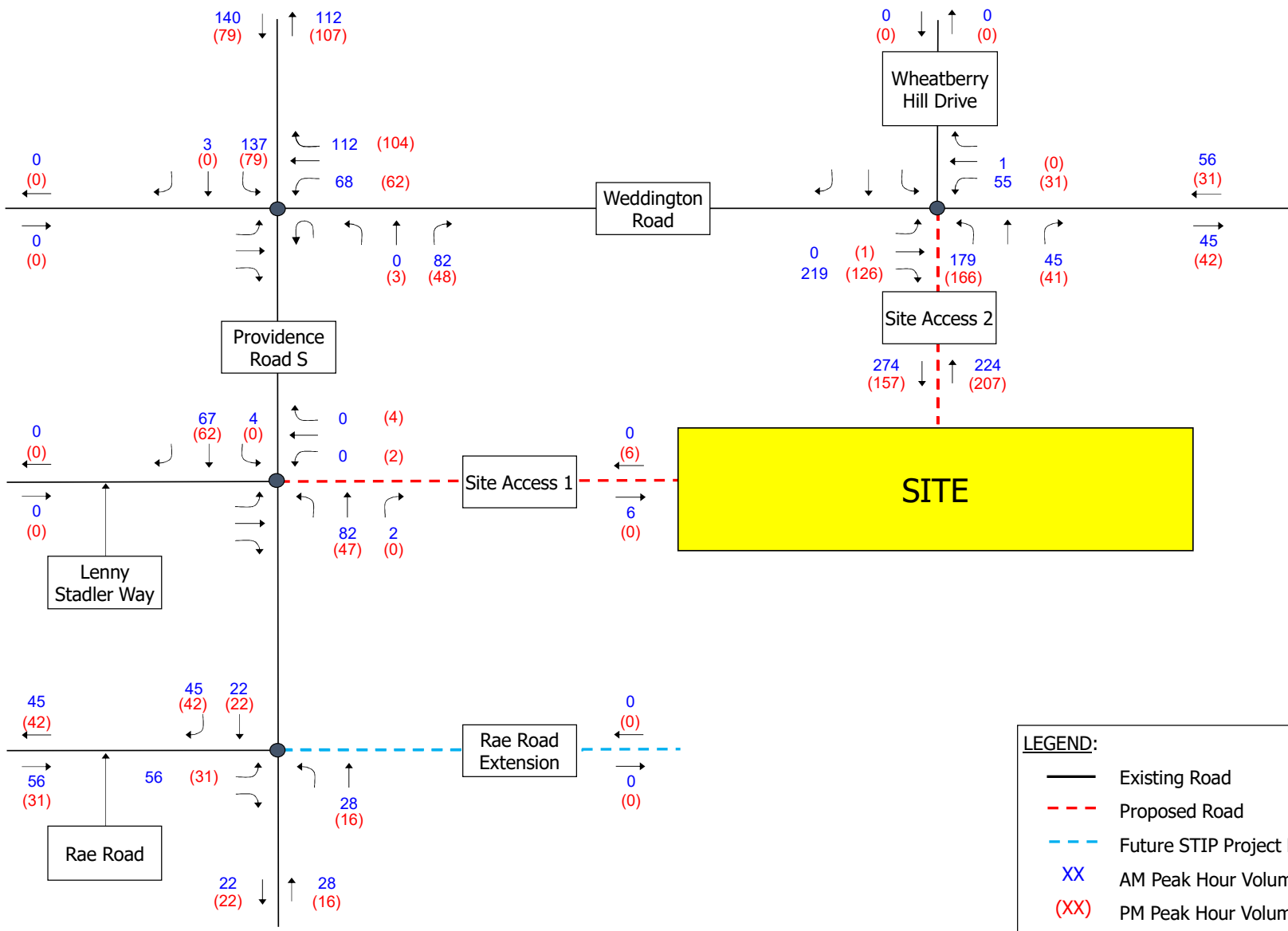
**LEGEND:**

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



**Weddington Classical Day School**  
**Traffic Impact Analysis**  
 Elementary School Trip Distribution Volumes-Buses

Figure 4-4c



**LEGEND:**

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



**Weddington Classical Day School**  
**Traffic Impact Analysis**  
 Elementary School Combined Trip Distribution Volumes

Figure 4-4d

**From:** [Jeff Hochanadel](#)  
**To:** [Helms, Amelia C](#); [Olson, David W](#); [Germiller, Tammy A](#)  
**Cc:** [Hunter Mullins](#); [Reese, Michael P](#); [Gardner, Zachary L](#); [Groundwater, Elise K](#); [Haire, Jonathan W](#); [Sanderson, Angela](#); [Weltner, Robert C](#); [Robert Tefft](#); [leah.wagner@volkert.com](mailto:leah.wagner@volkert.com); [nkb@cambridgeprop.com](mailto:nkb@cambridgeprop.com); [Jay Priestler](#); [George Maloomian](#); [Dan Thorn](#)  
**Subject:** RE: [External] RE: Weddington Classical Academy - D3: Weddington - Scope Resubmittal  
**Date:** Wednesday, April 19, 2023 11:48:00 AM  
**Attachments:** [image001.png](#)

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Thank you to everyone that met with this morning to discuss the subject project. I appreciate the input / conversation. Listed below are my meeting minutes / response to comments:

- The project name is officially Liberty Classical Academy. Moving forward, the TIA / analyses will use this name.
- Timmons Group reviewed the Draft High School, Middle School, and Elementary School TMPs with the group.
  - Plans included parent, teacher, (high school) student, and bus vehicular paths
    - Parents to enter / exit Weddington Road (NC-84)
    - High School Students to enter / exit Weddington Road (NC-84)
    - Teachers / Staff to enter / exit NC-16
    - Buses to enter / exit NC-16
  - Plans showed temporary parking lot access / internal road closures to occur during unloading / loading
  - Plans denoted high demand day vehicular stacking and showed how vehicles will be adequately stacked
    - Although not included in calculations, an additional ~950-feet of parent stacking exists between Weddington Road (NC-84) and the internal roundabout
      - This can be used on extreme queuing days
- Signs to be installed denoting that vehicles should not block the internal roundabout
- DRAFT improvement recommendations were discussed at each site access connection:
  - NC-84 / Site Access
    - Eastbound right-turn lane
    - Westbound left-turn lane
    - Monitor for signalization
  - NC-16 / Site Access
    - Southbound left-turn lane
- Timmons Group reviewed MSTA's provided comment list. Discussion / responses provided in red:
  - The angled bus parking will be difficult to exit. Are buses backing out or turning around? Neither is ideal.

Buses will pull into the bus parking lot, perform a three-point maneuver, then ultimately back into the bus parking spaces. Please note that the bus parking space dimensions are currently larger than needed. Ample room exists for the three-point maneuver to occur. A bus turning template will be included with the TIA submittal. It is imperative that the "hammer head" turn-around remain clear and that no bus parking be allowed in that location.

- There is a future drive noted to be connected in future to Weddington Road. Is the

school planning on buying that additional lot? What do they plan to do with it, and when? Connecting to the existing multi-lane tight radius roundabout will present problems.

The future drive connection in question has been removed. Liberty Classical Academy does not control the adjacent land parcel; thus, no roundabout connection can be made. Should the adjacent parcel be developed (by others), a fourth roundabout leg should be analyzed. Preliminary analyses noted future capacity concerns.

- Parallel parking of students/staff all around the queueing lines will be problematic. Many people have difficulties backing into those spots especially new drivers. This will be a complicated maneuver and will be time consuming thus creating delay and conflict points.

The development team will discuss the proposed parallel parking spaces. At the very least, this parking will be limited to Staff parking during school operations. No student parking will be allowed in the provided parallel parking spaces.

- Where are student driver's coming in? Are they coming in the same entrances and times as the parents?

High school students will enter the site off Weddington Road (NC-84), turn onto the proposed Private Access Road at the internal roundabout, then turn left into the northernmost parking lots.

- Bus pull-off on entrance road will add a level of confusion for all drivers. Especially for the ES where there are only two spots and the parent exit is directly there. This is a safety concern.

A staff member will be stationed between the Elementary School drop-off/pick-up exit and bus drop-off/pick-up to monitor vehicular flow. Alternative Elementary School drop-off / pick-up locations were discussed, but ultimately the current layout provides no pedestrian / vehicle interaction and allows students to exit / enter from the vehicle's right-side.

- HS Student parking lot in the middle has students crossing over what I assume will be the student driver path in and out. I am concerned about vehicle and pedestrian conflicts.

Timmons Group reviewed the high school student pedestrian path from the parking lot to the high school building. Pedestrian paths (and any associated temporary road blocks) will be denoted in the TMP.

- The path thru the parking lot near the Arts building can be used as a cut-thru by parents. It should be blocked off during loading/unloading operations.

This path will be temporarily blocked during drop-off / pick-up.

- Despite agreeing to a 45 minute stagger by the school, if it is not adhered to, a shared queue will result in confusion and stacking length reductions. The calculated queue length must be maintained on the campus and **the school has to enforce the 45 minute stagger.**

The 45-minute stagger will be clearly discussed / included in the TIA. Late arriving high school / middle school students should be dropped off in the bus unloading / loading zone (should

they arrive during elementary school AM peak). Other potential options to be discussed internally prior to TIA submittal.

- Loading zones should be denoted.

The unloading / loading zones will be clearly identified.

- There should be crosswalks and signing for where pedestrians are expected to be crossing over the parent queue, especially from parking lots.

Identified proposed pedestrian flows should avoid interaction with parent queues. Pedestrian paths will be identified in the TMP.

- Will there be students walking across the access road from the schools to the multi-use path? As this will be heavily traveled in the AM and PM, this could be a dangerous maneuver if not adequately addressed.

The site plan will note a pedestrian crossing from the high school parking lot to the multi-use fields.

---

**From:** Helms, Amelia C <achelms@ncdot.gov>

**Sent:** Monday, April 17, 2023 7:57 AM

**To:** Jeff Hochanadel <Jeff.Hochanadel@timmons.com>; Olson, David W <dwolson@ncdot.gov>; Germiller, Tammy A <tgermiller@ncdot.gov>

**Cc:** Hunter Mullins <Hunter.Mullins@timmons.com>; Reese, Michael P <mikereese@ncdot.gov>; Gardner, Zachary L <zlgardner@ncdot.gov>; Groundwater, Elise K <ekgroundwater@ncdot.gov>; Haire, Jonathan W <jwhaire@ncdot.gov>; Sanderson, Angela <amsanderson@ncdot.gov>; Weltner, Robert C <rcweltner@ncdot.gov>; Robert Tefft <rtefft@townofweddington.com>; Leah Wagner <leah.wagner@volkert.com>; NKB <nkb@cambridgeprop.com>; Jay Priester <jjp@cambridgeprop.com>; George Maloomian <glm@cambridgeprop.com>; Dan Thorn <cdt@cambridgeprop.com>

**Subject:** RE: [External] RE: Weddington Classical Academy - D3: Weddington - Scope Resubmittal

Jeff,

I apologize for the delay. Please see the comments below and attached. If you have questions, just let me know.

#### MSTA

- All my comments were addressed except for the site plan, for which an old version had been inadvertently submitted. These are basically some of the same comments sent previously on 2/27/23.
- Revised site plan comments:
  - The angled bus parking will be difficult to exit. Are buses backing out or turning around? Neither is ideal.
  - There is a future drive noted to be connected in future to Weddington Road. Is the school planning on buying that additional lot? What do they plan to do with it, and when? Connecting to the existing multi-lane tight radius roundabout will present problems.
  - Parallel parking of students/staff all around the queueing lines will be problematic. Many

people have difficulties backing into those spots especially new drivers. This will be a complicated maneuver and will be time consuming thus creating delay and conflict points.

- Where are student driver's coming in? Are they coming in the same entrances and times as the parents?
- Bus pull-off on entrance road will add a level of confusion for all drivers. Especially for the ES where there are only two spots and the parent exit is directly there. This is a safety concern.
- HS Student parking lot in the middle has students crossing over what I assume will be the student driver path in and out. I am concerned about vehicle and pedestrian conflicts.
- The path thru the parking lot near the Arts building can be used as a cut-thru by parents. It should be blocked off during loading/unloading operations.
- Despite agreeing to a 45 minute stagger by the school, if it is not adhered to, a shared queue will result in confusion and stacking length reductions. The calculated queue length must be maintained on the campus and **the school has to enforce the 45 minute stagger.**
- Loading zones should be denoted.
- There should be crosswalks and signing for where pedestrians are expected to be crossing over the parent queue, especially from parking lots.
- Will there be students walking across the access road from the schools to the multi-use path? As this will be heavily traveled in the AM and PM, this could be a dangerous maneuver if not adequately addressed.

CMS (David Olson)

- See attached.

Thank you,

**Amelia Helms, P.E.**

Division 10 - District 3

North Carolina Department of Transportation

704 218 5100 office

704 292 1800 fax

[achelms@ncdot.gov](mailto:achelms@ncdot.gov)

130 South Sutherland Avenue

Monroe, NC 28112



*Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties.*

---

**From:** Jeff Hochanadel <[Jeff.Hochanadel@timmons.com](mailto:Jeff.Hochanadel@timmons.com)>

**Sent:** Friday, April 14, 2023 4:11 PM

**To:** Helms, Amelia C <[achelms@ncdot.gov](mailto:achelms@ncdot.gov)>; Olson, David W <[dwolson@ncdot.gov](mailto:dwolson@ncdot.gov)>; Germiller, Tammy A <[tgermiller@ncdot.gov](mailto:tgermiller@ncdot.gov)>

**Cc:** Hunter Mullins <[Hunter.Mullins@timmons.com](mailto:Hunter.Mullins@timmons.com)>; Reese, Michael P <[mikereese@ncdot.gov](mailto:mikereese@ncdot.gov)>; Gardner, Zachary L <[zlgardner@ncdot.gov](mailto:zlgardner@ncdot.gov)>; Groundwater, Elise K <[ekgroundwater@ncdot.gov](mailto:ekgroundwater@ncdot.gov)>; Haire, Jonathan W <[jwhaire@ncdot.gov](mailto:jwhaire@ncdot.gov)>; Sanderson, Angela <[amsanderson@ncdot.gov](mailto:amsanderson@ncdot.gov)>; Weltner, Robert C <[rcweltner@ncdot.gov](mailto:rcweltner@ncdot.gov)>; Robert Tefft <[rtefft@townofweddington.com](mailto:rtefft@townofweddington.com)>; [leah.wagner@volkert.com](mailto:leah.wagner@volkert.com); [nkb@cambridgeprop.com](mailto:nkb@cambridgeprop.com); Jay Priester <[jjp@cambridgeprop.com](mailto:jjp@cambridgeprop.com)>; George Maloomian <[glm@cambridgeprop.com](mailto:glm@cambridgeprop.com)>; Dan Thorn <[cdt@cambridgeprop.com](mailto:cdt@cambridgeprop.com)>

**Subject:** [External] RE: Weddington Classical Academy - D3: Weddington - Scope Resubmittal

**CAUTION:** External email. Do not click links or open attachments unless you verify. Send all suspicious email as an attachment to [Report Spam](#).

All,

I wanted to follow up and check on the status of the (updated) TIA Scoping Checklist for the subject project.

Please let me know if you need any additional information from Timmons Group.

Thank You!

Jeff

---

**From:** Jeff Hochanadel <[Jeff.Hochanadel@timmons.com](mailto:Jeff.Hochanadel@timmons.com)>

**Sent:** Monday, March 20, 2023 1:00 PM

**To:** Helms, Amelia C <[achelms@ncdot.gov](mailto:achelms@ncdot.gov)>; Olson, David W <[dwolson@ncdot.gov](mailto:dwolson@ncdot.gov)>; Germiller, Tammy A <[tgermiller@ncdot.gov](mailto:tgermiller@ncdot.gov)>

**Cc:** Hunter Mullins <[Hunter.Mullins@timmons.com](mailto:Hunter.Mullins@timmons.com)>; Reese, Michael P <[mikereese@ncdot.gov](mailto:mikereese@ncdot.gov)>; Gardner, Zachary L <[zlgardner@ncdot.gov](mailto:zlgardner@ncdot.gov)>; Groundwater, Elise K <[ekgroundwater@ncdot.gov](mailto:ekgroundwater@ncdot.gov)>; Haire, Jonathan W <[jwhaire@ncdot.gov](mailto:jwhaire@ncdot.gov)>; Sanderson, Angela <[amsanderson@ncdot.gov](mailto:amsanderson@ncdot.gov)>; Weltner, Robert C <[rcweltner@ncdot.gov](mailto:rcweltner@ncdot.gov)>; Robert Tefft <[rtefft@townofweddington.com](mailto:rtefft@townofweddington.com)>; [leah.wagner@volkert.com](mailto:leah.wagner@volkert.com); [nkb@cambridgeprop.com](mailto:nkb@cambridgeprop.com); Jay Priester <[jjp@cambridgeprop.com](mailto:jjp@cambridgeprop.com)>; George Maloomian <[glm@cambridgeprop.com](mailto:glm@cambridgeprop.com)>; Dan Thorn <[cdt@cambridgeprop.com](mailto:cdt@cambridgeprop.com)>

**Subject:** RE: Weddington Classical Academy - D3: Weddington - Scope Resubmittal

All,

Please see the attached (updated) TIA Scoping Checklist. I have included my response to comments in **red** below. Do not hesitate to contact me with any questions or should any additional information



be needed.

Thank You!

Jeff

### MSTA

- **When is the commercial development being studied?** Is that in this TIA for the horizon year? Development needs to be included but the school broken out. **Need to see improvements needed just for the school, then just for the commercial development.** How it is written in the TIA is a bit confusing if you intended the commercial development to be here. Even if the school is not seeking reimbursement (as per Jeff H. email on 2/20/23), we need to look at NCDOT required improvements that can be reimbursable under the school statute.

The commercial development is no longer planned for the subject development. All commercial square-footage has been removed.

- Page 2 of 2. Check box that TIA is required by NCDOT??

The TIA Scoping Checklist was updated accordingly.

- Page 1 of 7. Check box for internal school circulation analysis

The TIA Scoping Checklist was updated accordingly.

- Page 4 of 7. Study intersections. Remove intersection #4 from analysis. Weddington at Weddington Matthews is a roundabout. Under school reimbursement funding this would be unchangeable, and a 2 lane roundabout is never really a good option.

Intersection #4 has been removed from the TIA Scoping Checklist / analyses.

- Page 6 of 7. Check box for School Loading zone Traffic Simulation.

The TIA Scoping Checklist was updated accordingly.

- Page 6 of 7. Submittals. Check boxes for Div Traffic Eng, and Regional Traffic Engr.

The TIA Scoping Checklist was updated accordingly.

- Staggering must be a minimum of 45 minutes between schools, and there needs to be a Transportation Management Plan (TMP).

Understood. Bells will be staggered by 45 minutes. A Transportation Management Plan will be provided with the TIA submittal.

- Site plan

An older version of the site plan was inadvertently attached to the 3/03/23 TIA Scoping Checklist submittal. An updated site plan is attached to the TIA Scoping Checklist.

- Where are student drivers coming in?

Student drivers will approach the school from Weddington Road.

- What are the entering/existing parent paths for each school? They appear as they may be short.

Parents will approach / depart the school from Weddington Road. Adequate stacking has been provided from the on-campus roundabout to the designated pick-up/drop-off zones. The MSTA School Calculator projected queue lengths are attached to the TIA Scoping Checklist.

- Short term visitor parking should be accessible after each loading zone for students requiring additional time to load.

Short term parking has been identified after each loading zone. Please see the attached site plan.

Buses? Where do they load/unload/park? Buses should not be mixed in with parent/student traffic.

Buses will approach / depart the school from NC-16. Bus pick-up / drop-off zones have been identified on the attached site plan.

- A singular ingress/egress will be problematic for many reasons. Typically, an ingress with a separate egress is preferred by MSTA. Also note this access will be shared with a lot of commercial enterprise.

Understood. To accommodate projected on-site queues and help with on-site circulation, all parent / student traffic will enter / exit from Weddington Road. As previously mentioned, the commercial development is no longer planned. All commercial square-footage has been removed. All onsite traffic will be school related.

- Why was the access to Weddington considered only as Potential? Wasn't there an access at one point? Why are we studying if there will not be a driveway here? There will be a lot of traffic forced onto the one access now at Providence road. This is not ideal and by doing so it does not necessarily force NCDOT to install traffic signal.

The "potential" label has been removed.

CM:

- See Attached

Trip Generation

- The commercial development is no longer planned for the subject development. All commercial square-footage has been removed.
- Understood.

Trip Distribution and Growth

- The proposed trip distribution figure is attached to the TIA Scoping Checklist.
- A 2.5% ambient growth factor will be used for all analyses. Due to limitations with the TIA Scoping Checklist, Timmons Group is unable to show this percentage in the Annual Growth Factor blank. 2.5% is noted in the "Justification / Data Source" line below.

Study Intersections

- The proposed trip distribution figure is attached to the TIA Scoping Checklist.

Site Plan and Proposed Driveways

- Understood. The proposed access connection to NC-16 will be opposite Lenny Stadler Way. This intersection is currently a signalized full movement intersection. Does the NCDOT desire the signal to be removed / modified?
- Understood. Turn-lanes will likely be needed at all site access points to facilitate projected traffic.
- The commercial development is no longer planned for the subject development. All commercial square-footage has been removed.
- Understood.

---

**From:** Helms, Amelia C <[achelms@ncdot.gov](mailto:achelms@ncdot.gov)>

**Sent:** Friday, March 17, 2023 4:49 PM

**To:** Jeff Hochanadel <[Jeff.Hochanadel@timmons.com](mailto:Jeff.Hochanadel@timmons.com)>; Olson, David W <[dwolson@ncdot.gov](mailto:dwolson@ncdot.gov)>;

Germiller, Tammy A <[tgermiller@ncdot.gov](mailto:tgermiller@ncdot.gov)>

**Cc:** Hunter Mullins <[Hunter.Mullins@timmons.com](mailto:Hunter.Mullins@timmons.com)>; Reese, Michael P <[mikereese@ncdot.gov](mailto:mikereese@ncdot.gov)>; Gardner, Zachary L <[zlgardner@ncdot.gov](mailto:zlgardner@ncdot.gov)>; Groundwater, Elise K <[ekgroundwater@ncdot.gov](mailto:ekgroundwater@ncdot.gov)>; Cliff Lawson <[cliff.lawson@timmons.com](mailto:cliff.lawson@timmons.com)>; Haire, Jonathan W <[jwhaire@ncdot.gov](mailto:jwhaire@ncdot.gov)>; Sanderson, Angela <[amsanderson@ncdot.gov](mailto:amsanderson@ncdot.gov)>; Weltner, Robert C <[rcweltner@ncdot.gov](mailto:rcweltner@ncdot.gov)>; Robert Tefft <[rtefft@townofweddington.com](mailto:rtefft@townofweddington.com)>; [leah.wagner@volkert.com](mailto:leah.wagner@volkert.com); [nkb@cambridgeprop.com](mailto:nkb@cambridgeprop.com); Jay Priester <[jjp@cambridgeprop.com](mailto:jjp@cambridgeprop.com)>; George Maloomian <[glm@cambridgeprop.com](mailto:glm@cambridgeprop.com)>; Dan Thorn <[cdt@cambridgeprop.com](mailto:cdt@cambridgeprop.com)>

**Subject:** Weddington Classical Academy - D3: Weddington - Scope Resubmittal

Jeff,

Good afternoon! Please see NCDOT's comments below, as well as attached, for the scope resubmitted on 3/3/23. If you have any questions, please let me know.

### MSTA

- **When is the commercial development being studied?** Is that in this TIA for the horizon year? Development needs to be included but the school broken out. **Need to see improvements needed just for the school, then just for the commercial development.** How it is written in the TIA is a bit confusing if you intended the commercial development to be here. Even if the school is not seeking reimbursement (as per Jeff H. email on 2/20/23), we need to look at NCDOT required improvements that can be reimbursable under the school statute.
- Page 2 of 2. Check box that TIA is required by NCDOT??
- Page 1 of 7. Check box for internal school circulation analysis
- Page 4 of 7. Study intersections. Remove intersection #4 from analysis. Weddington at Weddington Matthews is a roundabout. Under school reimbursement funding this would be unchangeable, and a 2 lane roundabout is never really a good option.
- Page 6 of 7. Check box for School Loading zone Traffic Simulation.
- Page 6 of 7. Submittals. Check boxes for Div Traffic Eng, and Regional Traffic Engr.
- Staggering must be a minimum of 45 minutes between schools, and there needs to be a Transportation Management Plan (TMP).
- Site plan
  - Where are student drivers coming in?
  - What are the entering/existing parent paths for each school? They appear as they may be short.
  - Short term visitor parking should be accessible after each loading zone for students requiring additional time to load.
  - Buses? Where do they load/unload/park? Buses should not be mixed in with parent/student traffic.
  - A singular ingress/egress will be problematic for many reasons. Typically, an ingress with a separate egress is preferred by MSTA. Also note this access will be shared with a lot of commercial enterprise.
  - Why was the access to Weddington considered only as Potential? Wasn't there an access at one point? Why are we studying if there will not be a driveway here? There will be a lot of traffic forced onto the one access now at Providence road. This is not

ideal and by doing so it does not necessarily force NCDOT to install traffic signal.

CM:

- See Attached

Thank you,

**Amelia Helms, P.E.**  
Division 10 - District 3  
North Carolina Department of Transportation

704 218 5100 office  
704 292 1800 fax  
[achelms@ncdot.gov](mailto:achelms@ncdot.gov)

130 South Sutherland Avenue  
Monroe, NC 28112



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---

**From:** Jeff Hochanadel <[Jeff.Hochanadel@timmons.com](mailto:Jeff.Hochanadel@timmons.com)>

**Sent:** Friday, March 3, 2023 10:32 AM

**To:** Olson, David W <[dwolson@ncdot.gov](mailto:dwolson@ncdot.gov)>; Germiller, Tammy A <[tgermiller@ncdot.gov](mailto:tgermiller@ncdot.gov)>; Helms, Amelia C <[achelms@ncdot.gov](mailto:achelms@ncdot.gov)>

**Cc:** Hunter Mullins <[Hunter.Mullins@timmons.com](mailto:Hunter.Mullins@timmons.com)>; Reese, Michael P <[mikereese@ncdot.gov](mailto:mikereese@ncdot.gov)>; Gardner, Zachary L <[zlgardner@ncdot.gov](mailto:zlgardner@ncdot.gov)>; Groundwater, Elise K <[ekgroundwater@ncdot.gov](mailto:ekgroundwater@ncdot.gov)>; Cliff Lawson <[cliff.lawson@timmons.com](mailto:cliff.lawson@timmons.com)>; Haire, Jonathan W <[jwhaire@ncdot.gov](mailto:jwhaire@ncdot.gov)>; Sanderson, Angela <[amsanderson@ncdot.gov](mailto:amsanderson@ncdot.gov)>; Weltner, Robert C <[rcweltner@ncdot.gov](mailto:rcweltner@ncdot.gov)>; Robert Tefft <[rtefft@townofweddington.com](mailto:rtefft@townofweddington.com)>; [leah.wagner@volkert.com](mailto:leah.wagner@volkert.com); [nkb@cambridgeprop.com](mailto:nkb@cambridgeprop.com); Jay Priester <[jjp@cambridgeprop.com](mailto:jjp@cambridgeprop.com)>; George Maloomian <[glm@cambridgeprop.com](mailto:glm@cambridgeprop.com)>; Dan Thorn <[cdt@cambridgeprop.com](mailto:cdt@cambridgeprop.com)>

**Subject:** RE: [External] FW: Weddington TIA Scoping Meeting Minutes (12/02/22)

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All,

Attached is the updated TIA Scoping Checklist for the subject project. We are obviously open to meeting and discussing the attached as needed. Please let me know.

Thank You!  
Jeff

## Jeff Hochanadel, PE, PTOE

Principal | North Carolina Transportation Group Leader

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[jeff.hochanadel@timmons.com](mailto:jeff.hochanadel@timmons.com)

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**From:** Olson, David W <[dwolson@ncdot.gov](mailto:dwolson@ncdot.gov)>

**Sent:** Monday, February 27, 2023 3:14 PM

**To:** Jeff Hochanadel <[Jeff.Hochanadel@timmons.com](mailto:Jeff.Hochanadel@timmons.com)>; Germiller, Tammy A <[tgermiller@ncdot.gov](mailto:tgermiller@ncdot.gov)>; Helms, Amelia C <[achelms@ncdot.gov](mailto:achelms@ncdot.gov)>

**Cc:** Hunter Mullins <[Hunter.Mullins@timmons.com](mailto:Hunter.Mullins@timmons.com)>; Reese, Michael P <[mikereese@ncdot.gov](mailto:mikereese@ncdot.gov)>; Gardner, Zachary L <[zlgardner@ncdot.gov](mailto:zlgardner@ncdot.gov)>; Groundwater, Elise K <[ekgroundwater@ncdot.gov](mailto:ekgroundwater@ncdot.gov)>; Cliff Lawson <[cliff.lawson@timmons.com](mailto:cliff.lawson@timmons.com)>; Haire, Jonathan W <[jwhaire@ncdot.gov](mailto:jwhaire@ncdot.gov)>; Sanderson, Angela <[amsanderson@ncdot.gov](mailto:amsanderson@ncdot.gov)>; Weltner, Robert C <[rcweltner@ncdot.gov](mailto:rcweltner@ncdot.gov)>; Robert Tefft <[rtefft@townofweddington.com](mailto:rtefft@townofweddington.com)>; [leah.wagner@volkert.com](mailto:leah.wagner@volkert.com); [nkb@cambridgeprop.com](mailto:nkb@cambridgeprop.com); Jay Priester <[jjp@cambridgeprop.com](mailto:jjp@cambridgeprop.com)>; George Maloomian <[glm@cambridgeprop.com](mailto:glm@cambridgeprop.com)>; Dan Thorn <[cdt@cambridgeprop.com](mailto:cdt@cambridgeprop.com)>

**Subject:** RE: [External] FW: Weddington TIA Scoping Meeting Minutes (12/02/22)

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Jeff,

I have no objection to submitting the revised scope without a meeting, so long as such is OK with MSTA (Tammy Germiller) and the new district engineer (Amelia Helms).

David W. Olson, P.E.

Congestion Management Project Design Engineer, Western Region

Traffic Management Unit  
North Carolina Department of Transportation

(470) 241-4227 cell  
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Garner, NC 27529-6949

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**From:** Jeff Hochanadel <[Jeff.Hochanadel@timmons.com](mailto:Jeff.Hochanadel@timmons.com)>  
**Sent:** Monday, February 27, 2023 1:35 PM  
**To:** Germiller, Tammy A <[tgermiller@ncdot.gov](mailto:tgermiller@ncdot.gov)>; Haire, Jonathan W <[jwhaire@ncdot.gov](mailto:jwhaire@ncdot.gov)>; Sanderson, Angela <[amsanderson@ncdot.gov](mailto:amsanderson@ncdot.gov)>; Weltner, Robert C <[rcweltner@ncdot.gov](mailto:rcweltner@ncdot.gov)>; Robert Tefft <[rtefft@townofweddington.com](mailto:rtefft@townofweddington.com)>; [leah.wagner@volkert.com](mailto:leah.wagner@volkert.com); [nkb@cambridgeprop.com](mailto:nkb@cambridgeprop.com); Jay Priester <[jjp@cambridgeprop.com](mailto:jjp@cambridgeprop.com)>; George Maloomian <[glm@cambridgeprop.com](mailto:glm@cambridgeprop.com)>; Dan Thorn <[cdt@cambridgeprop.com](mailto:cdt@cambridgeprop.com)>  
**Cc:** Hunter Mullins <[Hunter.Mullins@timmons.com](mailto:Hunter.Mullins@timmons.com)>; Reese, Michael P <[mikereese@ncdot.gov](mailto:mikereese@ncdot.gov)>; Gardner, Zachary L <[zlgardner@ncdot.gov](mailto:zlgardner@ncdot.gov)>; Olson, David W <[dwolson@ncdot.gov](mailto:dwolson@ncdot.gov)>; Groundwater, Elise K <[ekgroundwater@ncdot.gov](mailto:ekgroundwater@ncdot.gov)>; Cliff Lawson <[cliff.lawson@timmons.com](mailto:cliff.lawson@timmons.com)>  
**Subject:** [External] FW: Weddington TIA Scoping Meeting Minutes (12/02/22)

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All,

I wanted to follow up again and check on the email below.

Please let me know if a new TIA scoping meeting will be required or if we can submit the Checklist in lieu of this meeting.

Thank You!  
Jeff

---

**From:** Jeff Hochanadel  
**Sent:** Monday, February 20, 2023 12:57 PM  
**To:** 'Germiller, Tammy A' <[tgermiller@ncdot.gov](mailto:tgermiller@ncdot.gov)>; 'Haire, Jonathan W' <[jwhaire@ncdot.gov](mailto:jwhaire@ncdot.gov)>; 'Sanderson, Angela' <[amsanderson@ncdot.gov](mailto:amsanderson@ncdot.gov)>; 'Weltner, Robert C' <[rcweltner@ncdot.gov](mailto:rcweltner@ncdot.gov)>; 'Robert Tefft' <[rtefft@townofweddington.com](mailto:rtefft@townofweddington.com)>; 'leah.wagner@volkert.com' <[leah.wagner@volkert.com](mailto:leah.wagner@volkert.com)>; 'nkb@cambridgeprop.com' <[nkb@cambridgeprop.com](mailto:nkb@cambridgeprop.com)>; 'Jay Priester'

<[jjp@cambridgeprop.com](mailto:jjp@cambridgeprop.com)>; 'George Maloomian' <[glm@cambridgeprop.com](mailto:glm@cambridgeprop.com)>; 'Dan Thorn' <[cdt@cambridgeprop.com](mailto:cdt@cambridgeprop.com)>

**Cc:** Hunter Mullins <[Hunter.Mullins@timmons.com](mailto:Hunter.Mullins@timmons.com)>; 'mikereese@ncdot.gov' <[mikereese@ncdot.gov](mailto:mikereese@ncdot.gov)>; 'Gardner, Zachary L' <[zlgardner@ncdot.gov](mailto:zlgardner@ncdot.gov)>; 'Olson, David W' <[dwolson@ncdot.gov](mailto:dwolson@ncdot.gov)>; 'Groundwater, Elise K' <[ekgroundwater@ncdot.gov](mailto:ekgroundwater@ncdot.gov)>; Cliff Lawson <[Cliff.Lawson@timmons.com](mailto:Cliff.Lawson@timmons.com)>

**Subject:** RE: Weddington TIA Scoping Meeting Minutes (12/02/22)

All,

Since our 12/02/22 scoping meeting (see attached meeting minutes), there have been several changes to the proposed Weddington Classical Academy Development. Because of this, the subject TIA needs to be rescoped. I will be happy to rescope this project via email. I will also be happy to set up another meeting to discuss the subject project (as needed).

I have listed a brief summary of changes below:

- Removed proposed commercial square footage
- Reduced student population to 1,500 students
  - 600 high school students
  - 500 middle school students
  - 400 elementary school students
- Updated site layout (to more closely meet MSTA standards)
- Better defined parent / teacher / student / bus approach and departure
- No longer seeking NCDOT reimbursement

I will be happy to submit an updated NCDOT TIA Scoping Checklist prior to, or in lieu of, a scoping meeting.

Thank You!

Jeff

## **Jeff Hochanadel, PE, PTOE**

Principal | North Carolina Transportation Group Leader

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---

**From:** Jeff Hochanadel

**Sent:** Tuesday, December 6, 2022 10:02 AM

**To:** Germiller, Tammy A <[tgermiller@ncdot.gov](mailto:tgermiller@ncdot.gov)>; Haire, Jonathan W <[jwhaire@ncdot.gov](mailto:jwhaire@ncdot.gov)>; Sanderson, Angela <[amsanderson@ncdot.gov](mailto:amsanderson@ncdot.gov)>; Weltner, Robert C <[rcweltner@ncdot.gov](mailto:rcweltner@ncdot.gov)>; 'Robert Tefft' <[rtefft@townofweddington.com](mailto:rtefft@townofweddington.com)>; [leah.wagner@volkert.com](mailto:leah.wagner@volkert.com); [nkb@cambridgeprop.com](mailto:nkb@cambridgeprop.com); Jay Priester <[jjp@cambridgeprop.com](mailto:jjp@cambridgeprop.com)>; George Maloomian <[glm@cambridgeprop.com](mailto:glm@cambridgeprop.com)>; Dan Thorn <[cdt@cambridgeprop.com](mailto:cdt@cambridgeprop.com)>

**Cc:** Hunter Mullins <[Hunter.Mullins@timmons.com](mailto:Hunter.Mullins@timmons.com)>; [mikereese@ncdot.gov](mailto:mikereese@ncdot.gov); Gardner, Zachary L <[zlgardner@ncdot.gov](mailto:zlgardner@ncdot.gov)>; Olson, David W <[dwolson@ncdot.gov](mailto:dwolson@ncdot.gov)>; Groundwater, Elise K <[ekgroundwater@ncdot.gov](mailto:ekgroundwater@ncdot.gov)>; Cliff Lawson <[Cliff.Lawson@timmons.com](mailto:Cliff.Lawson@timmons.com)>

**Subject:** Weddington TIA Scoping Meeting Minutes (12/02/22)

All,

Attached are the Weddington Classical Academy TIA Scoping Meeting Minutes. Please review the attached document and let me know if you have any questions or comments.

We are currently finalizing the NCDOT's TIA Scoping Checklist for the subject project. Once this document is complete, I will submit it for review / comment.

If I have inadvertently excluded anyone from this email distribution list, please do not hesitate to forward this email to them.

Thank You!

Jeff

## **Jeff Hochanadel, PE, PTOE**

Principal | North Carolina Transportation Group Leader

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## **Appendix B – Traffic Counts**



TRAFFIC DATA COLLECTION

File Name : Weddington(NC 84 and Wheatberry Hill)  
 Site Code :  
 Start Date : 1/12/2023  
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Wheatberry Hill Drive Southbound			NC 84 Westbound			NC 84 Eastbound			Int. Total
	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	
07:00 AM	0	0	0	1	76	77	30	0	30	107
07:05 AM	3	1	4	1	52	53	27	0	27	84
07:10 AM	2	2	4	0	67	67	25	0	25	96
07:15 AM	0	0	0	0	63	63	34	0	34	97
07:20 AM	3	0	3	3	64	67	29	0	29	99
07:25 AM	0	1	1	0	57	57	24	0	24	82
07:30 AM	1	0	1	1	47	48	41	1	42	91
07:35 AM	0	1	1	2	52	54	47	0	47	102
07:40 AM	1	0	1	0	44	44	29	0	29	74
07:45 AM	0	1	1	1	41	42	35	0	35	78
07:50 AM	1	0	1	0	37	37	43	1	44	82
07:55 AM	0	0	0	0	50	50	30	0	30	80
Total	11	6	17	9	650	659	394	2	396	1072
08:00 AM	0	0	0	2	40	42	39	0	39	81
08:05 AM	1	0	1	0	40	40	31	1	32	73
08:10 AM	1	0	1	0	54	54	32	0	32	87
08:15 AM	0	0	0	1	55	56	29	0	29	85
08:20 AM	1	1	2	0	70	70	19	1	20	92
08:25 AM	0	0	0	1	62	63	33	1	34	97
08:30 AM	1	1	2	0	58	58	21	0	21	81
08:35 AM	1	1	2	0	50	50	34	0	34	86
08:40 AM	1	1	2	1	70	71	33	0	33	106
08:45 AM	3	0	3	1	63	64	36	0	36	103
08:50 AM	0	0	0	1	59	60	42	1	43	103
08:55 AM	1	1	2	0	65	65	28	1	29	96
Total	10	5	15	7	686	693	377	5	382	1090
Grand Total	21	11	32	16	1336	1352	771	7	778	2162
Apprch %	65.6	34.4		1.2	98.8		99.1	0.9		
Total %	1	0.5	1.5	0.7	61.8	62.5	35.7	0.3	36	
Cars +	21	11	32	15	1297	1312	744	7	751	2095
% Cars +	100	100	100	93.8	97.1	97	96.5	100	96.5	96.9
Trucks	0	0	0	1	39	40	27	0	27	67
% Trucks	0	0	0	6.2	2.9	3	3.5	0	3.5	3.1



TRAFFIC DATA COLLECTION

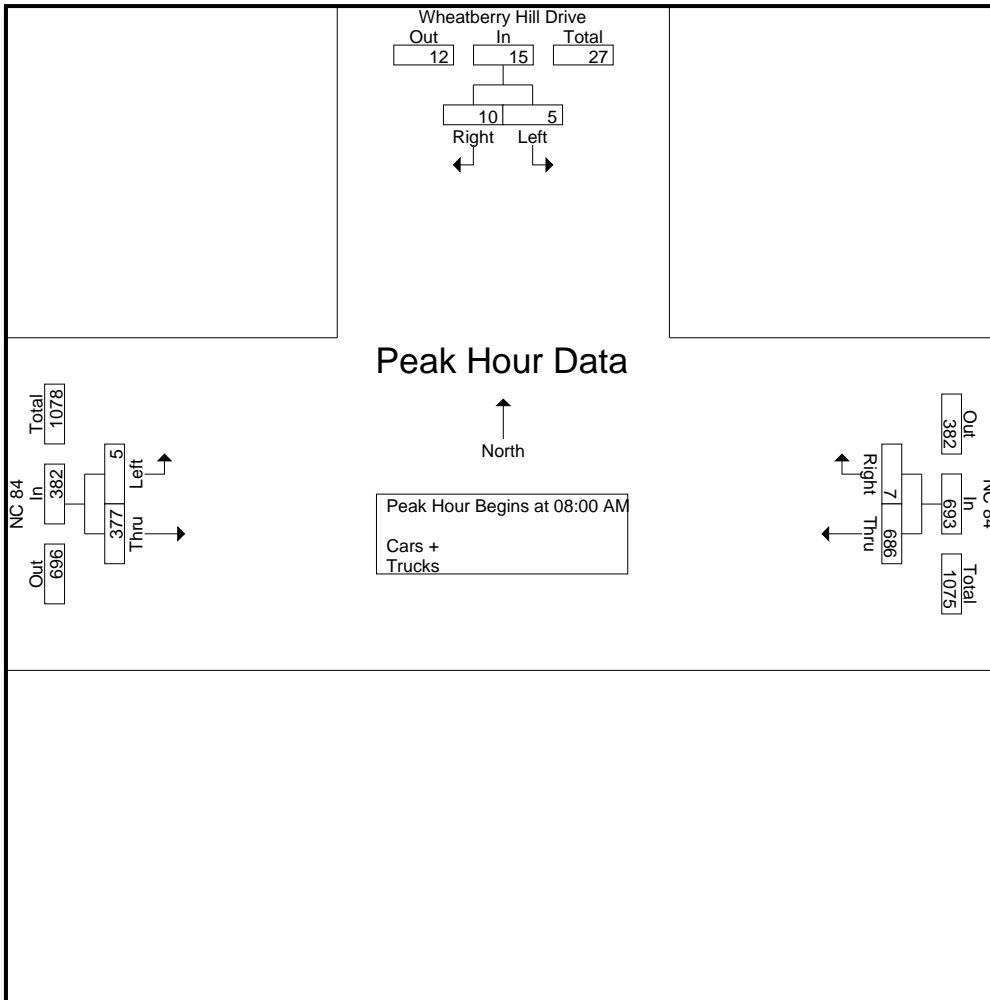
File Name : Weddington(NC 84 and Wheatberry Hill)  
 Site Code :  
 Start Date : 1/12/2023  
 Page No : 2

Start Time	Wheatberry Hill Drive Southbound			NC 84 Westbound			NC 84 Eastbound			Int. Total
	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:55 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	0	0	0	2	40	42	39	0	39	81
08:05 AM	1	0	1	0	40	40	31	1	32	73
08:10 AM	1	0	1	0	54	54	32	0	32	87
08:15 AM	0	0	0	1	55	56	29	0	29	85
08:20 AM	1	1	2	0	70	70	19	1	20	92
08:25 AM	0	0	0	1	62	63	33	1	34	97
08:30 AM	1	1	2	0	58	58	21	0	21	81
08:35 AM	1	1	2	0	50	50	34	0	34	86
08:40 AM	1	1	2	1	70	71	33	0	33	106
08:45 AM	3	0	3	1	63	64	36	0	36	103
08:50 AM	0	0	0	1	59	60	42	1	43	103
08:55 AM	1	1	2	0	65	65	28	1	29	96
Total Volume	10	5	15	7	686	693	377	5	382	1090
% App. Total	66.7	33.3		1	99		98.7	1.3		
PHF	.278	.417	.417	.292	.817	.813	.748	.417	.740	.857



TRAFFIC DATA COLLECTION

File Name : Weddington(NC 84 and Wheatberry Hill)  
 Site Code :  
 Start Date : 1/12/2023  
 Page No : 3





TRAFFIC DATA COLLECTION

File Name : Weddington(NC 84 and Wheatberry Hill)

Site Code :

Start Date : 1/12/2023

Page No : 1

Groups Printed- Cars + - Trucks

Start Time	Wheatberry Hill Drive Southbound			NC 84 Westbound			NC 84 Eastbound			Int. Total
	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	
02:00 PM	0	1	1	1	35	36	34	2	36	73
02:05 PM	0	0	0	0	36	36	35	0	35	71
02:10 PM	0	0	0	1	46	47	42	1	43	90
02:15 PM	1	0	1	1	38	39	54	0	54	94
02:20 PM	2	1	3	0	35	35	33	0	33	71
02:25 PM	0	0	0	0	34	34	49	2	51	85
02:30 PM	0	1	1	0	40	40	41	0	41	82
02:35 PM	0	0	0	0	34	34	48	0	48	82
02:40 PM	1	0	1	0	40	40	39	1	40	81
02:45 PM	1	0	1	2	34	36	45	1	46	83
02:50 PM	0	0	0	0	34	34	34	1	35	69
02:55 PM	0	0	0	0	32	32	52	0	52	84
Total	5	3	8	5	438	443	506	8	514	965
03:00 PM	0	1	1	1	31	32	34	1	35	68
03:05 PM	1	1	2	0	32	32	62	3	65	99
03:10 PM	1	1	2	1	50	51	49	1	50	103
03:15 PM	2	0	2	1	51	52	41	0	41	95
03:20 PM	0	2	2	0	37	37	54	0	54	93
03:25 PM	1	2	3	2	56	58	56	0	56	117
03:30 PM	1	0	1	1	55	56	40	1	41	98
03:35 PM	1	0	1	2	33	35	57	1	58	94
03:40 PM	0	1	1	2	35	37	64	1	65	103
03:45 PM	1	1	2	0	42	42	48	0	48	92
03:50 PM	1	0	1	0	40	40	48	1	49	90
03:55 PM	1	2	3	0	43	43	54	2	56	102
Total	10	11	21	10	505	515	607	11	618	1154
04:00 PM	1	0	1	1	33	34	51	1	52	87
04:05 PM	1	0	1	0	46	46	56	1	57	104
04:10 PM	0	0	0	1	40	41	46	0	46	87
04:15 PM	1	1	2	2	51	53	65	0	65	120
04:20 PM	0	0	0	0	48	48	77	2	79	127
04:25 PM	0	0	0	0	50	50	65	1	66	116
04:30 PM	2	1	3	1	53	54	59	2	61	118
04:35 PM	2	0	2	0	54	54	67	2	69	125
04:40 PM	0	1	1	1	38	39	78	0	78	118
04:45 PM	1	1	2	0	41	41	66	1	67	110



TRAFFIC DATA COLLECTION

File Name : Weddington(NC 84 and Wheatberry Hill)

Site Code :

Start Date : 1/12/2023

Page No : 2

Groups Printed- Cars + - Trucks

Start Time	Wheatberry Hill Drive Southbound			NC 84 Westbound			NC 84 Eastbound			Int. Total
	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	
04:50 PM	2	0	2	1	58	59	49	3	52	113
04:55 PM	1	0	1	2	44	46	60	1	61	108
Total	11	4	15	9	556	565	739	14	753	1333
05:00 PM	2	1	3	0	36	36	65	0	65	104
05:05 PM	2	0	2	1	39	40	49	0	49	91
05:10 PM	2	0	2	0	48	48	47	0	47	97
05:15 PM	0	0	0	0	38	38	59	0	59	97
05:20 PM	1	0	1	0	36	36	44	2	46	83
05:25 PM	1	0	1	1	40	41	49	2	51	93
05:30 PM	3	0	3	0	41	41	52	2	54	98
05:35 PM	0	0	0	0	53	53	63	0	63	116
05:40 PM	0	0	0	0	44	44	62	3	65	109
05:45 PM	0	0	0	2	67	69	59	0	59	128
05:50 PM	2	0	2	0	42	42	48	3	51	95
05:55 PM	0	0	0	0	48	48	64	0	64	112
Total	13	1	14	4	532	536	661	12	673	1223
Grand Total	39	19	58	28	2031	2059	2513	45	2558	4675
Apprch %	67.2	32.8		1.4	98.6		98.2	1.8		
Total %	0.8	0.4	1.2	0.6	43.4	44	53.8	1	54.7	
Cars +	39	16	55	26	1983	2009	2458	45	2503	4567
% Cars +	100	84.2	94.8	92.9	97.6	97.6	97.8	100	97.8	97.7
Trucks	0	3	3	2	48	50	55	0	55	108
% Trucks	0	15.8	5.2	7.1	2.4	2.4	2.2	0	2.2	2.3



TRAFFIC DATA COLLECTION

File Name : Weddington(NC 84 and Wheatberry Hill)  
 Site Code :  
 Start Date : 1/12/2023  
 Page No : 3

Start Time	Wheatberry Hill Drive Southbound			NC 84 Westbound			NC 84 Eastbound			Int. Total
	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	
Peak Hour Analysis From 02:00 PM to 05:55 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:05 PM										
04:05 PM	1	0	1	0	46	46	56	1	57	104
04:10 PM	0	0	0	1	40	41	46	0	46	87
04:15 PM	1	1	2	2	51	53	65	0	65	120
04:20 PM	0	0	0	0	48	48	77	2	79	127
04:25 PM	0	0	0	0	50	50	65	1	66	116
04:30 PM	2	1	3	1	53	54	59	2	61	118
04:35 PM	2	0	2	0	54	54	67	2	69	125
04:40 PM	0	1	1	1	38	39	78	0	78	118
04:45 PM	1	1	2	0	41	41	66	1	67	110
04:50 PM	2	0	2	1	58	59	49	3	52	113
04:55 PM	1	0	1	2	44	46	60	1	61	108
05:00 PM	2	1	3	0	36	36	65	0	65	104
Total Volume	12	5	17	8	559	567	753	13	766	1350
% App. Total	70.6	29.4		1.4	98.6		98.3	1.7		
PHF	.500	.417	.472	.333	.803	.801	.804	.361	.808	.886





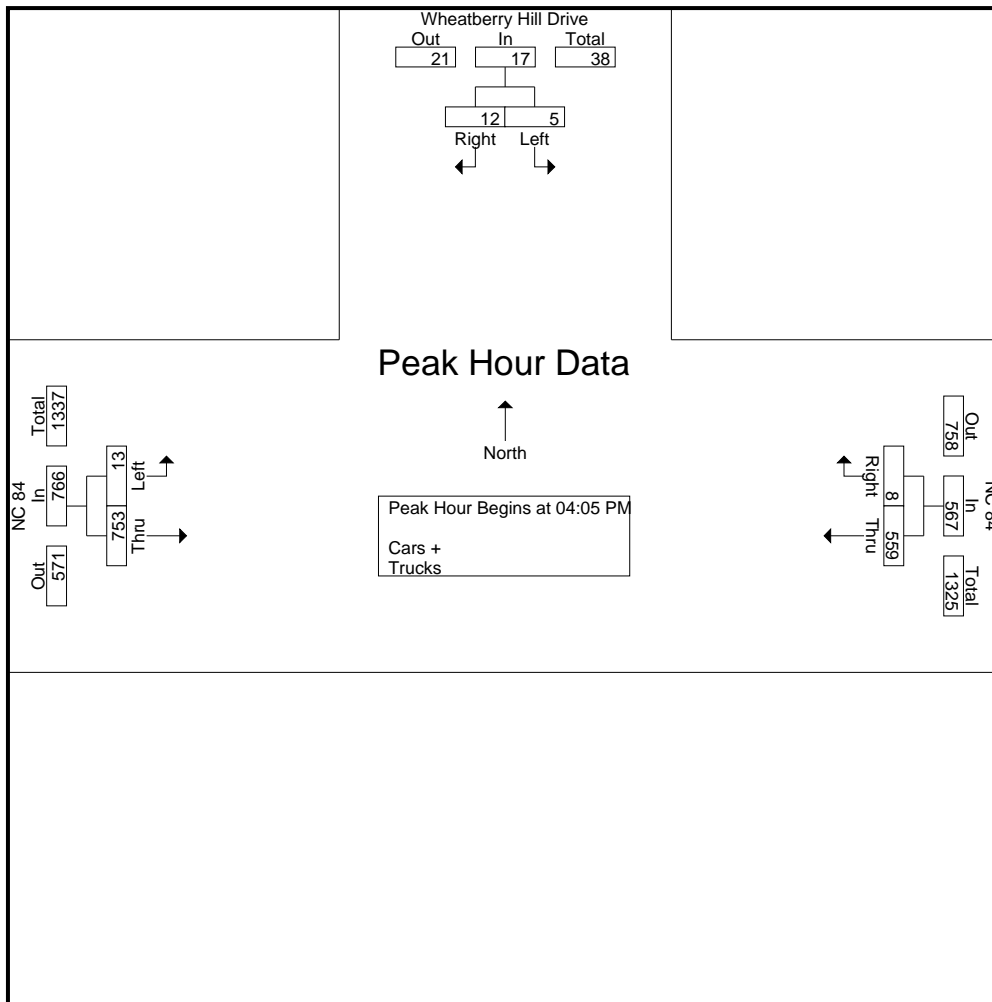
TRAFFIC DATA COLLECTION

File Name : Weddington(NC 84 and Wheatberry Hill)

Site Code :

Start Date : 1/12/2023

Page No : 4





TRAFFIC DATA COLLECTION

File Name : Weddington(NC 16 and Lenny Stadler)1157  
 Site Code :  
 Start Date : 1/12/2023  
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	NC 16 Southbound					NC 16 Northbound					Lenny Stadler Way Eastbound					Int. Total
	Right	Thru	UTrn	Peds	App. Total	Thru	Left	UTrn	Peds	App. Total	Right	Left	UTrn	Peds	App. Total	
07:00 AM	0	35	0	0	35	91	0	0	0	91	1	2	0	0	3	129
07:05 AM	2	29	0	0	31	116	0	0	0	116	3	4	0	0	7	154
07:10 AM	3	53	0	0	56	96	1	1	0	98	1	3	0	0	4	158
07:15 AM	1	56	0	0	57	115	7	0	0	122	7	1	0	0	8	187
07:20 AM	1	66	0	0	67	103	3	0	0	106	6	5	0	0	11	184
07:25 AM	3	53	0	0	56	130	5	0	0	135	1	3	0	0	4	195
07:30 AM	2	56	0	0	58	107	4	0	0	111	2	4	0	0	6	175
07:35 AM	3	84	0	0	87	122	1	0	0	123	4	5	0	0	9	219
07:40 AM	1	80	0	0	81	111	6	0	0	117	2	3	0	0	5	203
07:45 AM	3	69	0	0	72	94	1	0	0	95	5	2	0	0	7	174
07:50 AM	1	73	0	0	74	122	5	0	0	127	2	3	0	0	5	206
07:55 AM	8	82	0	0	90	84	13	2	0	99	1	1	0	0	2	191
Total	28	736	0	0	764	1291	46	3	0	1340	35	36	0	0	71	2175
08:00 AM	8	61	0	0	69	75	10	0	0	85	1	6	0	0	7	161
08:05 AM	11	86	0	0	97	84	12	0	0	96	4	2	0	0	6	199
08:10 AM	7	81	0	0	88	99	4	0	0	103	2	5	0	0	7	198
08:15 AM	1	81	0	0	82	102	7	0	0	109	2	3	0	0	5	196
08:20 AM	9	87	0	0	96	102	4	0	0	106	2	3	0	0	5	207
08:25 AM	5	88	0	0	93	101	4	0	0	105	1	1	0	0	2	200
08:30 AM	3	50	0	0	53	96	4	0	0	100	0	5	0	0	5	158
08:35 AM	13	97	0	0	110	92	6	0	0	98	0	1	0	0	1	209
08:40 AM	11	66	0	0	77	96	11	1	0	108	2	3	0	0	5	190
08:45 AM	14	57	0	0	71	104	14	0	0	118	2	4	0	0	6	195
08:50 AM	17	81	0	0	98	76	14	0	0	90	13	9	0	0	22	210
08:55 AM	16	72	0	0	88	63	23	0	0	86	23	6	0	0	29	203
Total	115	907	0	0	1022	1090	113	1	0	1204	52	48	0	0	100	2326
Grand Total	143	1643	0	0	1786	2381	159	4	0	2544	87	84	0	0	171	4501
Apprch %	8	92	0	0	93.6	93.6	6.2	0.2	0	50.9	49.1	0	0	0		
Total %	3.2	36.5	0	0	39.7	52.9	3.5	0.1	0	56.5	1.9	1.9	0	0	3.8	
Cars +	138	1600	0	0	1738	2362	157	4	0	2523	83	82	0	0	165	4426
% Cars +	96.5	97.4	0	0	97.3	99.2	98.7	100	0	99.2	95.4	97.6	0	0	96.5	98.3
Trucks	5	43	0	0	48	19	2	0	0	21	4	2	0	0	6	75
% Trucks	3.5	2.6	0	0	2.7	0.8	1.3	0	0	0.8	4.6	2.4	0	0	3.5	1.7



TRAFFIC DATA COLLECTION

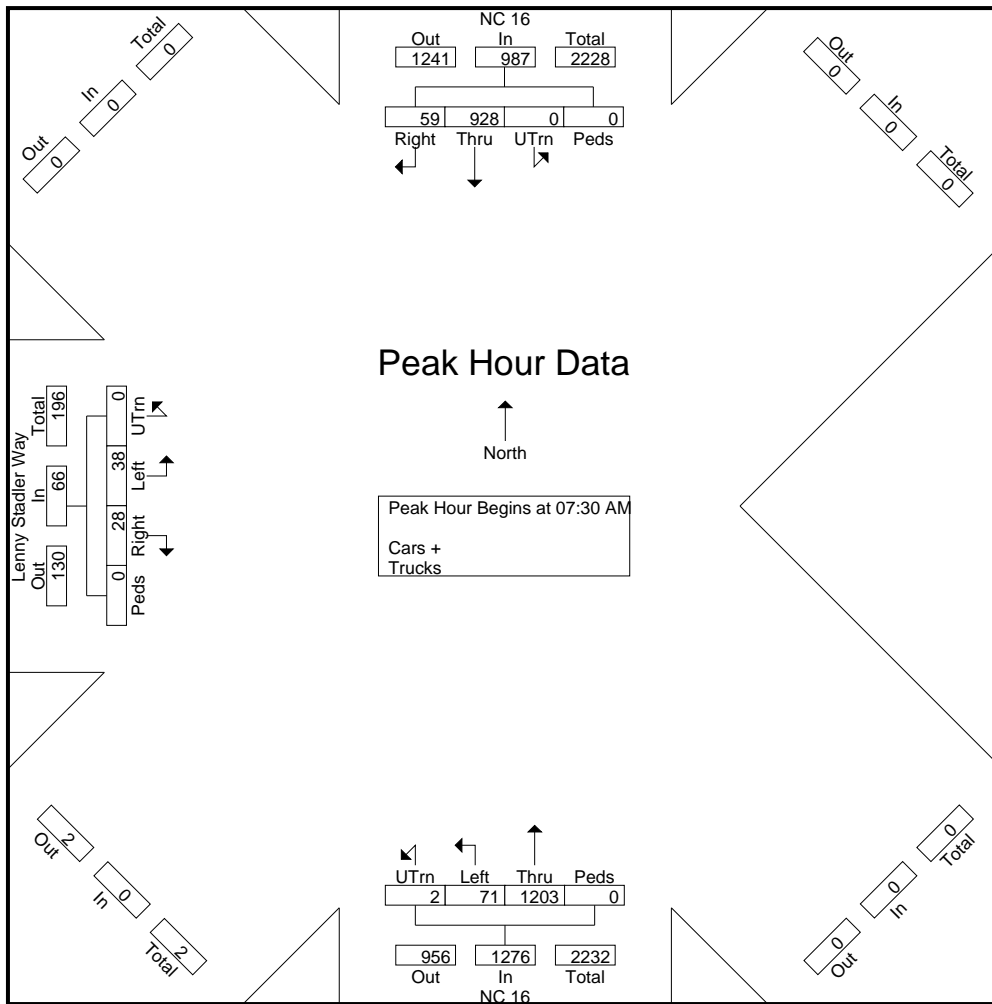
File Name : Weddington(NC 16 and Lenny Stadler)1157  
 Site Code :  
 Start Date : 1/12/2023  
 Page No : 2

Start Time	NC 16 Southbound					NC 16 Northbound					Lenny Stadler Way Eastbound					Int. Total
	Right	Thru	UTrn	Peds	App. Total	Thru	Left	UTrn	Peds	App. Total	Right	Left	UTrn	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:55 AM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 07:30 AM																
07:30 AM	2	56	0	0	58	107	4	0	0	111	2	4	0	0	6	175
07:35 AM	3	84	0	0	87	<b>122</b>	1	0	0	123	4	5	0	0	<b>9</b>	<b>219</b>
07:40 AM	1	80	0	0	81	111	6	0	0	117	2	3	0	0	5	203
07:45 AM	3	69	0	0	72	94	1	0	0	95	<b>5</b>	2	0	0	7	174
07:50 AM	1	73	0	0	74	122	5	0	0	<b>127</b>	2	3	0	0	5	206
07:55 AM	8	82	0	0	90	84	<b>13</b>	<b>2</b>	0	99	1	1	0	0	2	191
08:00 AM	8	61	0	0	69	75	10	0	0	85	1	<b>6</b>	0	0	7	161
08:05 AM	<b>11</b>	86	0	0	<b>97</b>	84	12	0	0	96	4	2	0	0	6	199
08:10 AM	7	81	0	0	88	99	4	0	0	103	2	5	0	0	7	198
08:15 AM	1	81	0	0	82	102	7	0	0	109	2	3	0	0	5	196
08:20 AM	9	87	0	0	96	102	4	0	0	106	2	3	0	0	5	207
08:25 AM	5	<b>88</b>	0	0	93	101	4	0	0	105	1	1	0	0	2	200
Total Volume	59	928	0	0	987	1203	71	2	0	1276	28	38	0	0	66	2329
% App. Total	6	94	0	0		94.3	5.6	0.2	0		42.4	57.6	0	0		
PHF	.447	.879	.000	.000	.848	.822	.455	.083	.000	.837	.467	.528	.000	.000	.611	.886



TRAFFIC DATA COLLECTION

File Name : Weddington(NC 16 and Lenny Stadler)1157  
 Site Code :  
 Start Date : 1/12/2023  
 Page No : 3





TRAFFIC DATA COLLECTION

File Name : Weddington(NC 16 and Lenny Stadler)  
 Site Code :  
 Start Date : 1/12/2023  
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	NC 16 Southbound				NC 16 Northbound				Lenny Stadler Way Eastbound				Int. Total
	Right	Thru	UTrn	App. Total	Thru	Left	UTrn	App. Total	Right	Left	UTrn	App. Total	
02:00 PM	3	75	0	78	72	5	1	78	1	4	0	5	161
02:05 PM	0	79	0	79	58	3	1	62	1	2	0	3	144
02:10 PM	3	57	0	60	84	7	0	91	1	4	0	5	156
02:15 PM	3	80	0	83	70	5	0	75	4	3	0	7	165
02:20 PM	3	66	0	69	81	4	0	85	1	2	0	3	157
02:25 PM	4	65	0	69	88	5	0	93	3	2	0	5	167
02:30 PM	3	81	0	84	70	7	0	77	1	7	0	8	169
02:35 PM	5	82	0	87	74	4	0	78	3	2	0	5	170
02:40 PM	6	80	0	86	85	9	0	94	2	4	0	6	186
02:45 PM	1	98	0	99	92	2	0	94	3	3	0	6	199
02:50 PM	3	81	0	84	66	4	0	70	5	3	0	8	162
02:55 PM	3	76	0	79	83	3	0	86	4	2	0	6	171
Total	37	920	0	957	923	58	2	983	29	38	0	67	2007
03:00 PM	1	46	0	47	84	6	0	90	3	2	0	5	142
03:05 PM	4	111	0	115	110	2	0	112	2	6	0	8	235
03:10 PM	4	101	0	105	84	3	0	87	1	3	0	4	196
03:15 PM	2	71	0	73	79	3	0	82	6	3	0	9	164
03:20 PM	6	80	0	86	85	5	0	90	1	0	0	1	177
03:25 PM	3	84	0	87	100	3	0	103	1	3	0	4	194
03:30 PM	2	122	0	124	97	2	0	99	2	3	0	5	228
03:35 PM	3	83	0	86	86	5	0	91	1	5	0	6	183
03:40 PM	4	100	0	104	108	4	0	112	0	5	0	5	221
03:45 PM	4	88	0	92	79	3	0	82	2	3	0	5	179
03:50 PM	4	99	0	103	96	1	1	98	2	2	0	4	205
03:55 PM	5	86	0	91	78	4	0	82	2	2	0	4	177
Total	42	1071	0	1113	1086	41	1	1128	23	37	0	60	2301
04:00 PM	1	105	0	106	80	1	0	81	1	1	0	2	189
04:05 PM	3	102	0	105	78	2	0	80	1	2	0	3	188
04:10 PM	5	77	0	82	83	0	0	83	2	4	0	6	171
04:15 PM	3	100	0	103	96	4	0	100	2	6	0	8	211
04:20 PM	3	95	0	98	115	2	0	117	1	4	0	5	220
04:25 PM	3	101	0	104	100	0	0	100	1	2	0	3	207
04:30 PM	0	101	0	101	79	4	1	84	1	3	0	4	189
04:35 PM	1	89	0	90	97	2	0	99	1	3	0	4	193
04:40 PM	5	86	0	91	85	0	0	85	2	5	0	7	183
04:45 PM	4	132	0	136	114	1	0	115	1	1	0	2	253



TRAFFIC DATA COLLECTION

File Name : Weddington(NC 16 and Lenny Stadler)

Site Code :

Start Date : 1/12/2023

Page No : 2

Groups Printed- Cars + - Trucks

Start Time	NC 16 Southbound				NC 16 Northbound				Lenny Stadler Way Eastbound				Int. Total
	Right	Thru	UTrn	App. Total	Thru	Left	UTrn	App. Total	Right	Left	UTrn	App. Total	
04:50 PM	2	111	0	113	79	2	0	81	4	4	0	8	202
04:55 PM	4	99	0	103	97	1	0	98	2	2	0	4	205
Total	34	1198	0	1232	1103	19	1	1123	19	37	0	56	2411
05:00 PM	1	103	0	104	100	1	0	101	0	3	0	3	208
05:05 PM	3	101	0	104	87	0	0	87	1	2	0	3	194
05:10 PM	3	97	0	100	103	1	0	104	1	6	0	7	211
05:15 PM	5	112	0	117	128	2	0	130	1	3	0	4	251
05:20 PM	1	101	0	102	105	0	0	105	1	3	0	4	211
05:25 PM	3	86	0	89	117	1	0	118	0	4	0	4	211
05:30 PM	2	93	0	95	104	2	0	106	0	6	0	6	207
05:35 PM	2	100	0	102	119	1	0	120	1	3	0	4	226
05:40 PM	4	84	0	88	113	1	0	114	2	3	0	5	207
05:45 PM	1	83	0	84	105	2	0	107	1	5	0	6	197
05:50 PM	0	99	0	99	120	5	1	126	0	5	0	5	230
05:55 PM	2	94	0	96	93	4	0	97	1	0	0	1	194
Total	27	1153	0	1180	1294	20	1	1315	9	43	0	52	2547
Grand Total	140	4342	0	4482	4406	138	5	4549	80	155	0	235	9266
Apprch %	3.1	96.9	0		96.9	3	0.1		34	66	0		
Total %	1.5	46.9	0	48.4	47.6	1.5	0.1	49.1	0.9	1.7	0	2.5	
Cars +	133	4292	0	4425	4307	120	5	4432	57	144	0	201	9058
% Cars +	95	98.8	0	98.7	97.8	87	100	97.4	71.2	92.9	0	85.5	97.8
Trucks	7	50	0	57	99	18	0	117	23	11	0	34	208
% Trucks	5	1.2	0	1.3	2.2	13	0	2.6	28.8	7.1	0	14.5	2.2



TRAFFIC DATA COLLECTION

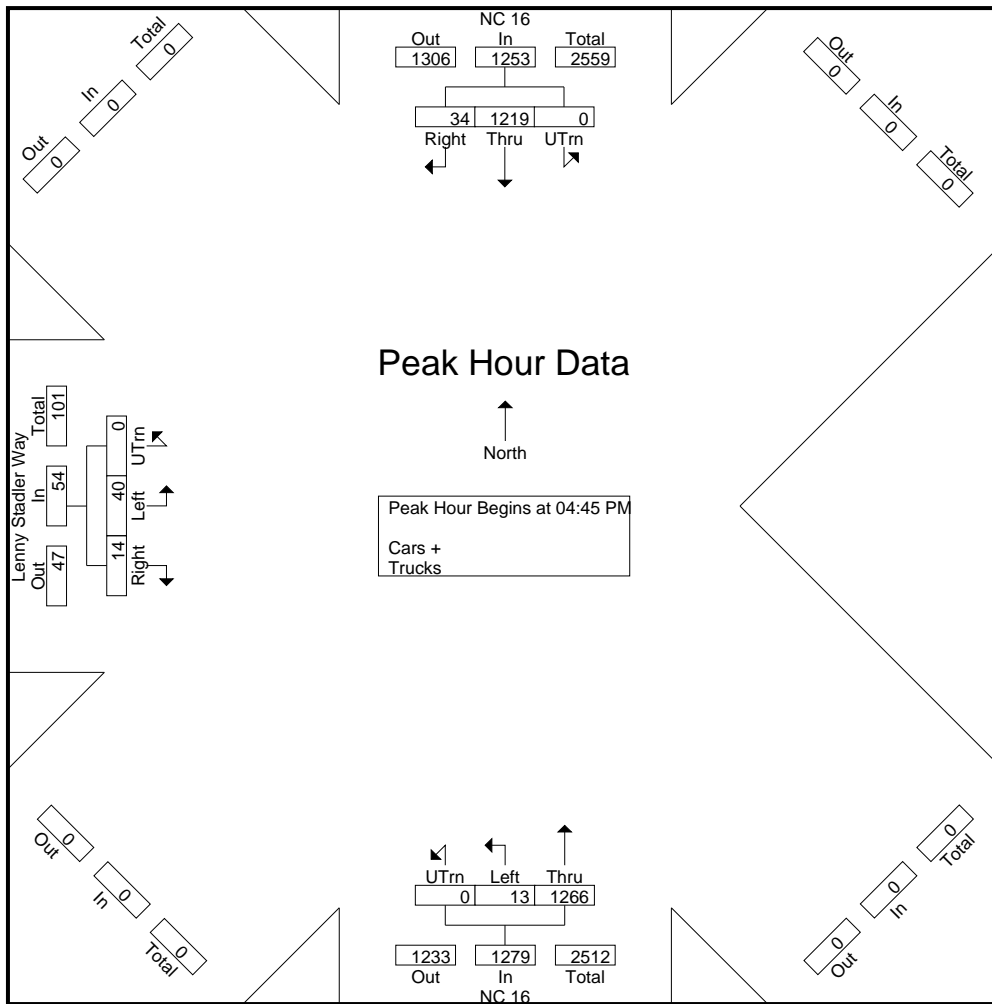
File Name : Weddington(NC 16 and Lenny Stadler)  
 Site Code :  
 Start Date : 1/12/2023  
 Page No : 3

Start Time	NC 16 Southbound				NC 16 Northbound				Lenny Stadler Way Eastbound				Int. Total
	Right	Thru	UTrn	App. Total	Thru	Left	UTrn	App. Total	Right	Left	UTrn	App. Total	
Peak Hour Analysis From 02:00 PM to 05:55 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	4	132	0	136	114	1	0	115	1	1	0	2	253
04:50 PM	2	111	0	113	79	2	0	81	4	4	0	8	202
04:55 PM	4	99	0	103	97	1	0	98	2	2	0	4	205
05:00 PM	1	103	0	104	100	1	0	101	0	3	0	3	208
05:05 PM	3	101	0	104	87	0	0	87	1	2	0	3	194
05:10 PM	3	97	0	100	103	1	0	104	1	6	0	7	211
05:15 PM	5	112	0	117	128	2	0	130	1	3	0	4	251
05:20 PM	1	101	0	102	105	0	0	105	1	3	0	4	211
05:25 PM	3	86	0	89	117	1	0	118	0	4	0	4	211
05:30 PM	2	93	0	95	104	2	0	106	0	6	0	6	207
05:35 PM	2	100	0	102	119	1	0	120	1	3	0	4	226
05:40 PM	4	84	0	88	113	1	0	114	2	3	0	5	207
Total Volume	34	1219	0	1253	1266	13	0	1279	14	40	0	54	2586
% App. Total	2.7	97.3	0		99	1	0		25.9	74.1	0		
PHF	.567	.770	.000	.768	.824	.542	.000	.820	.292	.556	.000	.563	.852



TRAFFIC DATA COLLECTION

File Name : Weddington(NC 16 and Lenny Stadler)  
 Site Code :  
 Start Date : 1/12/2023  
 Page No : 4







TRAFFIC DATA COLLECTION

File Name : Weddington(NC 16 and Marvin School)  
 Site Code :  
 Start Date : 1/12/2023  
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	NC 16 Southbound				NC 16 Northbound				Marvin School Road Eastbound				Int. Total
	Right	Thru	UTrn	App. Total	Thru	Left	UTrn	App. Total	Right	Left	UTrn	App. Total	
07:00 AM	15	21	0	36	88	22	0	110	5	23	0	28	174
07:05 AM	12	18	0	30	88	27	0	115	12	31	0	43	188
07:10 AM	20	31	0	51	75	34	0	109	19	32	0	51	211
07:15 AM	27	37	0	64	77	37	0	114	13	23	0	36	214
07:20 AM	23	47	0	70	87	25	0	112	27	29	0	56	238
07:25 AM	15	39	0	54	82	23	0	105	22	37	0	59	218
07:30 AM	31	37	0	68	85	21	0	106	18	38	0	56	230
07:35 AM	28	59	0	87	84	34	0	118	9	27	0	36	241
07:40 AM	27	54	0	81	83	34	0	117	8	22	0	30	228
07:45 AM	30	46	0	76	78	43	0	121	11	26	0	37	234
07:50 AM	24	49	0	73	79	29	0	108	15	23	0	38	219
07:55 AM	31	50	0	81	72	33	0	105	18	30	0	48	234
Total	283	488	0	771	978	362	0	1340	177	341	0	518	2629
08:00 AM	28	53	0	81	68	19	0	87	13	22	0	35	203
08:05 AM	39	48	0	87	77	11	0	88	16	27	0	43	218
08:10 AM	33	44	0	77	62	21	0	83	12	29	0	41	201
08:15 AM	32	51	0	83	76	23	0	99	6	33	0	39	221
08:20 AM	35	58	0	93	85	18	0	103	11	34	0	45	241
08:25 AM	41	51	0	92	79	14	0	93	7	11	0	18	203
08:30 AM	21	26	0	47	62	21	0	83	10	26	0	36	166
08:35 AM	35	46	0	81	70	22	0	92	9	32	0	41	214
08:40 AM	31	34	0	65	90	21	0	111	9	34	0	43	219
08:45 AM	27	36	0	63	64	16	0	80	11	33	0	44	187
08:50 AM	36	46	0	82	64	18	0	82	13	40	0	53	217
08:55 AM	35	55	0	90	55	18	1	74	8	27	0	35	199
Total	393	548	0	941	852	222	1	1075	125	348	0	473	2489
Grand Total	676	1036	0	1712	1830	584	1	2415	302	689	0	991	5118
Apprch %	39.5	60.5	0		75.8	24.2	0		30.5	69.5	0		
Total %	13.2	20.2	0	33.5	35.8	11.4	0	47.2	5.9	13.5	0	19.4	
Cars +	659	981	0	1640	1798	580	1	2379	292	678	0	970	4989
% Cars +	97.5	94.7	0	95.8	98.3	99.3	100	98.5	96.7	98.4	0	97.9	97.5
Trucks	17	55	0	72	32	4	0	36	10	11	0	21	129
% Trucks	2.5	5.3	0	4.2	1.7	0.7	0	1.5	3.3	1.6	0	2.1	2.5



TRAFFIC DATA COLLECTION

File Name : Weddington(NC 16 and Marvin School)  
 Site Code :  
 Start Date : 1/12/2023  
 Page No : 2

Start Time	NC 16 Southbound				NC 16 Northbound				Marvin School Road Eastbound				Int. Total
	Right	Thru	UTrn	App. Total	Thru	Left	UTrn	App. Total	Right	Left	UTrn	App. Total	
Peak Hour Analysis From 07:00 AM to 08:55 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:10 AM													
07:10 AM	20	31	0	51	75	34	0	109	19	32	0	51	211
07:15 AM	27	37	0	64	77	37	0	114	13	23	0	36	214
07:20 AM	23	47	0	70	<b>87</b>	25	0	112	<b>27</b>	29	0	56	238
07:25 AM	15	39	0	54	82	23	0	105	22	37	0	<b>59</b>	218
07:30 AM	31	37	0	68	85	21	0	106	18	<b>38</b>	0	56	230
07:35 AM	28	<b>59</b>	0	<b>87</b>	84	34	0	118	9	27	0	36	<b>241</b>
07:40 AM	27	54	0	81	83	34	0	117	8	22	0	30	228
07:45 AM	30	46	0	76	78	<b>43</b>	0	<b>121</b>	11	26	0	37	234
07:50 AM	24	49	0	73	79	29	0	108	15	23	0	38	219
07:55 AM	31	50	0	81	72	33	0	105	18	30	0	48	234
08:00 AM	28	53	0	81	68	19	0	87	13	22	0	35	203
08:05 AM	<b>39</b>	48	0	87	77	11	0	88	16	27	0	43	218
Total Volume	323	550	0	873	947	343	0	1290	189	336	0	525	2688
% App. Total	37	63	0		73.4	26.6	0		36	64	0		
PHF	.690	.777	.000	.836	.907	.665	.000	.888	.583	.737	.000	.742	.929



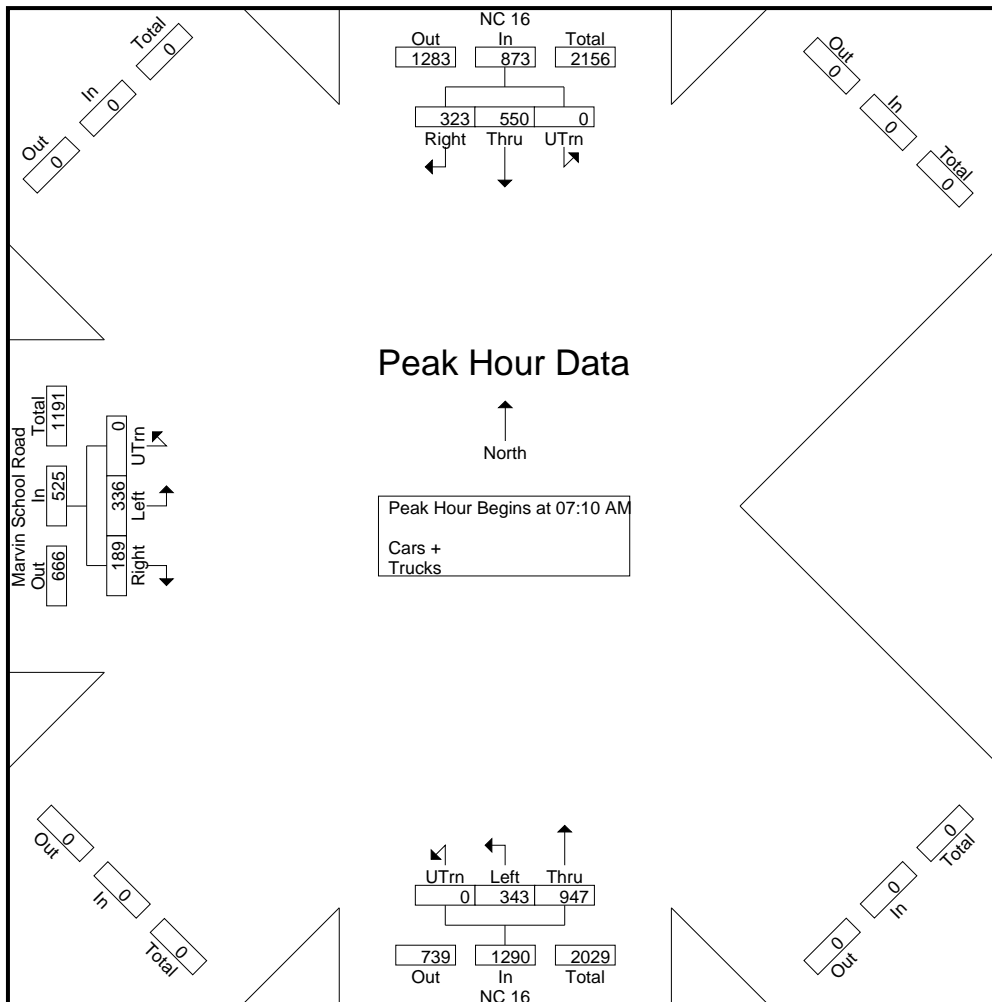
TRAFFIC DATA COLLECTION

File Name : Weddington(NC 16 and Marvin School)

Site Code :

Start Date : 1/12/2023

Page No : 3





TRAFFIC DATA COLLECTION

File Name : Weddington(NC 16 and Marvin School)1189.2  
 Site Code :  
 Start Date : 1/16/2023  
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	NC 16 Southbound					NC 16 Northbound					Marvin School Road Eastbound					Int. Total
	Right	Thru	UTrn	Peds	App. Total	Thru	Left	UTrn	Peds	App. Total	Right	Left	UTrn	Peds	App. Total	
02:00 PM	32	68	0	0	100	44	10	0	0	54	23	22	0	0	45	199
02:05 PM	19	42	0	0	61	40	12	0	0	52	25	36	0	0	61	174
02:10 PM	14	64	0	0	78	59	21	1	0	81	28	32	0	0	60	219
02:15 PM	18	47	0	0	65	33	10	0	0	43	24	42	0	0	66	174
02:20 PM	19	63	0	0	82	62	9	0	0	71	13	23	0	0	36	189
02:25 PM	17	43	0	0	60	54	4	0	0	58	31	40	0	0	71	189
02:30 PM	18	70	0	0	88	51	14	0	0	65	15	23	0	0	38	191
02:35 PM	12	57	0	0	69	48	11	0	0	59	19	41	0	0	60	188
02:40 PM	34	73	1	0	108	65	15	0	0	80	17	23	0	0	40	228
02:45 PM	27	57	0	0	84	62	18	0	0	80	28	32	0	0	60	224
02:50 PM	28	69	0	0	97	52	25	0	0	77	18	22	0	0	40	214
02:55 PM	22	50	0	0	72	61	21	0	0	82	26	25	0	0	51	205
Total	260	703	1	0	964	631	170	1	0	802	267	361	0	0	628	2394
03:00 PM	18	41	0	0	59	63	11	0	0	74	29	27	0	0	56	189
03:05 PM	25	72	0	0	97	68	18	0	0	86	16	44	0	0	60	243
03:10 PM	23	62	0	0	85	56	27	0	0	83	17	27	0	0	44	212
03:15 PM	28	62	0	0	90	43	22	0	0	65	23	39	0	0	62	217
03:20 PM	16	65	0	0	81	56	21	0	0	77	23	31	0	0	54	212
03:25 PM	25	64	0	0	89	66	8	0	0	74	25	36	0	0	61	224
03:30 PM	37	62	1	0	100	61	16	0	0	77	18	38	0	0	56	233
03:35 PM	29	61	0	0	90	65	12	0	0	77	32	33	0	0	65	232
03:40 PM	29	65	0	0	94	50	15	0	0	65	22	49	0	0	71	230
03:45 PM	22	67	0	0	89	48	15	0	0	63	29	33	0	0	62	214
03:50 PM	40	64	0	0	104	52	22	0	0	74	22	45	0	0	67	245
03:55 PM	22	68	0	0	90	51	13	0	0	64	25	31	0	0	56	210
Total	314	753	1	0	1068	679	200	0	0	879	281	433	0	0	714	2661
04:00 PM	28	69	0	0	97	47	14	0	0	61	26	34	0	0	60	218
04:05 PM	34	68	0	0	102	37	10	0	0	47	25	40	0	0	65	214
04:10 PM	26	61	0	0	87	52	8	0	0	60	24	33	0	0	57	204
04:15 PM	24	66	0	0	90	53	17	0	0	70	22	44	0	0	66	226
04:20 PM	32	64	0	0	96	62	9	0	0	71	24	54	0	0	78	245
04:25 PM	25	73	0	0	98	61	15	0	0	76	21	39	0	0	60	234
04:30 PM	47	66	0	0	113	44	15	0	0	59	25	40	0	0	65	237
04:35 PM	22	60	0	0	82	53	11	0	0	64	32	46	0	0	78	224
04:40 PM	38	59	1	0	98	40	11	0	0	51	24	45	0	0	69	218
04:45 PM	46	65	1	0	112	63	15	0	0	78	24	49	0	0	73	263



TRAFFIC DATA COLLECTION

File Name : Weddington(NC 16 and Marvin School)1189.2

Site Code :

Start Date : 1/16/2023

Page No : 2

Groups Printed- Cars + - Trucks

Start Time	NC 16 Southbound					NC 16 Northbound					Marvin School Road Eastbound					Int. Total
	Right	Thru	UTrn	Peds	App. Total	Thru	Left	UTrn	Peds	App. Total	Right	Left	UTrn	Peds	App. Total	
04:50 PM	46	53	0	0	99	41	9	0	0	50	23	40	0	0	63	212
04:55 PM	48	59	1	0	108	56	19	0	1	76	15	39	0	0	54	238
Total	416	763	3	0	1182	609	153	0	1	763	285	503	0	0	788	2733
05:00 PM	37	62	0	0	99	52	15	0	0	67	25	48	0	0	73	239
05:05 PM	44	58	0	0	102	47	12	0	0	59	30	39	0	0	69	230
05:10 PM	35	66	0	0	101	50	20	0	0	70	25	53	0	0	78	249
05:15 PM	49	54	0	0	103	71	11	0	0	82	24	57	0	0	81	266
05:20 PM	39	56	0	0	95	57	18	0	0	75	16	48	0	0	64	234
05:25 PM	34	67	0	0	101	68	15	0	0	83	22	50	0	0	72	256
05:30 PM	43	60	0	0	103	59	9	0	0	68	14	46	0	0	60	231
05:35 PM	34	60	0	0	94	68	17	0	0	85	20	49	0	0	69	248
05:40 PM	38	45	1	0	84	53	12	1	0	66	24	55	0	0	79	229
05:45 PM	26	53	0	0	79	51	15	0	0	66	28	61	0	0	89	234
05:50 PM	45	42	0	0	87	69	9	0	0	78	32	53	0	0	85	250
05:55 PM	37	56	0	0	93	48	16	0	0	64	28	49	0	0	77	234
Total	461	679	1	0	1141	693	169	1	0	863	288	608	0	0	896	2900
Grand Total	1451	2898	6	0	4355	2612	692	2	1	3307	1121	1905	0	0	3026	10688
Apprch %	33.3	66.5	0.1	0		79	20.9	0.1	0		37	63	0	0		
Total %	13.6	27.1	0.1	0	40.7	24.4	6.5	0	0	30.9	10.5	17.8	0	0	28.3	
Cars +	1440	2854	6	0	4300	2557	689	2	1	3249	1109	1892	0	0	3001	10550
% Cars +	99.2	98.5	100	0	98.7	97.9	99.6	100	100	98.2	98.9	99.3	0	0	99.2	98.7
Trucks	11	44	0	0	55	55	3	0	0	58	12	13	0	0	25	138
% Trucks	0.8	1.5	0	0	1.3	2.1	0.4	0	0	1.8	1.1	0.7	0	0	0.8	1.3



TRAFFIC DATA COLLECTION

File Name : Weddington(NC 16 and Marvin School)1189.2  
 Site Code :  
 Start Date : 1/16/2023  
 Page No : 3

Start Time	NC 16 Southbound					NC 16 Northbound					Marvin School Road Eastbound					Int. Total
	Right	Thru	UTrn	Peds	App. Total	Thru	Left	UTrn	Peds	App. Total	Right	Left	UTrn	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 05:55 PM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 04:55 PM																
04:55 PM	48	59	1	0	108	56	19	0	1	76	15	39	0	0	54	238
05:00 PM	37	62	0	0	99	52	15	0	0	67	25	48	0	0	73	239
05:05 PM	44	58	0	0	102	47	12	0	0	59	30	39	0	0	69	230
05:10 PM	35	66	0	0	101	50	20	0	0	70	25	53	0	0	78	249
05:15 PM	49	54	0	0	103	71	11	0	0	82	24	57	0	0	81	266
05:20 PM	39	56	0	0	95	57	18	0	0	75	16	48	0	0	64	234
05:25 PM	34	67	0	0	101	68	15	0	0	83	22	50	0	0	72	256
05:30 PM	43	60	0	0	103	59	9	0	0	68	14	46	0	0	60	231
05:35 PM	34	60	0	0	94	68	17	0	0	85	20	49	0	0	69	248
05:40 PM	38	45	1	0	84	53	12	1	0	66	24	55	0	0	79	229
05:45 PM	26	53	0	0	79	51	15	0	0	66	28	61	0	0	89	234
05:50 PM	45	42	0	0	87	69	9	0	0	78	32	53	0	0	85	250
Total Volume	472	682	2	0	1156	701	172	1	1	875	275	598	0	0	873	2904
% App. Total	40.8	59	0.2	0		80.1	19.7	0.1	0.1		31.5	68.5	0	0		
PHF	.803	.848	.167	.000	.892	.823	.717	.083	.083	.858	.716	.817	.000	.000	.817	.910



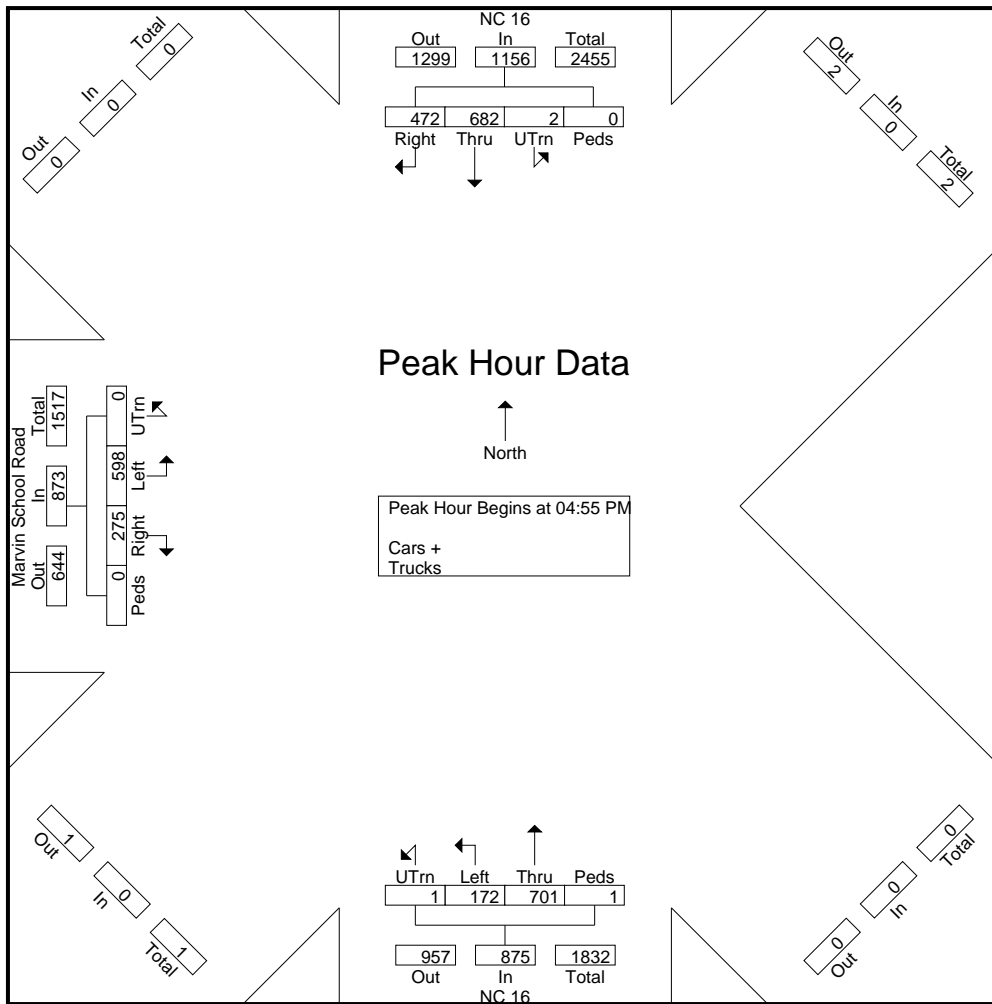
TRAFFIC DATA COLLECTION

File Name : Weddington(NC 16 and Marvin School)1189.2

Site Code :

Start Date : 1/16/2023

Page No : 4





TRAFFIC DATA COLLECTION

File Name : Weddington(NC 16 and Weddington Rd)2150  
 Site Code :  
 Start Date : 1/12/2023  
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	NC 16 Southbound					NC 84 Westbound					NC 16 Northbound					Church Access Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
07:00 AM	0	22	11	0	33	48	0	13	0	61	10	74	0	1	85	0	0	0	0	0	179
07:05 AM	0	26	12	0	38	42	0	9	0	51	20	104	0	0	124	0	0	0	0	0	213
07:10 AM	0	35	15	0	50	44	1	20	0	65	17	89	0	0	106	0	0	2	0	2	223
07:15 AM	0	37	24	0	61	56	0	17	0	73	20	95	0	0	115	0	1	0	0	1	250
07:20 AM	0	39	18	0	57	54	0	36	0	90	18	88	0	0	106	0	0	0	0	0	253
07:25 AM	0	35	19	0	54	39	0	24	0	63	21	98	0	0	119	0	0	0	0	0	236
07:30 AM	0	47	23	0	70	29	0	25	0	54	31	73	0	1	105	0	0	2	0	2	231
07:35 AM	0	49	23	0	72	23	0	27	0	50	27	116	0	0	143	0	0	0	0	0	265
07:40 AM	0	54	19	0	73	26	0	29	0	55	24	83	0	1	108	0	0	0	0	0	236
07:45 AM	1	45	17	0	63	24	0	26	0	50	23	86	0	0	109	0	0	0	0	0	222
07:50 AM	0	39	20	0	59	25	0	36	0	61	30	72	0	2	104	0	0	0	0	0	224
07:55 AM	0	53	17	0	70	21	0	37	0	58	14	78	1	0	93	0	0	0	0	0	221
Total	1	481	218	0	700	431	1	299	0	731	255	1056	1	5	1317	0	1	4	0	5	2753
08:00 AM	0	34	22	0	56	22	0	34	2	58	11	49	0	4	64	0	4	3	0	7	185
08:05 AM	0	55	18	0	73	20	1	23	0	44	14	85	0	4	103	0	2	11	0	13	233
08:10 AM	1	53	18	1	73	21	2	31	1	55	18	84	0	4	106	0	2	6	0	8	242
08:15 AM	0	60	13	0	73	29	0	25	0	54	16	100	0	2	118	0	2	3	0	5	250
08:20 AM	0	54	22	0	76	29	3	34	0	66	12	94	1	0	107	0	1	1	0	2	251
08:25 AM	0	70	25	0	95	48	5	32	0	85	17	82	0	0	99	0	1	1	0	2	281
08:30 AM	0	28	10	0	38	37	3	17	0	57	7	81	0	0	88	0	1	1	0	2	185
08:35 AM	0	69	32	0	101	31	1	36	0	68	25	73	0	0	98	0	0	0	0	0	267
08:40 AM	0	45	29	0	74	40	0	29	0	69	20	93	0	0	113	0	0	0	0	0	256
08:45 AM	0	46	23	0	69	40	0	26	0	66	17	86	0	0	103	0	4	3	0	7	245
08:50 AM	0	48	33	0	81	40	0	45	0	85	28	57	0	1	86	2	4	7	0	13	265
08:55 AM	0	57	17	0	74	36	0	33	0	69	14	77	0	0	91	0	4	9	0	13	247
Total	1	619	262	1	883	393	15	365	3	776	199	961	1	15	1176	2	25	45	0	72	2907
Grand Total	2	1100	480	1	1583	824	16	664	3	1507	454	2017	2	20	2493	2	26	49	0	77	5660
Apprch %	0.1	69.5	30.3	0.1		54.7	1.1	44.1	0.2		18.2	80.9	0.1	0.8		2.6	33.8	63.6	0		
Total %	0	19.4	8.5	0	28	14.6	0.3	11.7	0.1	26.6	8	35.6	0	0.4	44	0	0.5	0.9	0	1.4	
Cars +	2	1050	465	1	1518	812	16	651	3	1482	443	2002	2	20	2467	2	26	49	0	77	5544
% Cars +	100	95.5	96.9	100	95.9	98.5	100	98	100	98.3	97.6	99.3	100	100	99	100	100	100	0	100	98
Trucks	0	50	15	0	65	12	0	13	0	25	11	15	0	0	26	0	0	0	0	0	116
% Trucks	0	4.5	3.1	0	4.1	1.5	0	2	0	1.7	2.4	0.7	0	0	1	0	0	0	0	0	2





TRAFFIC DATA COLLECTION

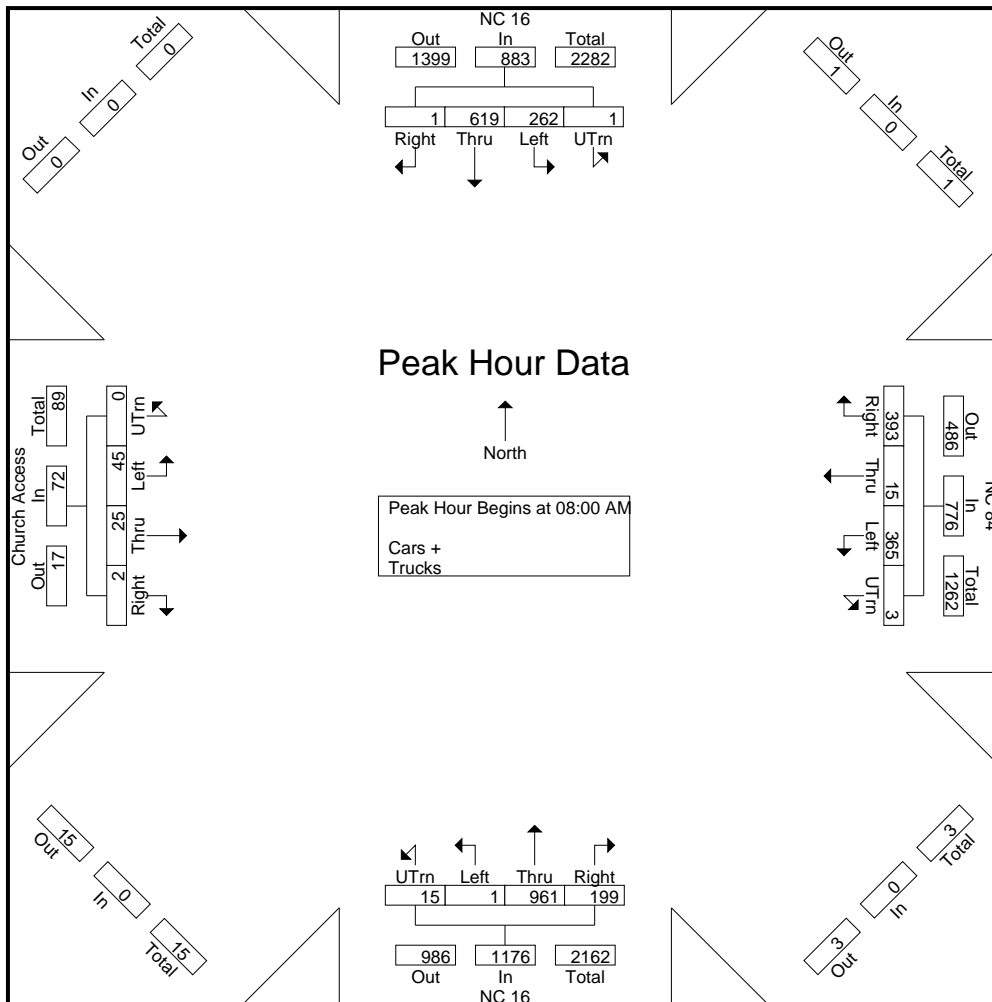
File Name : Weddington(NC 16 and Weddington Rd)2150  
 Site Code :  
 Start Date : 1/12/2023  
 Page No : 2

Start Time	NC 16 Southbound					NC 84 Westbound					NC 16 Northbound					Church Access Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
Peak Hour Analysis From 07:00 AM to 08:55 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	34	22	0	56	22	0	34	2	58	11	49	0	4	64	0	4	3	0	7	185
08:05 AM	0	55	18	0	73	20	1	23	0	44	14	85	0	4	103	0	2	11	0	13	233
08:10 AM	1	53	18	1	73	21	2	31	1	55	18	84	0	4	106	0	2	6	0	8	242
08:15 AM	0	60	13	0	73	29	0	25	0	54	16	100	0	2	118	0	2	3	0	5	250
08:20 AM	0	54	22	0	76	29	3	34	0	66	12	94	1	0	107	0	1	1	0	2	251
08:25 AM	0	70	25	0	95	48	5	32	0	85	17	82	0	0	99	0	1	1	0	2	281
08:30 AM	0	28	10	0	38	37	3	17	0	57	7	81	0	0	88	0	1	1	0	2	185
08:35 AM	0	69	32	0	101	31	1	36	0	68	25	73	0	0	98	0	0	0	0	0	267
08:40 AM	0	45	29	0	74	40	0	29	0	69	20	93	0	0	113	0	0	0	0	0	256
08:45 AM	0	46	23	0	69	40	0	26	0	66	17	86	0	0	103	0	4	3	0	7	245
08:50 AM	0	48	33	0	81	40	0	45	0	85	28	57	0	1	86	2	4	7	0	13	265
08:55 AM	0	57	17	0	74	36	0	33	0	69	14	77	0	0	91	0	4	9	0	13	247
Total Volume	1	619	262	1	883	393	15	365	3	776	199	961	1	15	1176	2	25	45	0	72	2907
% App. Total	0.1	70.1	29.7	0.1		50.6	1.9	47	0.4		16.9	81.7	0.1	1.3		2.8	34.7	62.5	0		
PHF	.083	.737	.662	.083	.729	.682	.250	.676	.125	.761	.592	.801	.083	.313	.831	.083	.521	.341	.000	.462	.862



TRAFFIC DATA COLLECTION

File Name : Weddington(NC 16 and Weddington Rd)2150  
 Site Code :  
 Start Date : 1/12/2023  
 Page No : 3





TRAFFIC DATA COLLECTION

File Name : Weddington(NC 16 and Weddington Rd)2150  
 Site Code :  
 Start Date : 1/12/2023  
 Page No : 1

Groups Printed- Cars + - Trucks

Start Time	NC 16 Southbound					NC 84 Westbound					NC 16 Northbound					Church Access Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
02:00 PM	0	47	18	1	66	25	0	32	0	57	22	48	0	0	70	0	1	2	0	3	196
02:05 PM	0	66	27	0	93	23	0	10	0	33	7	61	0	0	68	0	0	0	0	0	194
02:10 PM	0	34	27	0	61	35	0	28	0	63	26	50	0	0	76	0	0	0	0	0	200
02:15 PM	0	74	44	0	118	29	0	9	0	38	16	70	1	0	87	0	0	1	0	1	244
02:20 PM	0	46	16	0	62	27	3	30	0	60	17	45	0	0	62	0	0	0	0	0	184
02:25 PM	1	50	36	0	87	18	0	16	0	34	19	78	0	0	97	0	1	0	0	1	219
02:30 PM	3	71	19	0	93	29	1	0	0	30	23	51	0	0	74	0	0	0	0	0	197
02:35 PM	0	63	42	0	105	31	1	23	0	55	21	67	1	0	89	1	3	0	0	4	253
02:40 PM	0	68	24	0	92	21	0	28	0	49	16	66	0	0	82	0	0	2	0	2	225
02:45 PM	0	77	28	0	105	25	1	22	0	48	26	73	2	0	101	0	0	2	0	2	256
02:50 PM	0	54	22	0	76	21	1	28	0	50	17	44	0	0	61	0	6	0	0	6	193
02:55 PM	0	73	31	0	104	31	0	4	0	35	21	76	0	0	97	0	5	7	0	12	248
Total	4	723	334	1	1062	315	7	230	0	552	231	729	4	0	964	1	16	14	0	31	2609
03:00 PM	0	47	26	0	73	22	0	12	0	34	17	44	0	0	61	0	1	1	0	2	170
03:05 PM	0	95	41	0	136	14	0	20	0	34	40	81	0	0	121	0	0	2	0	2	293
03:10 PM	0	75	39	0	114	32	0	29	0	61	31	46	0	0	77	0	1	1	0	2	254
03:15 PM	0	53	25	0	78	35	1	24	0	60	26	54	0	0	80	0	0	0	0	0	218
03:20 PM	0	53	32	0	85	29	0	31	0	60	20	66	0	0	86	0	2	1	0	3	234
03:25 PM	0	69	48	0	117	34	0	17	0	51	22	59	0	0	81	0	1	0	0	1	250
03:30 PM	0	89	27	0	116	44	1	34	0	79	32	65	0	0	97	0	0	0	0	0	292
03:35 PM	0	57	40	0	97	21	0	29	0	50	26	62	0	0	88	0	2	0	0	2	237
03:40 PM	0	82	44	0	126	25	1	21	0	47	39	59	0	0	98	0	3	1	0	4	275
03:45 PM	0	71	25	0	96	27	0	11	0	38	23	69	0	0	92	0	0	0	0	0	226
03:50 PM	0	63	30	0	93	35	0	15	0	50	22	90	0	0	112	0	0	0	0	0	255
03:55 PM	0	87	39	0	126	23	0	27	0	50	24	64	0	0	88	0	0	0	0	0	264
Total	0	841	416	0	1257	341	3	270	0	614	322	759	0	0	1081	0	10	6	0	16	2968
04:00 PM	0	98	37	0	135	26	0	15	0	41	20	58	0	0	78	0	1	0	0	1	255
04:05 PM	0	65	43	0	108	35	0	35	0	70	30	30	0	0	60	0	4	2	0	6	244
04:10 PM	0	66	38	0	104	22	1	20	0	43	17	70	0	0	87	0	0	1	0	1	235
04:15 PM	0	68	47	0	115	34	0	33	0	67	34	52	0	0	86	0	0	1	0	1	269
04:20 PM	0	70	44	0	114	37	1	31	0	69	42	77	0	0	119	0	0	1	0	1	303
04:25 PM	0	81	44	0	125	25	0	22	0	47	28	71	0	0	99	0	0	0	0	0	271
04:30 PM	0	73	46	0	119	34	0	28	0	62	19	72	0	0	91	0	2	0	0	2	274
04:35 PM	0	62	48	0	110	30	0	23	0	53	31	62	0	0	93	0	0	0	0	0	256
04:40 PM	0	78	44	0	122	22	0	21	0	43	33	65	0	0	98	1	0	1	0	2	265
04:45 PM	0	90	33	0	123	32	0	42	0	74	40	69	0	2	111	0	0	1	0	1	309



TRAFFIC DATA COLLECTION

File Name : Weddington(NC 16 and Weddington Rd)2150

Site Code :

Start Date : 1/12/2023

Page No : 2

Groups Printed- Cars + - Trucks

Start Time	NC 16 Southbound					NC 84 Westbound					NC 16 Northbound					Church Access Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
04:50 PM	0	76	38	0	114	32	0	35	0	67	30	55	0	0	85	0	2	0	0	2	268
04:55 PM	0	78	39	0	117	25	0	24	0	49	27	62	0	0	89	0	2	1	0	3	258
Total	0	905	501	0	1406	354	2	329	0	685	351	743	0	2	1096	1	11	8	0	20	3207
05:00 PM	0	73	36	0	109	29	0	31	0	60	29	84	0	0	113	0	3	0	0	3	285
05:05 PM	0	73	38	0	111	28	0	30	0	58	18	68	0	0	86	0	0	0	0	0	255
05:10 PM	0	76	32	0	108	29	0	28	0	57	32	77	0	0	109	0	0	0	0	0	274
05:15 PM	0	79	41	0	120	29	1	36	0	66	38	89	0	0	127	0	0	0	0	0	313
05:20 PM	1	73	23	0	97	27	0	27	0	54	32	116	0	0	148	0	0	1	0	1	300
05:25 PM	0	78	33	0	111	28	0	27	0	55	41	76	0	0	117	0	0	0	0	0	283
05:30 PM	0	67	44	0	111	38	1	23	0	62	23	66	0	0	89	0	0	0	0	0	262
05:35 PM	0	69	36	1	106	32	0	32	0	64	35	81	0	0	116	0	1	0	0	1	287
05:40 PM	1	59	41	0	101	35	0	26	0	61	36	90	0	0	126	0	0	1	0	1	289
05:45 PM	0	54	29	0	83	42	0	34	0	76	33	73	0	0	106	0	0	1	0	1	266
05:50 PM	1	78	26	0	105	20	1	22	0	43	29	107	1	3	140	0	0	1	0	1	289
05:55 PM	0	70	39	0	109	40	1	27	0	68	32	58	0	2	92	0	0	0	0	0	269
Total	3	849	418	1	1271	377	4	343	0	724	378	985	1	5	1369	0	4	4	0	8	3372
Grand Total	7	3318	1669	2	4996	1387	16	1172	0	2575	1282	3216	5	7	4510	2	41	32	0	75	12156
Apprch %	0.1	66.4	33.4	0		53.9	0.6	45.5	0		28.4	71.3	0.1	0.2		2.7	54.7	42.7	0		
Total %	0.1	27.3	13.7	0	41.1	11.4	0.1	9.6	0	21.2	10.5	26.5	0	0.1	37.1	0	0.3	0.3	0	0.6	
Cars +	7	3291	1653	1	4952	1357	15	1159	0	2531	1249	3159	5	7	4420	2	40	32	0	74	11977
% Cars +	100	99.2	99	50	99.1	97.8	93.8	98.9	0	98.3	97.4	98.2	100	100	98	100	97.6	100	0	98.7	98.5
Trucks	0	27	16	1	44	30	1	13	0	44	33	57	0	0	90	0	1	0	0	1	179
% Trucks	0	0.8	1	50	0.9	2.2	6.2	1.1	0	1.7	2.6	1.8	0	0	2	0	2.4	0	0	1.3	1.5



TRAFFIC DATA COLLECTION

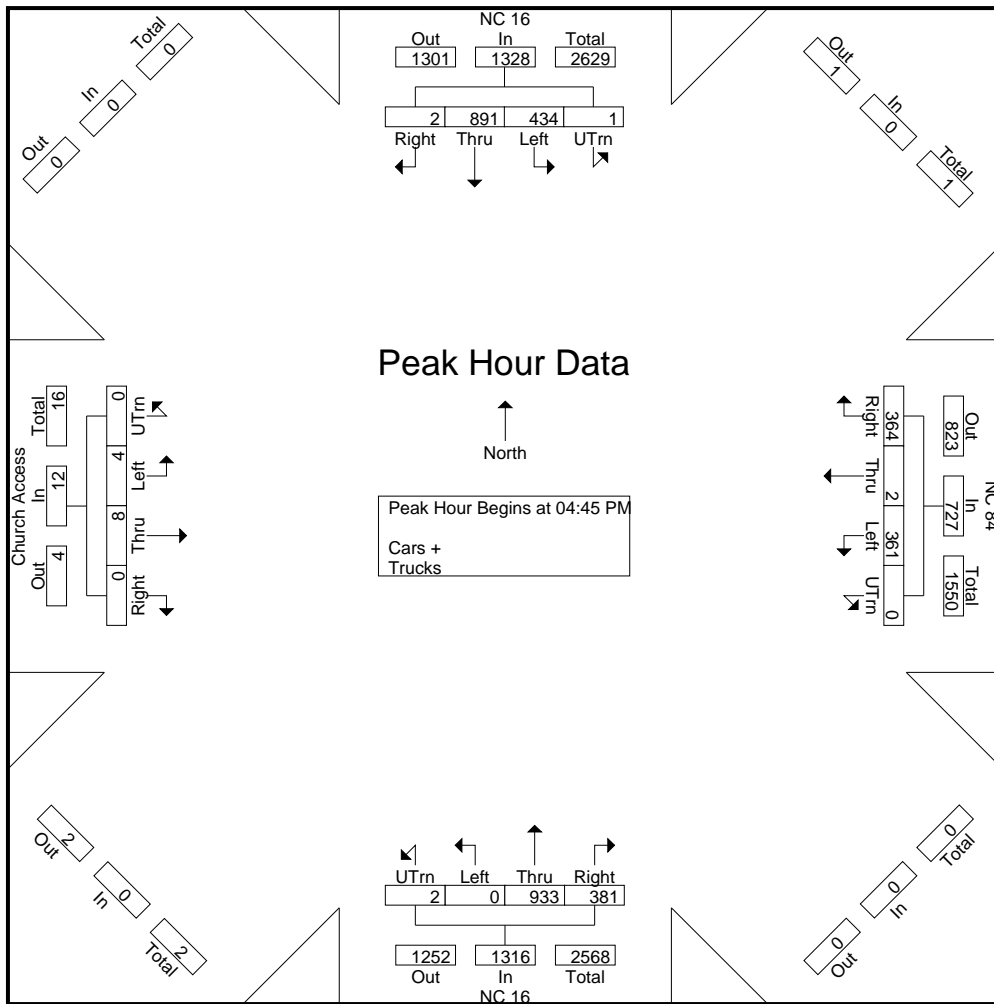
File Name : Weddington(NC 16 and Weddington Rd)2150  
 Site Code :  
 Start Date : 1/12/2023  
 Page No : 3

Start Time	NC 16 Southbound					NC 84 Westbound					NC 16 Northbound					Church Access Eastbound					Int. Total
	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	Right	Thru	Left	UTrn	App. Total	
Peak Hour Analysis From 02:00 PM to 05:55 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	<b>90</b>	33	0	<b>123</b>	32	0	<b>42</b>	0	<b>74</b>	40	69	0	<b>2</b>	111	0	0	<b>1</b>	0	1	309
04:50 PM	0	76	38	0	114	32	0	35	0	67	30	55	0	0	85	0	2	0	0	2	268
04:55 PM	0	78	39	0	117	25	0	24	0	49	27	62	0	0	89	0	2	1	0	<b>3</b>	258
05:00 PM	0	73	36	0	109	29	0	31	0	60	29	84	0	0	113	0	<b>3</b>	0	0	3	285
05:05 PM	0	73	38	0	111	28	0	30	0	58	18	68	0	0	86	0	0	0	0	0	255
05:10 PM	0	76	32	0	108	29	0	28	0	57	32	77	0	0	109	0	0	0	0	0	274
05:15 PM	0	79	41	0	120	29	<b>1</b>	36	0	66	38	89	0	0	127	0	0	0	0	0	<b>313</b>
05:20 PM	<b>1</b>	73	23	0	97	27	0	27	0	54	32	<b>116</b>	0	0	<b>148</b>	0	0	1	0	1	300
05:25 PM	0	78	33	0	111	28	0	27	0	55	<b>41</b>	76	0	0	117	0	0	0	0	0	283
05:30 PM	0	67	<b>44</b>	0	111	<b>38</b>	1	23	0	62	23	66	0	0	89	0	0	0	0	0	262
05:35 PM	0	69	36	<b>1</b>	106	32	0	32	0	64	35	81	0	0	116	0	1	0	0	1	287
05:40 PM	<b>1</b>	59	41	0	101	35	0	26	0	61	36	90	0	0	126	0	0	1	0	1	289
Total Volume	2	891	434	1	1328	364	2	361	0	727	381	933	0	2	1316	0	8	4	0	12	3383
% App. Total	0.2	67.1	32.7	0.1		50.1	0.3	49.7	0		29	70.9	0	0.2		0	66.7	33.3	0		
PHF	.167	.825	.822	.083	.900	.798	.167	.716	.000	.819	.774	.670	.000	.083	.741	.000	.222	.333	.000	.333	.901



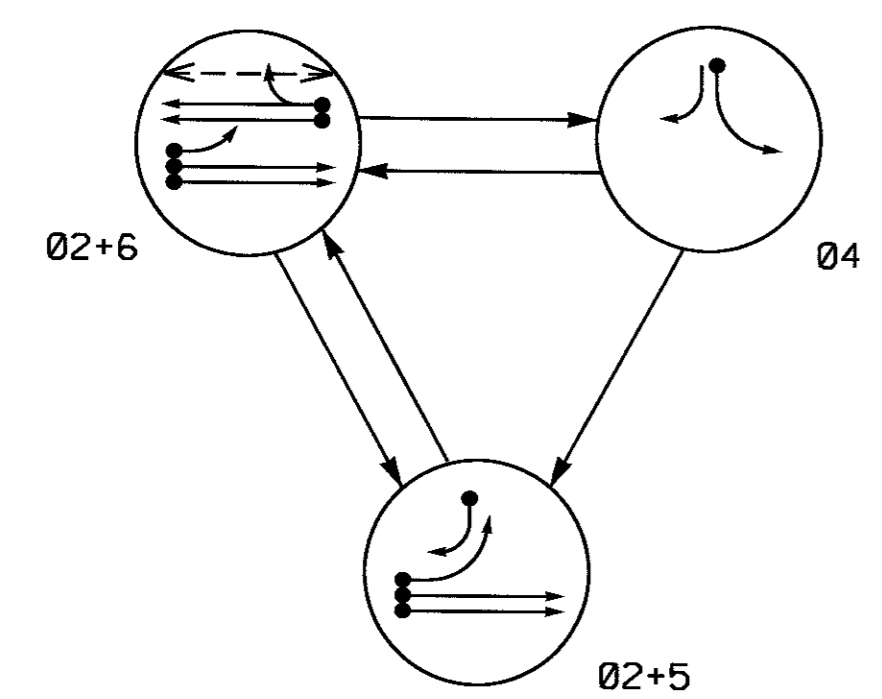
TRAFFIC DATA COLLECTION

File Name : Weddington(NC 16 and Weddington Rd)2150  
 Site Code :  
 Start Date : 1/12/2023  
 Page No : 4



## **Appendix C – Traffic Signal Plans**

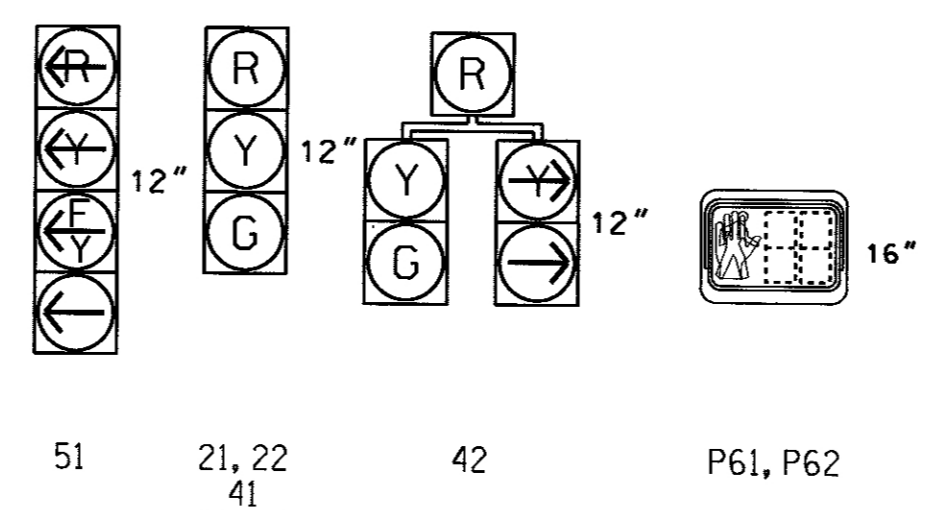
**PHASING DIAGRAM**



SIGNAL FACE	PHASE			
	02+5	02+6	04	FLASH
21, 22	G	G	R	Y
41	R	R	G	R
42	R	R	G	R
51	←	←	←	←
61, 62	R	G	R	Y
P61, P62	DW	W	DW	DRK

**SIGNAL FACE I.D.**

All Heads L.E.D.



**OASIS 2070L LOOP & DETECTOR INSTALLATION CHART**

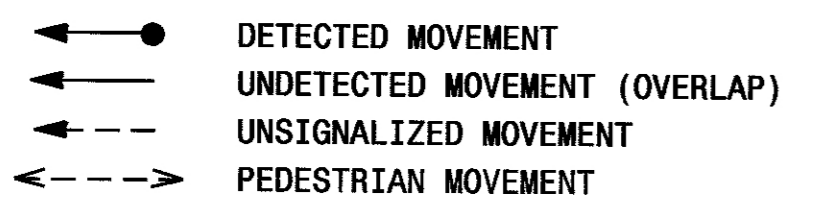
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING							
					PHASE	CALLING EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD	
2A/S11	6X6	70	3	-	2	Y	Y	-	-	-	Y	-
2B/S12	6X6	70	3	-	2	Y	Y	-	-	-	Y	-
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	3	-	-
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	-
5B	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	-
6A/S13	6X6	70	3	-	6	Y	Y	-	-	-	Y	-
6B/S14	6X6	70	3	-	6	Y	Y	-	-	-	Y	-

3 Phase Fully Actuated NC 16 (Providence Rd.) CLS

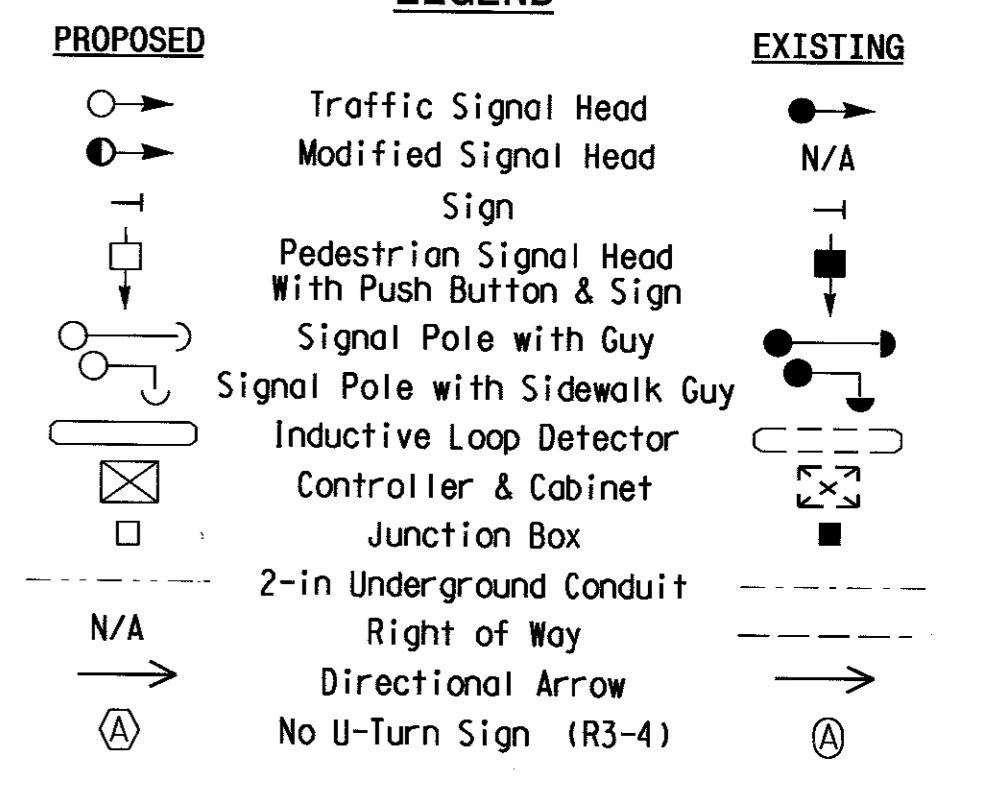
**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be lagged.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset # 2119.

**PHASING DIAGRAM DETECTION LEGEND**

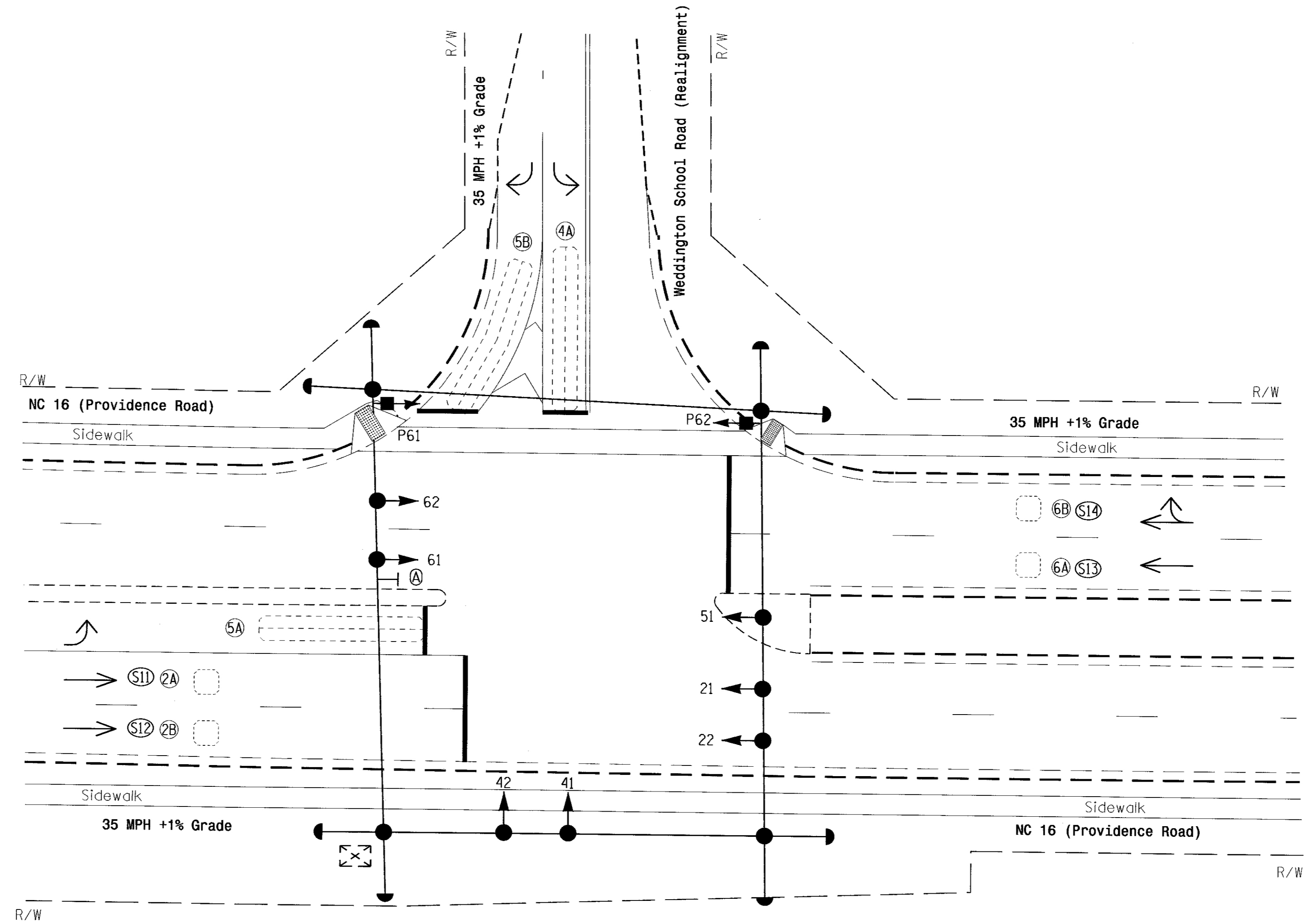


**LEGEND**



FEATURE	PHASE			
	2	4	5	6
Min Green 1 *	10	7	7	10
Extension 1 *	3.0	2.0	2.0	3.0
Max Green 1 *	50	25	20	50
Yellow Clearance	3.8	3.0	3.0	3.8
Red Clearance	1.5	2.4	2.3	1.5
Walk 1 *	-	-	-	7
Don't Walk 1	-	-	-	24
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

\* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



**Plan of Record**

PREPARED BY: M. Mahbooba DATE: October 2012  
 REVIEWED BY: T. Williams DATE: October 2012  
 SIGNATURE: *T. Williams* DATE: 10/15/12.

COMMENTS  
 Relocated cabinet to the SW quadrant.

This plan of record reflects existing field conditions as submitted by field personnel. This plan may have been modified from its original state.

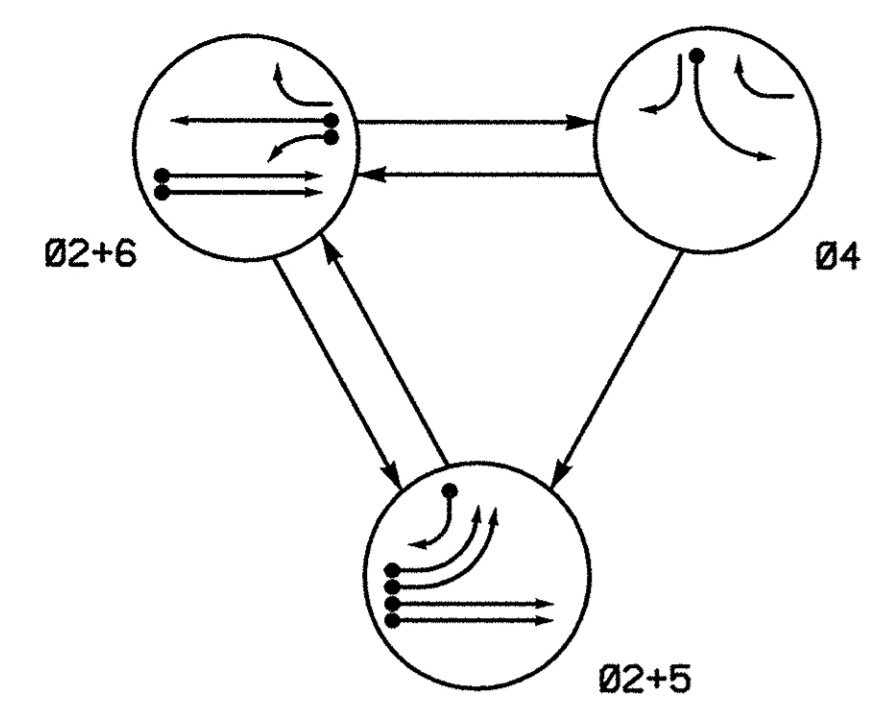
**Signal Upgrade**

	NC 16 (Providence Road) at Weddington School Road (Realignment)		Not a certified document. This document originally issued and sealed by Timothy J. Williams, PE 24393 on 2/28/2012. This document shall not be considered a certified document.
	Division 10 Mecklenburg County Weddington	PLAN DATE: February 2012	
PREPARED BY: M. Mahbooba	REVIEWED BY:	REVISIONS	INIT. DATE
SCALE 0 20 1" = 20'	SIG. INVENTORY NO. 10-2119		

15-Oct-2012 08:28 S:\1\SS\WMTS\SIGNALS\451\gn1\_bas\gn1\_bas1\0-2119\02119RPS\_Sig.dgn 20121015.dgn mmahbooba

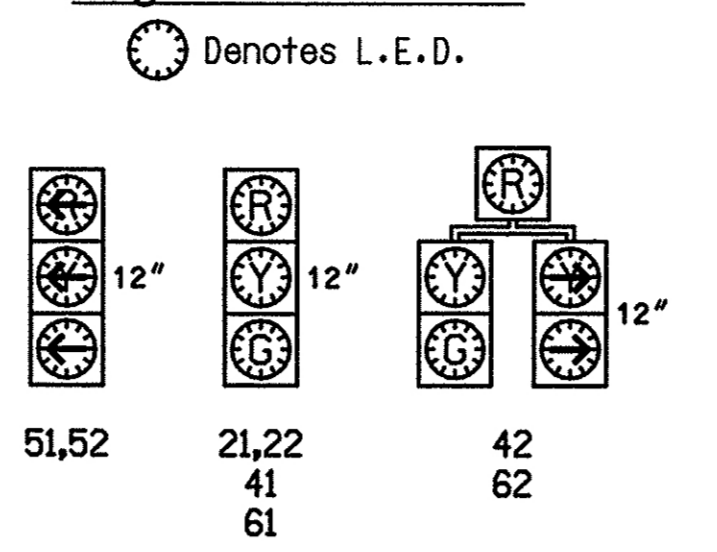


**PHASING DIAGRAM**



SIGNAL FACE	PHASE			
	Ø 2+5	Ø 2+6	Ø 4	PHASE
21,22	G	G	R	Y
41	R	R	G	R
42	R	G	R	R
51,52	-	R	R	R
61	R	G	R	Y
62	R	G	R	Y

**Signal Face I.D.**



**2070L LOOP & DETECTOR INSTALLATION**

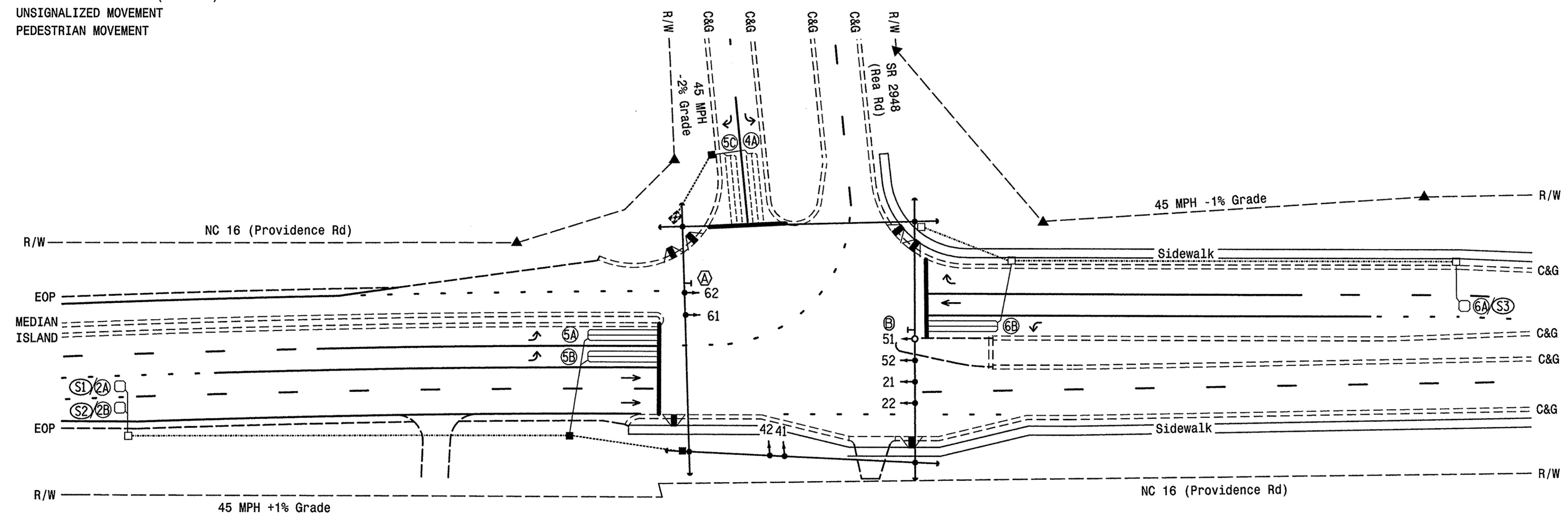
LOOP	SIZE	DISTANCE FROM STOPBAR (FT)	TURNS	DETECTOR PROGRAMMING								
				NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A/S1	6X6	300	5	Y	2	Y	Y	-	-	-	Y	-
2B/S2	6X6	300	5	Y	2	Y	Y	-	-	-	Y	-
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	-	-	-
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	-	-	-
5C	6X40	0	2-4-2	-	5	Y	Y	-	-	10	-	-
6A/S3	6X6	300	5	Y	6	Y	Y	-	-	-	Y	-
6B	6X40	0	2-4-2	Y	6	Y	Y	-	-	3	-	Y

3 Phase Fully Actuated (NC 16 - Providence Rd CLS)

**PHASING DIAGRAM DETECTION LEGEND**

- ←●→ DETECTED MOVEMENT
- ←○→ UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- ←- - -> PEDESTRIAN MOVEMENT

- NOTES**
- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
  - Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
  - Enable Backup Protect for phase 2 to allow the controller to clear from phase 2+6 to phase 2+5 by progressing through an all red display.
  - Reposition existing signal heads numbered 21, 22, 52, 61 and 62.
  - Set all detector units to presence mode.
  - Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
  - Closed loop system data: Controller Asset #1694.



FEATURE	PHASE			
	2	4	5	6
Min Green 1 *	12	7	7	12
Extension 1 *	6.0	2.0	2.0	6.0
Max Green 1 *	60	20	20	60
Yellow Clearance	4.4	4.7	3.0	4.6
Red Clearance	2.0	1.7	3.6	1.9
Red Revert	5.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	1.5	-	-	2.5
Max Variable Initial *	34	-	-	34
Time Before Reduction *	15	-	-	15
Time To Reduce *	30	-	-	30
Minimum Gap	3.0	-	-	3.0
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

\* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

PROPOSED	EXISTING
	N/A
N/A	
N/A	
	N/A
N/A	

**Final Signal**

	NC 16 (Providence Rd) at SR 2948 (Rea Rd)		
	Division 10 Union County Weddington	PLAN DATE: July 2007	
PREPARED BY: T.R. Terrell	REVIEWED BY: S.T. Franklin	REVISIONS	INIT. DATE
	SCALE 0 40 1"=40'	SIGNATURE: <i>Spencer T. Franklin</i>	DATE: 7-27-07
HNTB HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609		SIG. INVENTORY NO. 10-1694	DATE: 7-27-07

PHASING DIAGRAM

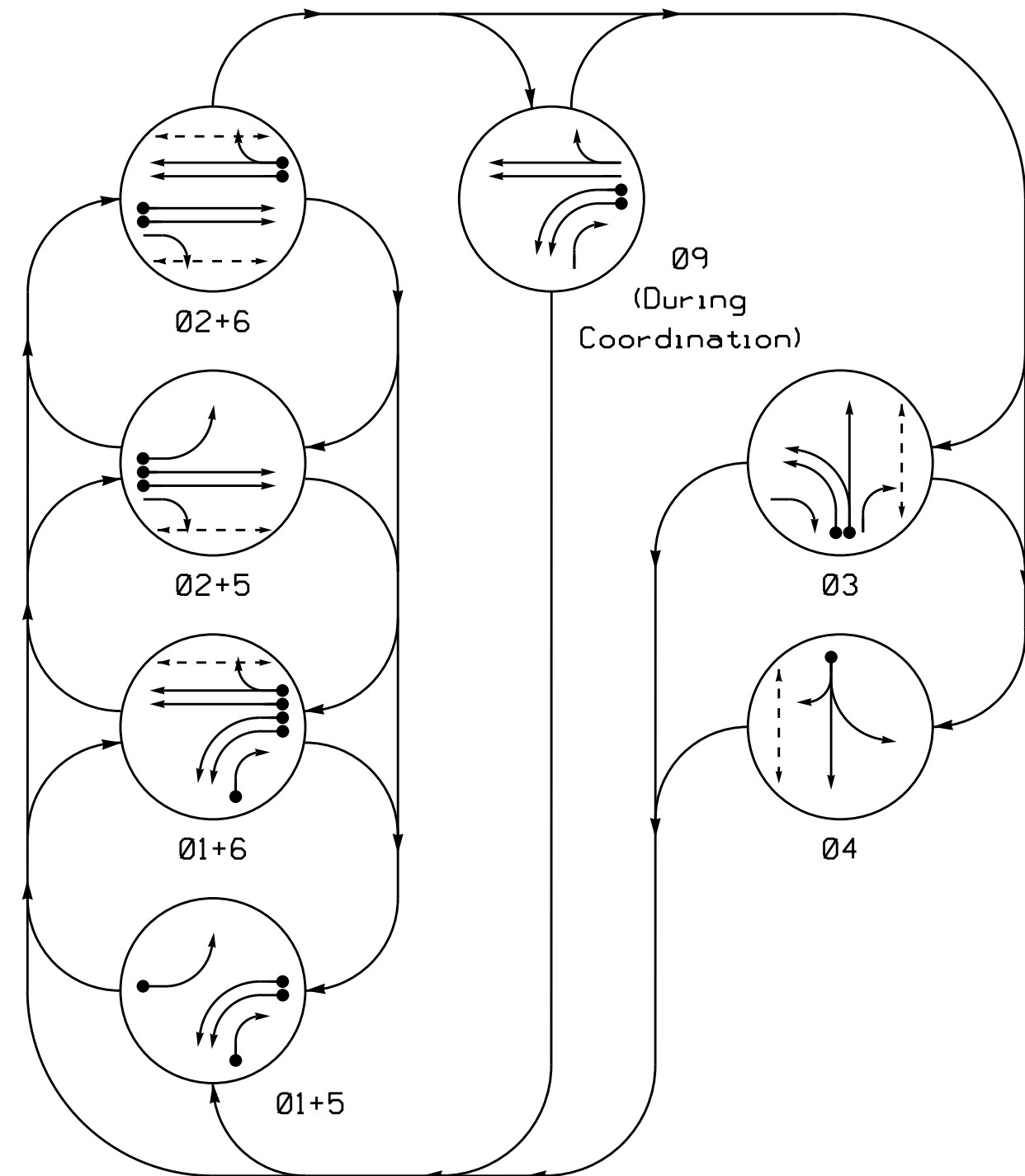
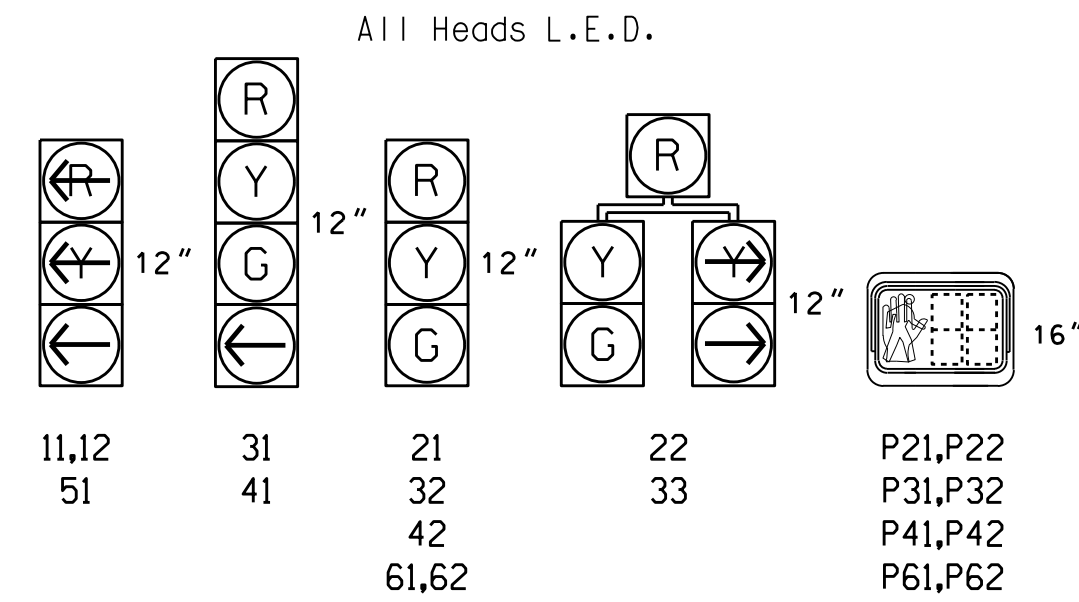


TABLE OF OPERATION

SIGNAL FACE	PHASE							F	L	S
	01+5	01+6	02+5	02+6	03	04	09			
11,12	←	←	←	←	←	←	←			
21	R	R	G	G	R	R	R	Y		
22	R	R	G	G	R	R	R	Y		
31	R	R	R	R	R	R	R			
32	R	R	R	R	R	R	R			
33	R	R	R	R	R	R	R			
41	R	R	R	R	R	R	R			
42	R	R	R	R	R	R	R			
51	←	←	←	←	←	←	←			
61,62	R	G	R	G	R	R	Y			
P21,P22	DW	DW	W	W	DW	DW	DRK			
P31,P32	DW	DW	DW	DW	DW	W	DRK			
P41,P42	DW	DW	DW	DW	DW	W	DRK			
P61,P62	DW	W	DW	W	DW	DW	DRK			

W - Walk  
DW - Don't Walk  
DRK - Dark

SIGNAL FACE I.D.



2070L LOOP & DETECTOR INSTALLATION

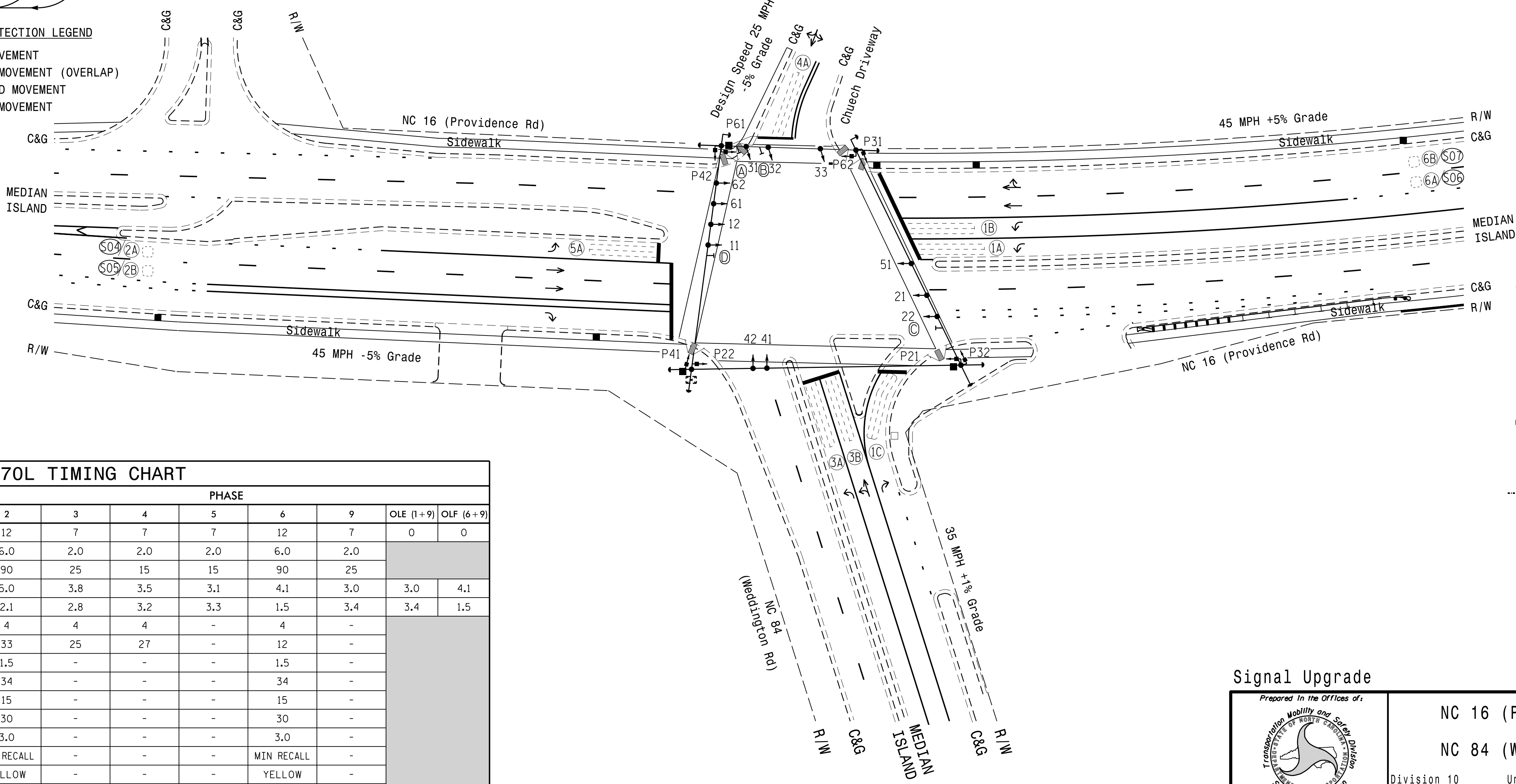
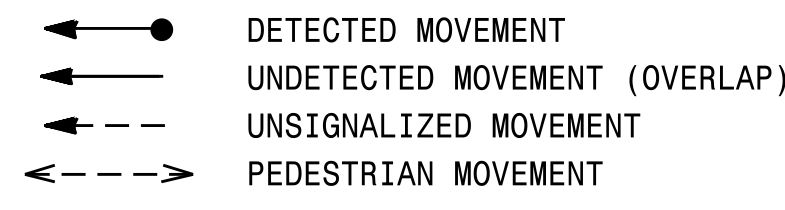
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	STRETCH TIME		
1A	6x40	0	2-4-2	-	1/9	Y	-	-	-	-
1B	6x40	0	2-4-2	-	1/9	Y	-	-	-	-
1C	6x40	0	2-4-2	-	1	Y	-	-	15	-
2A/S4	6x6	300	5	-	2	Y	Y	-	-	Y
2B/S5	6x6	300	5	-	2	Y	Y	-	-	Y
3A	6x40	0	2-4-2	-	3	Y	Y	-	-	-
3B	6x40	0	2-4-2	-	3	Y	Y	-	-	-
4A	6x40	0	2-4-2	-	4	Y	Y	-	10	-
5A	6x40	0	2-4-2	-	5	Y	Y	-	-	-
6A/S6	6x6	300	5	-	6	Y	Y	-	-	Y
6B/S7	6x6	300	5	-	6	Y	Y	-	-	Y

6 Phase Fully Actuated NC 16 (Providence Rd) CLS

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 or phase 5 may be lagged.
- The order of phase 3 and phase 4 may be reversed.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- This signal utilizes a special ring configuration. See electrical details.
- Phase 9 is used only during coordination.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset #0907.

PHASING DIAGRAM DETECTION LEGEND



LEGEND

PROPOSED	EXISTING
	N/A

2070L TIMING CHART

FEATURE	PHASE							OLE (1+9)	OLF (6+9)
	1	2	3	4	5	6	9		
Min Green 1*	7	12	7	7	7	12	7	0	0
Extension 1*	2.0	6.0	2.0	2.0	2.0	6.0	2.0		
Max Green 1*	25	90	25	15	15	90	25		
Yellow Clearance	3.0	5.0	3.8	3.5	3.1	4.1	3.0	3.0	4.1
Red Clearance	3.4	2.1	2.8	3.2	3.3	1.5	3.4	3.4	1.5
Walk 1*	-	4	4	4	-	4	-		
Don't Walk 1	-	33	25	27	-	12	-		
Seconds Per Actuation*	-	1.5	-	-	-	1.5	-		
Max Variable Initial*	-	34	-	-	-	34	-		
Time Before Reduction*	-	15	-	-	-	15	-		
Time To Reduce*	-	30	-	-	-	30	-		
Minimum Gap	-	3.0	-	-	-	3.0	-		
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-		
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-		
Dual Entry	-	-	-	-	-	-	-		
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON		

\* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

**NC 16 (Providence Rd) at NC 84 (Weddington Rd)**

Division 10 Union County Weddington

PLAN DATE: August 2015 REVIEWED BY: Z. Little

PREPARED BY: M. Mahbooba REVIEWED BY:

SEAL

**Z. LITTLE**

PROFESSIONAL ENGINEER

030530

10/14/2015

DATE

SIG. INVENTORY NO. 10-0907

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE 0 40

1"=40'

14-0076-2015 10/14/2015  
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 10/14/2015 10:13:33 AM  
 mmb00000

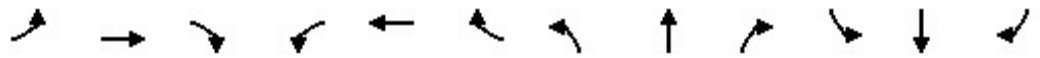
## **Appendix D – Synchro / SimTraffic Analysis Outputs**

## **2023 Existing Traffic Volumes**

Liberty Classical Academy

1: Providence Road S & Church Parking Lot/Weddington Road

04/07/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙	↘	↗	↖	↕	↗	↖	↕	↖
Traffic Volume (vph)	45	25	4	368	15	393	16	961	199	263	619	4
Future Volume (vph)	45	25	4	368	15	393	16	961	199	263	619	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			1%			-5%			5%	
Storage Length (ft)	0		0	550		325	550		450	450		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	0.95
Fr <sub>t</sub>		0.993				0.850			0.850		0.999	
Fl <sub>t</sub> Protected		0.970		0.950	0.956		0.950			0.950		
Satd. Flow (prot)	0	1839	0	1673	1683	1575	1814	3628	1623	3347	3447	0
Fl <sub>t</sub> Permitted		0.689		0.950	0.956		0.950			0.950		
Satd. Flow (perm)	0	1306	0	1673	1683	1575	1814	3628	1623	3347	3447	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		1005			826			1141			1010	
Travel Time (s)		27.4			16.1			22.2			19.7	
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)	50	28	4	409	17	437	18	1068	221	292	688	4
Shared Lane Traffic (%)				48%								
Lane Group Flow (vph)	0	82	0	213	213	437	18	1068	221	292	692	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.97	0.97	0.97	1.01	1.01	1.01	0.97	0.97	0.97	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases		4		3	3	1	5	2	3	1	6	
Permitted Phases	4					3			2			
Detector Phase	4	4		3	3	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	
Minimum Split (s)	35.7	35.7		13.6	13.6	13.4	37.4	44.1	13.6	13.4	21.6	
Total Split (s)	15.0	15.0		25.0	25.0	25.0	15.0	90.0	25.0	25.0	90.0	
Total Split (%)	9.7%	9.7%		16.1%	16.1%	16.1%	9.7%	58.1%	16.1%	16.1%	58.1%	
Maximum Green (s)	8.3	8.3		18.4	18.4	18.6	8.6	82.9	18.4	18.6	84.4	
Yellow Time (s)	3.5	3.5		3.8	3.8	3.0	3.1	5.0	3.8	3.0	4.1	
All-Red Time (s)	3.2	3.2		2.8	2.8	3.4	3.3	2.1	2.8	3.4	1.5	
Lost Time Adjust (s)		-1.7		-1.6	-1.6	-1.4	-1.4	-2.1	-1.6	-1.4	-0.6	
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	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	6.0	2.0	2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	

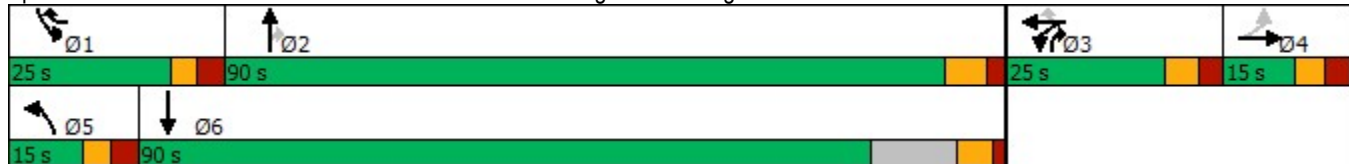


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	
Recall Mode	None	None		None	None	None	None	Min	None	None	Min	
Walk Time (s)	4.0	4.0					4.0	4.0			4.0	
Flash Dont Walk (s)	25.0	25.0					27.0	33.0			12.0	
Pedestrian Calls (#/hr)	0	0					0	0			0	
Act Effct Green (s)		10.0		20.1	20.1	40.1	8.5	37.3	62.3	20.1	57.3	
Actuated g/C Ratio		0.09		0.19	0.19	0.37	0.08	0.35	0.58	0.19	0.53	
v/c Ratio		0.68		0.68	0.68	0.74	0.13	0.85	0.23	0.47	0.38	
Control Delay		76.3		54.5	54.1	29.1	50.9	39.7	11.5	42.9	16.2	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		76.3		54.5	54.1	29.1	50.9	39.7	11.5	42.9	16.2	
LOS		E		D	D	C	D	D	B	D	B	
Approach Delay		76.3			41.5			35.1			24.1	
Approach LOS		E			D			D			C	
Queue Length 50th (ft)		55		144	144	171	12	354	69	92	123	
Queue Length 95th (ft)		#146		#276	#275	#340	37	435	109	148	213	
Internal Link Dist (ft)		925			746			1061			930	
Turn Bay Length (ft)				550		325	550		450	450		
Base Capacity (vph)		121		312	314	588	169	2878	941	624	3056	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.68		0.68	0.68	0.74	0.11	0.37	0.23	0.47	0.23	

Intersection Summary

Area Type: Other  
 Cycle Length: 155  
 Actuated Cycle Length: 107.5  
 Natural Cycle: 120  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.85  
 Intersection Signal Delay: 34.5  
 Intersection LOS: C  
 Intersection Capacity Utilization 69.2%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Providence Road S & Church Parking Lot/Weddington Road



Liberty Classical Academy  
2: Providence Road S & Lenny Stadler Way

04/07/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	38	28	73	1203	928	59
Future Volume (vph)	38	28	73	1203	928	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	1%			1%	1%	
Storage Length (ft)	0	50	325			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.991	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1761	1575	1761	3522	3490	0
Flt Permitted	0.950		0.198			
Satd. Flow (perm)	1761	1575	367	3522	3490	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			35	35	
Link Distance (ft)	1059			2837	1141	
Travel Time (s)	20.6			55.3	22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	42	31	81	1337	1031	66
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	31	81	1337	1097	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15	9	15			9
Turn Type	Prot	pm+ov	D.P+P	NA	NA	
Protected Phases	4	5	5	2	6	
Permitted Phases		4	6			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	10.0	10.0	
Minimum Split (s)	12.4	12.3	12.3	15.3	36.3	
Total Split (s)	25.0	20.0	20.0	50.0	50.0	
Total Split (%)	26.3%	21.1%	21.1%	52.6%	52.6%	
Maximum Green (s)	19.6	14.7	14.7	44.7	44.7	
Yellow Time (s)	3.0	3.0	3.0	3.8	3.8	
All-Red Time (s)	2.4	2.3	2.3	1.5	1.5	
Lost Time Adjust (s)	-0.4	-0.3	-0.3	-0.3	-0.3	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	
Recall Mode	None	None	None	Min	Min	

Liberty Classical Academy  
 2: Providence Road S & Lenny Stadler Way

04/07/2023

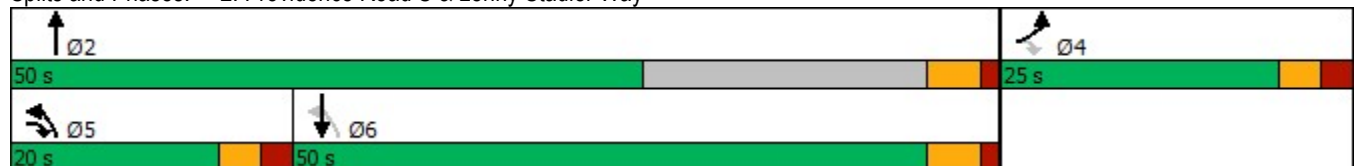


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Walk Time (s)					7.0	
Flash Dont Walk (s)					24.0	
Pedestrian Calls (#/hr)					0	
Act Effct Green (s)	8.0	11.8	31.2	38.7	27.0	
Actuated g/C Ratio	0.18	0.27	0.70	0.87	0.61	
v/c Ratio	0.13	0.07	0.16	0.44	0.52	
Control Delay	20.8	12.7	3.4	3.0	9.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	20.8	12.7	3.4	3.0	9.5	
LOS	C	B	A	A	A	
Approach Delay	17.4			3.0	9.5	
Approach LOS	B			A	A	
Queue Length 50th (ft)	7	5	0	0	66	
Queue Length 95th (ft)	38	22	17	138	205	
Internal Link Dist (ft)	979			2757	1061	
Turn Bay Length (ft)		50	325			
Base Capacity (vph)	840	709	788	3522	3214	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.05	0.04	0.10	0.38	0.34	

Intersection Summary

Area Type:	Other
Cycle Length:	95
Actuated Cycle Length:	44.4
Natural Cycle:	65
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.52
Intersection Signal Delay:	6.2
Intersection LOS:	A
Intersection Capacity Utilization:	51.7%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 2: Providence Road S & Lenny Stadler Way





Liberty Classical Academy  
3: Providence Road S & Rae Road

04/07/2023



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	336	189	343	947	4	550	323
Future Volume (vph)	336	189	343	947	4	550	323
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-2%			1%		-1%	
Storage Length (ft)	0	0	450		325		0
Storage Lanes	1	1	2		1		1
Taper Length (ft)	100		100		100		
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00	1.00
Fr <sub>t</sub>		0.850					0.850
Fl <sub>t</sub> Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1787	1599	3416	3522	1778	1872	1591
Fl <sub>t</sub> Permitted	0.950		0.950		0.272		
Satd. Flow (perm)	1787	1599	3416	3522	509	1872	1591
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	45			45		45	
Link Distance (ft)	1371			1071		2837	
Travel Time (s)	20.8			16.2		43.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	373	210	381	1052	4	611	359
Shared Lane Traffic (%)							
Lane Group Flow (vph)	373	210	381	1052	4	611	359
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	R NA	Left	Right
Median Width(ft)	12			24		24	
Link Offset(ft)	0			0		0	
Crosswalk Width(ft)	16			16		16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15	9	15		9		9
Turn Type	Prot	pm+ov	Prot	NA	Perm	NA	pm+ov
Protected Phases	4	5	5	2		6	4
Permitted Phases		4			6		6
Detector Phase	4	5	5	2	6	6	4
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	7.0
Minimum Split (s)	13.4	13.6	13.6	18.4	18.5	18.5	13.4
Total Split (s)	20.0	20.0	20.0	60.0	60.0	60.0	20.0
Total Split (%)	20.0%	20.0%	20.0%	60.0%	60.0%	60.0%	20.0%
Maximum Green (s)	13.6	13.4	13.4	53.6	53.5	53.5	13.6
Yellow Time (s)	4.7	3.0	3.0	4.4	4.6	4.6	4.7
All-Red Time (s)	1.7	3.6	3.6	2.0	1.9	1.9	1.7
Lost Time Adjust (s)	-1.4	-1.6	-1.6	-1.4	-1.5	-1.5	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	6.0	6.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0

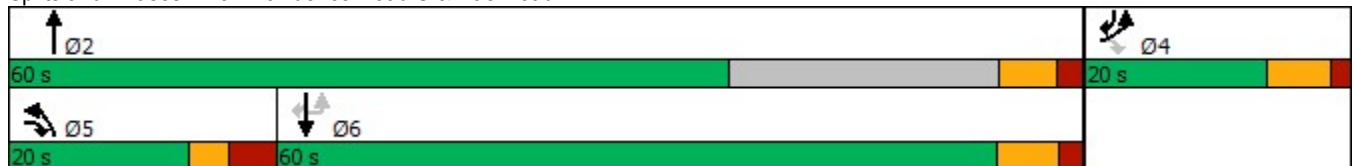


Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	30.0	30.0	30.0	0.0
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	15.3	33.7	13.4	48.9	30.4	30.4	50.8
Actuated g/C Ratio	0.21	0.45	0.18	0.66	0.41	0.41	0.68
v/c Ratio	1.02	0.29	0.62	0.45	0.02	0.80	0.33
Control Delay	86.5	16.1	34.5	6.6	12.5	27.7	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.5	16.1	34.5	6.6	12.5	27.7	5.8
LOS	F	B	C	A	B	C	A
Approach Delay	61.1			14.0	19.6		
Approach LOS	E			B	B		
Queue Length 50th (ft)	~180	57	82	104	1	241	59
Queue Length 95th (ft)	#431	136	151	135	7	365	97
Internal Link Dist (ft)	1291			991	2757		
Turn Bay Length (ft)				450	325		
Base Capacity (vph)	366	766	701	3366	383	1409	1087
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.27	0.54	0.31	0.01	0.43	0.33

**Intersection Summary**

Area Type: Other  
 Cycle Length: 100  
 Actuated Cycle Length: 74.3  
 Natural Cycle: 70  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.02  
 Intersection Signal Delay: 25.0  
 Intersection LOS: C  
 Intersection Capacity Utilization 69.8%  
 ICU Level of Service C  
 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: 3: Providence Road S & Rae Road**



Liberty Classical Academy  
4: Weddington Road & Wheatberry Hill Drive

04/07/2023

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	377	686	7	5	10
Future Vol, veh/h	5	377	686	7	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	125	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	419	762	8	6	11

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	770	0	-	0	1193 762
Stage 1	-	-	-	-	762 -
Stage 2	-	-	-	-	431 -
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	844	-	-	-	206 405
Stage 1	-	-	-	-	461 -
Stage 2	-	-	-	-	655 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	844	-	-	-	205 405
Mov Cap-2 Maneuver	-	-	-	-	205 -
Stage 1	-	-	-	-	458 -
Stage 2	-	-	-	-	655 -

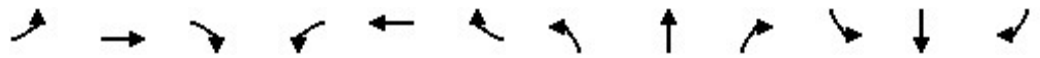
Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	17.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	844	-	-	-	306
HCM Lane V/C Ratio	0.007	-	-	-	0.054
HCM Control Delay (s)	9.3	-	-	-	17.4
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Liberty Classical Academy

1: Providence Road S & Church Parking Lot/Weddington Road

04/07/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙	↖	↗	↘	↕	↗	↘	↕	↘
Traffic Volume (vph)	6	10	4	270	4	341	4	759	322	416	841	4
Future Volume (vph)	6	10	4	270	4	341	4	759	322	416	841	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			1%			-5%			5%	
Storage Length (ft)	0		0	550		325	550		450	450		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	0.95
Frt		0.975				0.850			0.850		0.999	
Flt Protected		0.984		0.950	0.954		0.950			0.950		
Satd. Flow (prot)	0	1832	0	1673	1680	1575	1814	3628	1623	3347	3447	0
Flt Permitted		0.834		0.950	0.954		0.950			0.950		
Satd. Flow (perm)	0	1553	0	1673	1680	1575	1814	3628	1623	3347	3447	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		1005			826			1141			1010	
Travel Time (s)		27.4			16.1			22.2			19.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	11	4	300	4	379	4	843	358	462	934	4
Shared Lane Traffic (%)				49%								
Lane Group Flow (vph)	0	22	0	153	151	379	4	843	358	462	938	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.97	0.97	0.97	1.01	1.01	1.01	0.97	0.97	0.97	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases		4		3	3	1	5	2	3	1	6	
Permitted Phases	4					3			2			
Detector Phase	4	4		3	3	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	
Minimum Split (s)	35.7	35.7		13.6	13.6	13.4	37.4	44.1	13.6	13.4	21.6	
Total Split (s)	15.0	15.0		25.0	25.0	25.0	15.0	90.0	25.0	25.0	90.0	
Total Split (%)	9.7%	9.7%		16.1%	16.1%	16.1%	9.7%	58.1%	16.1%	16.1%	58.1%	
Maximum Green (s)	8.3	8.3		18.4	18.4	18.6	8.6	82.9	18.4	18.6	84.4	
Yellow Time (s)	3.5	3.5		3.8	3.8	3.0	3.1	5.0	3.8	3.0	4.1	
All-Red Time (s)	3.2	3.2		2.8	2.8	3.4	3.3	2.1	2.8	3.4	1.5	
Lost Time Adjust (s)		-1.7		-1.6	-1.6	-1.4	-1.4	-2.1	-1.6	-1.4	-0.6	
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	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	6.0	2.0	2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	

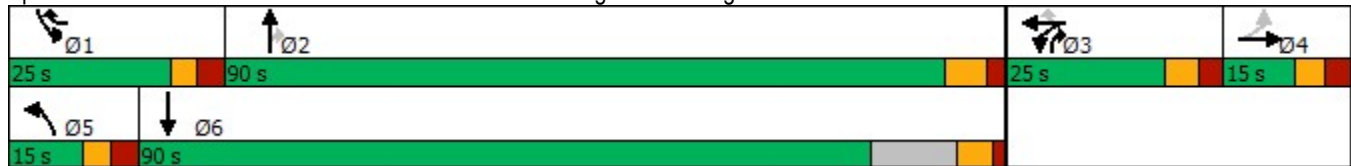


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	
Recall Mode	None	None		None	None	None	None	Min	None	None	Min	
Walk Time (s)	4.0	4.0					4.0	4.0			4.0	
Flash Dont Walk (s)	25.0	25.0					27.0	33.0			12.0	
Pedestrian Calls (#/hr)	0	0					0	0			0	
Act Effct Green (s)		9.2		14.3	14.3	38.6	8.7	26.9	46.3	20.8	50.7	
Actuated g/C Ratio		0.11		0.17	0.17	0.47	0.11	0.33	0.56	0.25	0.62	
v/c Ratio		0.13		0.53	0.52	0.51	0.02	0.71	0.39	0.55	0.44	
Control Delay		41.9		40.6	40.3	16.2	41.8	29.0	12.1	32.8	11.9	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		41.9		40.6	40.3	16.2	41.8	29.0	12.1	32.8	11.9	
LOS		D		D	D	B	D	C	B	C	B	
Approach Delay		41.9			27.0			24.0			18.8	
Approach LOS		D			C			C			B	
Queue Length 50th (ft)		10		69	69	110	2	175	77	98	87	
Queue Length 95th (ft)		39		164	163	204	13	325	186	206	311	
Internal Link Dist (ft)		925			746			1061			930	
Turn Bay Length (ft)				550		325	550		450	450		
Base Capacity (vph)		196		422	424	739	229	3408	1044	846	3376	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.11		0.36	0.36	0.51	0.02	0.25	0.34	0.55	0.28	

Intersection Summary

Area Type:	Other
Cycle Length:	155
Actuated Cycle Length:	82.1
Natural Cycle:	120
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.71
Intersection Signal Delay:	22.5
Intersection LOS:	C
Intersection Capacity Utilization:	60.4%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 1: Providence Road S & Church Parking Lot/Weddington Road



Liberty Classical Academy  
2: Providence Road S & Lenny Stadler Way

04/07/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	37	23	42	1086	1071	42
Future Volume (vph)	37	23	42	1086	1071	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	1%			1%	1%	
Storage Length (ft)	0	50	325			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Fr <sub>t</sub>		0.850			0.994	
Fl <sub>t</sub> Protected	0.950		0.950			
Satd. Flow (prot)	1761	1575	1761	3522	3500	0
Fl <sub>t</sub> Permitted	0.950		0.173			
Satd. Flow (perm)	1761	1575	321	3522	3500	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			35	35	
Link Distance (ft)	1059			2837	1141	
Travel Time (s)	20.6			55.3	22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	41	26	47	1207	1190	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	41	26	47	1207	1237	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15	9	15			9
Turn Type	Prot	pm+ov	D.P+P	NA	NA	
Protected Phases	4	5	5	2	6	
Permitted Phases		4	6			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	10.0	10.0	
Minimum Split (s)	12.4	12.3	12.3	15.3	36.3	
Total Split (s)	25.0	20.0	20.0	50.0	50.0	
Total Split (%)	26.3%	21.1%	21.1%	52.6%	52.6%	
Maximum Green (s)	19.6	14.7	14.7	44.7	44.7	
Yellow Time (s)	3.0	3.0	3.0	3.8	3.8	
All-Red Time (s)	2.4	2.3	2.3	1.5	1.5	
Lost Time Adjust (s)	-0.4	-0.3	-0.3	-0.3	-0.3	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	
Recall Mode	None	None	None	Min	Min	

Liberty Classical Academy  
 2: Providence Road S & Lenny Stadler Way

04/07/2023

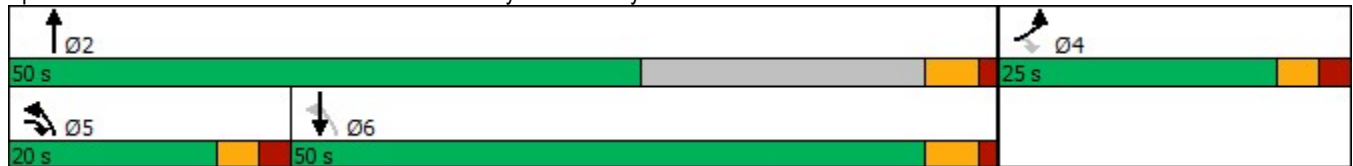


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Walk Time (s)					7.0	
Flash Dont Walk (s)					24.0	
Pedestrian Calls (#/hr)					0	
Act Effct Green (s)	8.2	11.9	34.4	40.9	33.5	
Actuated g/C Ratio	0.18	0.26	0.74	0.88	0.72	
v/c Ratio	0.13	0.06	0.10	0.39	0.49	
Control Delay	23.1	14.8	2.9	2.6	8.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	23.1	14.8	2.9	2.6	8.2	
LOS	C	B	A	A	A	
Approach Delay	19.8			2.6	8.2	
Approach LOS	B			A	A	
Queue Length 50th (ft)	9	6	0	0	79	
Queue Length 95th (ft)	40	22	11	117	240	
Internal Link Dist (ft)	979			2757	1061	
Turn Bay Length (ft)		50	325			
Base Capacity (vph)	821	686	759	3522	3144	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.05	0.04	0.06	0.34	0.39	

Intersection Summary

Area Type:	Other
Cycle Length:	95
Actuated Cycle Length:	46.4
Natural Cycle:	65
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.49
Intersection Signal Delay:	5.8
Intersection LOS:	A
Intersection Capacity Utilization:	49.1%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 2: Providence Road S & Lenny Stadler Way



Liberty Classical Academy  
3: Providence Road S & Rae Road

04/07/2023



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	433	281	200	679	4	754	314
Future Volume (vph)	433	281	200	679	4	754	314
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-2%			1%		-1%	
Storage Length (ft)	0	0	450		325		0
Storage Lanes	1	1	2		1		1
Taper Length (ft)	100		100		100		
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00	1.00
Fr <sub>t</sub>		0.850					0.850
Fl <sub>t</sub> Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1787	1599	3416	3522	1778	1872	1591
Fl <sub>t</sub> Permitted	0.950		0.950		0.366		
Satd. Flow (perm)	1787	1599	3416	3522	685	1872	1591
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	45			45		45	
Link Distance (ft)	1371			1071		2837	
Travel Time (s)	20.8			16.2		43.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	481	312	222	754	4	838	349
Shared Lane Traffic (%)							
Lane Group Flow (vph)	481	312	222	754	4	838	349
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	R NA	Left	Right
Median Width(ft)	12			24		24	
Link Offset(ft)	0			0		0	
Crosswalk Width(ft)	16			16		16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15	9	15		9		9
Turn Type	Prot	pm+ov	Prot	NA	Perm	NA	pm+ov
Protected Phases	4	5	5	2		6	4
Permitted Phases		4			6		6
Detector Phase	4	5	5	2	6	6	4
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	7.0
Minimum Split (s)	13.4	13.6	13.6	18.4	18.5	18.5	13.4
Total Split (s)	20.0	20.0	20.0	60.0	60.0	60.0	20.0
Total Split (%)	20.0%	20.0%	20.0%	60.0%	60.0%	60.0%	20.0%
Maximum Green (s)	13.6	13.4	13.4	53.6	53.5	53.5	13.6
Yellow Time (s)	4.7	3.0	3.0	4.4	4.6	4.6	4.7
All-Red Time (s)	1.7	3.6	3.6	2.0	1.9	1.9	1.7
Lost Time Adjust (s)	-1.4	-1.6	-1.6	-1.4	-1.5	-1.5	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	6.0	6.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0



Liberty Classical Academy  
 3: Providence Road S & Rae Road

04/07/2023

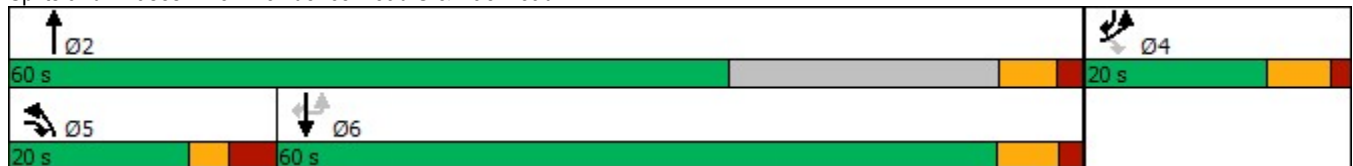


Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	30.0	30.0	30.0	0.0
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	15.4	32.2	11.7	60.2	43.4	43.4	63.8
Actuated g/C Ratio	0.18	0.38	0.14	0.70	0.51	0.51	0.74
v/c Ratio	1.51	0.52	0.48	0.31	0.01	0.89	0.30
Control Delay	272.8	26.9	39.8	4.9	10.2	31.3	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	272.8	26.9	39.8	4.9	10.2	31.3	4.4
LOS	F	C	D	A	B	C	A
Approach Delay	176.0			12.8		23.4	
Approach LOS	F			B		C	
Queue Length 50th (ft)	~376	133	58	66	1	376	49
Queue Length 95th (ft)	#658	247	104	86	6	597	91
Internal Link Dist (ft)	1291			991		2757	
Turn Bay Length (ft)			450		325		
Base Capacity (vph)	319	667	611	3057	449	1228	1183
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.51	0.47	0.36	0.25	0.01	0.68	0.30

Intersection Summary

Area Type: Other  
 Cycle Length: 100  
 Actuated Cycle Length: 85.8  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.51  
 Intersection Signal Delay: 60.8  
 Intersection LOS: E  
 Intersection Capacity Utilization 82.0%  
 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: 3: Providence Road S & Rae Road



Liberty Classical Academy  
4: Weddington Road & Wheatberry Hill Drive

04/07/2023

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	11	607	505	10	11	10
Future Vol, veh/h	11	607	505	10	11	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	125	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	674	561	11	12	11

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	572	0	-	0	1259 561
Stage 1	-	-	-	-	561 -
Stage 2	-	-	-	-	698 -
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	1001	-	-	-	188 527
Stage 1	-	-	-	-	571 -
Stage 2	-	-	-	-	494 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1001	-	-	-	186 527
Mov Cap-2 Maneuver	-	-	-	-	186 -
Stage 1	-	-	-	-	564 -
Stage 2	-	-	-	-	494 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	19.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1001	-	-	-	269
HCM Lane V/C Ratio	0.012	-	-	-	0.087
HCM Control Delay (s)	8.6	-	-	-	19.7
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.3

**Intersection: 1: Providence Road S & Church Parking Lot/Weddington Road**

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	T	R	L	L	T	TR
Maximum Queue (ft)	118	192	201	301	52	434	434	146	205	175	185	169
Average Queue (ft)	59	118	132	163	17	284	294	75	127	64	99	86
95th Queue (ft)	111	184	193	287	47	419	422	137	198	164	170	159
Link Distance (ft)	948		728			1069	1069				945	945
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		550		325	550			450	450	450		
Storage Blk Time (%)				1			1					
Queuing Penalty (veh)				3			1					

**Intersection: 2: Providence Road S & Lenny Stadler Way**

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	51	50	82	121	140	160	163
Average Queue (ft)	23	16	38	40	59	70	71
95th Queue (ft)	51	43	75	111	136	143	148
Link Distance (ft)	1007			2766	2766	1069	1069
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		50	325				
Storage Blk Time (%)	2	1					
Queuing Penalty (veh)	1	0					

**Intersection: 3: Providence Road S & Rae Road**

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	T	U	T	R
Maximum Queue (ft)	549	134	186	227	151	136	26	435	202
Average Queue (ft)	380	64	93	146	82	77	5	267	90
95th Queue (ft)	786	120	188	219	135	129	22	427	170
Link Distance (ft)	1322	1322			1034	1034		2766	2766
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			450	450			325		
Storage Blk Time (%)								5	
Queuing Penalty (veh)								0	

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Intersection: 4: Weddington Road & Wheatberry Hill Drive

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Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	21	38
Average Queue (ft)	2	13
95th Queue (ft)	15	39
Link Distance (ft)		956
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Network Summary

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Network wide Queuing Penalty: 5

Intersection: 1: Providence Road S & Church Parking Lot/Weddington Road

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	T	R	L	L	T	TR
Maximum Queue (ft)	49	109	149	230	26	220	227	179	224	189	151	160
Average Queue (ft)	14	67	82	124	4	140	147	100	158	102	70	69
95th Queue (ft)	42	108	137	216	19	211	221	172	226	205	136	142
Link Distance (ft)	948		728			1069	1069				945	945
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		550		325	550			450	450	450		
Storage Blk Time (%)			0	0								
Queuing Penalty (veh)			0	1								

Intersection: 2: Providence Road S & Lenny Stadler Way

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	56	47	55	102	133	150	141
Average Queue (ft)	23	14	23	30	53	74	68
95th Queue (ft)	52	39	53	85	126	139	134
Link Distance (ft)	1007			2766	2766	1069	1069
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		50	325				
Storage Blk Time (%)	2	1					
Queuing Penalty (veh)	0	0					

Intersection: 3: Providence Road S & Rae Road

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	T	U	T	R
Maximum Queue (ft)	1360	1355	148	177	115	116	64	580	308
Average Queue (ft)	1231	999	39	106	57	58	6	381	87
95th Queue (ft)	1562	1879	112	170	106	105	64	593	221
Link Distance (ft)	1322	1322			1034	1034		2766	2766
Upstream Blk Time (%)	64	50							
Queuing Penalty (veh)	0	0							
Storage Bay Dist (ft)			450	450			325		
Storage Blk Time (%)								16	
Queuing Penalty (veh)								1	

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Intersection: 4: Weddington Road & Wheatberry Hill Drive

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Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	30	42
Average Queue (ft)	3	19
95th Queue (ft)	17	45
Link Distance (ft)		956
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Network Summary

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Network wide Queuing Penalty: 2

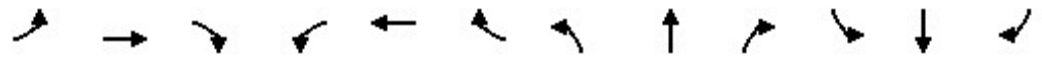
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## **2026 Background Traffic Volumes**

Liberty Classical Academy

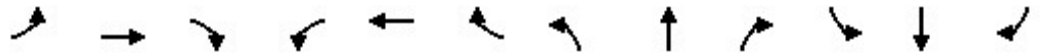
1: Providence Road S & Church Parking Lot/Weddington Road

04/07/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙	↘	↗	↖	↕	↗	↖	↕	↖
Traffic Volume (vph)	48	27	4	396	16	423	17	1035	214	283	667	4
Future Volume (vph)	48	27	4	396	16	423	17	1035	214	283	667	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			1%			-5%			5%	
Storage Length (ft)	0		0	550		325	550		450	450		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	0.95
Fr <sub>t</sub>		0.994				0.850			0.850		0.999	
Fl <sub>t</sub> Protected		0.970		0.950	0.956		0.950			0.950		
Satd. Flow (prot)	0	1841	0	1673	1683	1575	1814	3628	1623	3347	3447	0
Fl <sub>t</sub> Permitted		0.680		0.950	0.956		0.950			0.950		
Satd. Flow (perm)	0	1291	0	1673	1683	1575	1814	3628	1623	3347	3447	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		1005			826			1141			1010	
Travel Time (s)		27.4			16.1			22.2			19.7	
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)	53	30	4	440	18	470	19	1150	238	314	741	4
Shared Lane Traffic (%)				48%								
Lane Group Flow (vph)	0	87	0	229	229	470	19	1150	238	314	745	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.97	0.97	0.97	1.01	1.01	1.01	0.97	0.97	0.97	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases		4		3	3	1	5	2	3	1	6	
Permitted Phases	4					3			2			
Detector Phase	4	4		3	3	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	
Minimum Split (s)	13.7	13.7		13.6	13.6	13.4	13.4	19.1	13.6	13.4	17.6	
Total Split (s)	16.8	16.8		26.0	26.0	28.7	13.4	48.5	26.0	28.7	63.8	
Total Split (%)	14.0%	14.0%		21.7%	21.7%	23.9%	11.2%	40.4%	21.7%	23.9%	53.2%	
Maximum Green (s)	10.1	10.1		19.4	19.4	22.3	7.0	41.4	19.4	22.3	58.2	
Yellow Time (s)	3.5	3.5		3.8	3.8	3.0	3.1	5.0	3.8	3.0	4.1	
All-Red Time (s)	3.2	3.2		2.8	2.8	3.4	3.3	2.1	2.8	3.4	1.5	
Lost Time Adjust (s)		-1.7		-1.6	-1.6	-1.4	-1.4	-2.1	-1.6	-1.4	-0.6	
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	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	6.0	2.0	2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	



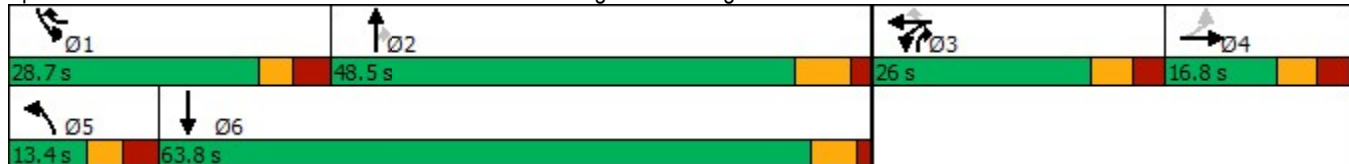


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	
Recall Mode	None	None		None	None	None	None	Min	None	None	Min	
Walk Time (s)	4.0	4.0					4.0	4.0			4.0	
Flash Dont Walk (s)	25.0	25.0					27.0	33.0			12.0	
Pedestrian Calls (#/hr)	0	0					0	0			0	
Act Effect Green (s)		11.2		18.8	18.8	37.0	8.6	38.3	62.2	18.2	56.8	
Actuated g/C Ratio		0.10		0.18	0.18	0.35	0.08	0.36	0.58	0.17	0.53	
v/c Ratio		0.64		0.78	0.78	0.86	0.13	0.89	0.25	0.55	0.41	
Control Delay		72.7		63.5	62.9	39.0	53.9	42.4	12.3	45.6	16.9	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		72.7		63.5	62.9	39.0	53.9	42.4	12.3	45.6	16.9	
LOS		E		E	E	D	D	D	B	D	B	
Approach Delay		72.7			50.9			37.5			25.4	
Approach LOS		E			D			D			C	
Queue Length 50th (ft)		63		171	171	220	14	407	78	111	145	
Queue Length 95th (ft)		#146		#309	#308	#334	39	528	132	158	242	
Internal Link Dist (ft)		925			746			1061			930	
Turn Bay Length (ft)				550		325	550		450	450		
Base Capacity (vph)		145		336	338	633	145	1511	984	759	1994	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.60		0.68	0.68	0.74	0.13	0.76	0.24	0.41	0.37	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 107  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 38.3      Intersection LOS: D  
 Intersection Capacity Utilization 73.1%      ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Providence Road S & Church Parking Lot/Weddington Road



Liberty Classical Academy  
2: Providence Road S & Lenny Stadler Way

04/07/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	41	30	79	1295	999	64
Future Volume (vph)	41	30	79	1295	999	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	1%			1%	1%	
Storage Length (ft)	0	50	325			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.991	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1761	1575	1761	3522	3490	0
Flt Permitted	0.950		0.175			
Satd. Flow (perm)	1761	1575	324	3522	3490	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			35	35	
Link Distance (ft)	1059			2837	1141	
Travel Time (s)	20.6			55.3	22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	46	33	88	1439	1110	71
Shared Lane Traffic (%)						
Lane Group Flow (vph)	46	33	88	1439	1181	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15	9	15			9
Turn Type	Prot	pm+ov	D.P+P	NA	NA	
Protected Phases	4	5	5	2	6	
Permitted Phases		4	6			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	10.0	10.0	
Minimum Split (s)	12.4	12.3	12.3	15.3	36.3	
Total Split (s)	15.0	15.0	15.0	75.0	60.0	
Total Split (%)	16.7%	16.7%	16.7%	83.3%	66.7%	
Maximum Green (s)	9.6	9.7	9.7	69.7	54.7	
Yellow Time (s)	3.0	3.0	3.0	3.8	3.8	
All-Red Time (s)	2.4	2.3	2.3	1.5	1.5	
Lost Time Adjust (s)	-0.4	-0.3	-0.3	-0.3	-0.3	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	
Recall Mode	None	None	None	Min	Min	

Liberty Classical Academy  
 2: Providence Road S & Lenny Stadler Way

04/07/2023

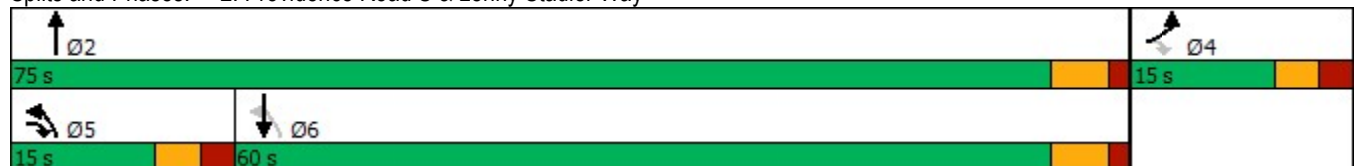


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Walk Time (s)					7.0	
Flash Dont Walk (s)					24.0	
Pedestrian Calls (#/hr)					0	
Act Effct Green (s)	8.1	11.8	32.8	40.4	28.7	
Actuated g/C Ratio	0.18	0.26	0.71	0.88	0.62	
v/c Ratio	0.15	0.08	0.19	0.46	0.54	
Control Delay	22.5	14.3	3.5	3.0	9.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	22.5	14.3	3.5	3.0	9.4	
LOS	C	B	A	A	A	
Approach Delay	19.1			3.1	9.4	
Approach LOS	B			A	A	
Queue Length 50th (ft)	9	6	0	0	74	
Queue Length 95th (ft)	42	25	18	153	223	
Internal Link Dist (ft)	979			2757	1061	
Turn Bay Length (ft)		50	325			
Base Capacity (vph)	409	503	579	3522	3390	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.11	0.07	0.15	0.41	0.35	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	46
Natural Cycle:	65
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.54
Intersection Signal Delay:	6.2
Intersection LOS:	A
Intersection Capacity Utilization:	53.8%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 2: Providence Road S & Lenny Stadler Way



Liberty Classical Academy  
3: Providence Road S & Rae Road

04/07/2023



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	362	204	369	1020	4	592	348
Future Volume (vph)	362	204	369	1020	4	592	348
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-2%			1%		-1%	
Storage Length (ft)	0	0	450		325		0
Storage Lanes	1	1	2		1		1
Taper Length (ft)	100		100		100		
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00	1.00
Fr <sub>t</sub>		0.850					0.850
Fl <sub>t</sub> Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1787	1599	3416	3522	1778	1872	1591
Fl <sub>t</sub> Permitted	0.950		0.950		0.251		
Satd. Flow (perm)	1787	1599	3416	3522	470	1872	1591
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	45			45		45	
Link Distance (ft)	1371			1071		2837	
Travel Time (s)	20.8			16.2		43.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	402	227	410	1133	4	658	387
Shared Lane Traffic (%)							
Lane Group Flow (vph)	402	227	410	1133	4	658	387
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	R NA	Left	Right
Median Width(ft)	12			24		24	
Link Offset(ft)	0			0		0	
Crosswalk Width(ft)	16			16		16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15	9	15		9		9
Turn Type	Prot	pm+ov	Prot	NA	Perm	NA	pm+ov
Protected Phases	4	5	5	2		6	4
Permitted Phases		4			6		6
Detector Phase	4	5	5	2	6	6	4
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	7.0
Minimum Split (s)	13.4	13.6	13.6	18.4	18.5	18.5	13.4
Total Split (s)	29.0	18.0	18.0	61.0	43.0	43.0	29.0
Total Split (%)	32.2%	20.0%	20.0%	67.8%	47.8%	47.8%	32.2%
Maximum Green (s)	22.6	11.4	11.4	54.6	36.5	36.5	22.6
Yellow Time (s)	4.7	3.0	3.0	4.4	4.6	4.6	4.7
All-Red Time (s)	1.7	3.6	3.6	2.0	1.9	1.9	1.7
Lost Time Adjust (s)	-1.4	-1.6	-1.6	-1.4	-1.5	-1.5	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	6.0	6.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0

Liberty Classical Academy  
 3: Providence Road S & Rae Road

04/07/2023

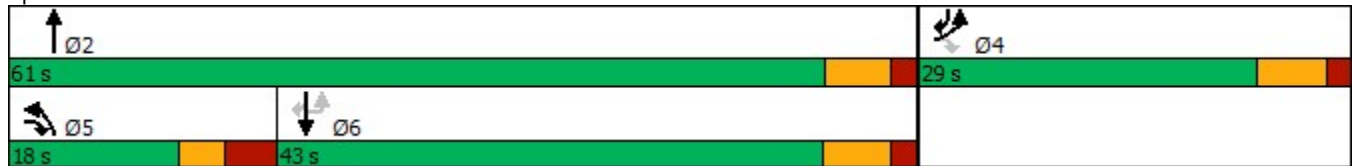


Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	30.0	30.0	30.0	0.0
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	22.0	39.9	12.8	51.3	33.4	33.4	60.5
Actuated g/C Ratio	0.26	0.48	0.15	0.61	0.40	0.40	0.72
v/c Ratio	0.85	0.30	0.78	0.52	0.02	0.88	0.34
Control Delay	49.0	15.5	47.5	10.3	15.8	38.1	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.0	15.5	47.5	10.3	15.8	38.1	4.9
LOS	D	B	D	B	B	D	A
Approach Delay	36.9			20.2	25.8		
Approach LOS	D			C	C		
Queue Length 50th (ft)	215	77	118	171	1	324	60
Queue Length 95th (ft)	#373	129	#192	220	8	#523	95
Internal Link Dist (ft)	1291			991	2757		
Turn Bay Length (ft)				450	325		
Base Capacity (vph)	521	771	539	2397	217	864	1198
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.29	0.76	0.47	0.02	0.76	0.32

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 83.5  
 Natural Cycle: 70  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.88  
 Intersection Signal Delay: 25.3      Intersection LOS: C  
 Intersection Capacity Utilization 74.2%      ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Providence Road S & Rae Road



Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗	↘	↘	↗
Traffic Vol, veh/h	5	406	739	8	5	11
Future Vol, veh/h	5	406	739	8	5	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	125	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	451	821	9	6	12

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	830	0	-	0	1284 821
Stage 1	-	-	-	-	821 -
Stage 2	-	-	-	-	463 -
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	802	-	-	-	182 374
Stage 1	-	-	-	-	432 -
Stage 2	-	-	-	-	634 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	802	-	-	-	181 374
Mov Cap-2 Maneuver	-	-	-	-	181 -
Stage 1	-	-	-	-	429 -
Stage 2	-	-	-	-	634 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	18.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	802	-	-	-	281
HCM Lane V/C Ratio	0.007	-	-	-	0.063
HCM Control Delay (s)	9.5	-	-	-	18.7
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

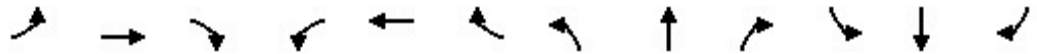
Liberty Classical Academy

1: Providence Road S & Church Parking Lot/Weddington Road

04/07/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↙	↖	↗	↘	↑↑	↗	↘↘	↑↗	
Traffic Volume (vph)	6	11	4	291	4	367	4	817	347	448	906	4
Future Volume (vph)	6	11	4	291	4	367	4	817	347	448	906	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			1%			-5%			5%	
Storage Length (ft)	0		0	550		325	550		450	450		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	0.95
Frt		0.977				0.850			0.850		0.999	
Flt Protected		0.985		0.950	0.954		0.950			0.950		
Satd. Flow (prot)	0	1837	0	1673	1680	1575	1814	3628	1623	3347	3447	0
Flt Permitted		0.835		0.950	0.954		0.950			0.950		
Satd. Flow (perm)	0	1558	0	1673	1680	1575	1814	3628	1623	3347	3447	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		1005			826			1141			1010	
Travel Time (s)		27.4			16.1			22.2			19.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	12	4	323	4	408	4	908	386	498	1007	4
Shared Lane Traffic (%)				49%								
Lane Group Flow (vph)	0	23	0	165	162	408	4	908	386	498	1011	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.97	0.97	0.97	1.01	1.01	1.01	0.97	0.97	0.97	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases		4		3	3	1	5	2	3	1	6	
Permitted Phases	4					3			2			
Detector Phase	4	4		3	3	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	
Minimum Split (s)	13.7	13.7		13.6	13.6	13.4	13.4	19.1	13.6	13.4	17.6	
Total Split (s)	13.7	13.7		26.4	26.4	33.0	13.4	46.9	26.4	33.0	66.5	
Total Split (%)	11.4%	11.4%		22.0%	22.0%	27.5%	11.2%	39.1%	22.0%	27.5%	55.4%	
Maximum Green (s)	7.0	7.0		19.8	19.8	26.6	7.0	39.8	19.8	26.6	60.9	
Yellow Time (s)	3.5	3.5		3.8	3.8	3.0	3.1	5.0	3.8	3.0	4.1	
All-Red Time (s)	3.2	3.2		2.8	2.8	3.4	3.3	2.1	2.8	3.4	1.5	
Lost Time Adjust (s)		-1.7		-1.6	-1.6	-1.4	-1.4	-2.1	-1.6	-1.4	-0.6	
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	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	6.0	2.0	2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	

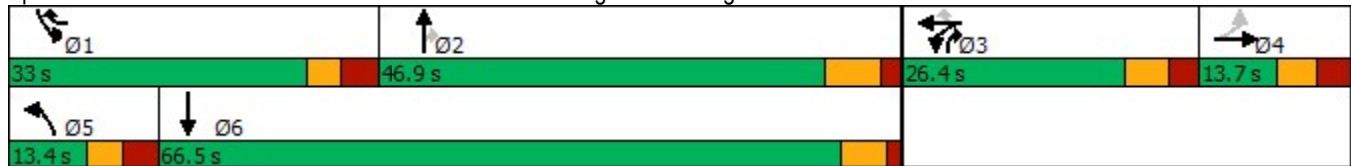


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	
Recall Mode	None	None		None	None	None	None	Min	None	None	Min	
Walk Time (s)	4.0	4.0					4.0	4.0			4.0	
Flash Dont Walk (s)	25.0	25.0					27.0	33.0			12.0	
Pedestrian Calls (#/hr)	0	0					0	0			0	
Act Effct Green (s)		9.5		15.4	15.4	39.6	9.2	30.2	51.1	20.3	54.0	
Actuated g/C Ratio		0.11		0.18	0.18	0.46	0.11	0.35	0.59	0.23	0.62	
v/c Ratio		0.14		0.56	0.54	0.57	0.02	0.72	0.40	0.63	0.47	
Control Delay		48.5		45.0	44.5	18.8	48.5	30.0	12.7	36.3	11.7	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		48.5		45.0	44.5	18.8	48.5	30.0	12.7	36.3	11.7	
LOS		D		D	D	B	D	C	B	D	B	
Approach Delay		48.5			30.4			24.9			19.8	
Approach LOS		D			C			C			B	
Queue Length 50th (ft)		11		81	80	132	2	204	89	115	104	
Queue Length 95th (ft)		45		202	197	256	15	395	234	238	338	
Internal Link Dist (ft)		925			746			1061			930	
Turn Bay Length (ft)				550		325	550		450	450		
Base Capacity (vph)		170		451	453	908	192	1918	1108	1183	2619	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.14		0.37	0.36	0.45	0.02	0.47	0.35	0.42	0.39	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 86.4  
 Natural Cycle: 75  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.72  
 Intersection Signal Delay: 24.0  
 Intersection LOS: C  
 Intersection Capacity Utilization 63.6%  
 ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 1: Providence Road S & Church Parking Lot/Weddington Road





Liberty Classical Academy  
 2: Providence Road S & Lenny Stadler Way

04/07/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	40	25	45	1170	1153	45
Future Volume (vph)	40	25	45	1170	1153	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	1%			1%	1%	
Storage Length (ft)	0	50	325			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Fr <sub>t</sub>		0.850			0.994	
Fl <sub>t</sub> Protected	0.950		0.950			
Satd. Flow (prot)	1761	1575	1761	3522	3500	0
Fl <sub>t</sub> Permitted	0.950		0.151			
Satd. Flow (perm)	1761	1575	280	3522	3500	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			35	35	
Link Distance (ft)	1059			2837	1141	
Travel Time (s)	20.6			55.3	22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	44	28	50	1300	1281	50
Shared Lane Traffic (%)						
Lane Group Flow (vph)	44	28	50	1300	1331	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15	9	15			9
Turn Type	Prot	pm+ov	D.P+P	NA	NA	
Protected Phases	4	5	5	2	6	
Permitted Phases		4	6			
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	10.0	10.0	
Minimum Split (s)	12.4	12.3	12.3	15.3	36.3	
Total Split (s)	14.0	14.0	14.0	76.0	62.0	
Total Split (%)	15.6%	15.6%	15.6%	84.4%	68.9%	
Maximum Green (s)	8.6	8.7	8.7	70.7	56.7	
Yellow Time (s)	3.0	3.0	3.0	3.8	3.8	
All-Red Time (s)	2.4	2.3	2.3	1.5	1.5	
Lost Time Adjust (s)	-0.4	-0.3	-0.3	-0.3	-0.3	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	
Recall Mode	None	None	None	Min	Min	

Liberty Classical Academy  
 2: Providence Road S & Lenny Stadler Way

04/07/2023

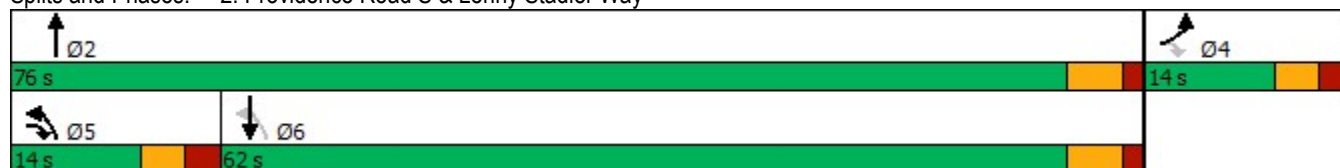


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Walk Time (s)					7.0	
Flash Dont Walk (s)					24.0	
Pedestrian Calls (#/hr)					0	
Act Effct Green (s)	8.3	11.9	36.5	43.0	35.6	
Actuated g/C Ratio	0.17	0.25	0.75	0.89	0.74	
v/c Ratio	0.15	0.07	0.11	0.42	0.52	
Control Delay	24.9	16.6	2.8	2.6	8.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	24.9	16.6	2.8	2.6	8.1	
LOS	C	B	A	A	A	
Approach Delay	21.6			2.6	8.1	
Approach LOS	C			A	A	
Queue Length 50th (ft)	10	6	0	0	88	
Queue Length 95th (ft)	45	25	12	129	266	
Internal Link Dist (ft)	979			2757	1061	
Turn Bay Length (ft)		50	325			
Base Capacity (vph)	358	447	517	3522	3337	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.12	0.06	0.10	0.37	0.40	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	48.4
Natural Cycle:	65
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.52
Intersection Signal Delay:	5.8
Intersection LOS:	A
Intersection Capacity Utilization:	51.6%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 2: Providence Road S & Lenny Stadler Way



Liberty Classical Academy  
3: Providence Road S & Rae Road

04/07/2023



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	466	303	215	731	4	812	338
Future Volume (vph)	466	303	215	731	4	812	338
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-2%			1%		-1%	
Storage Length (ft)	0	0	450		325		0
Storage Lanes	1	1	2		1		1
Taper Length (ft)	100		100		100		
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00	1.00
Frt		0.850					0.850
Flt Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1787	1599	3416	3522	1778	1872	1591
Flt Permitted	0.950		0.950		0.345		
Satd. Flow (perm)	1787	1599	3416	3522	646	1872	1591
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	45			45		45	
Link Distance (ft)	1371			1071		2837	
Travel Time (s)	20.8			16.2		43.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	518	337	239	812	4	902	376
Shared Lane Traffic (%)							
Lane Group Flow (vph)	518	337	239	812	4	902	376
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	R NA	Left	Right
Median Width(ft)	12			24		24	
Link Offset(ft)	0			0		0	
Crosswalk Width(ft)	16			16		16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15	9	15		9		9
Turn Type	Prot	pm+ov	Prot	NA	Perm	NA	pm+ov
Protected Phases	4	5	5	2		6	4
Permitted Phases		4			6		6
Detector Phase	4	5	5	2	6	6	4
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	7.0
Minimum Split (s)	13.4	13.6	13.6	18.4	18.5	18.5	13.4
Total Split (s)	36.3	13.8	13.8	73.7	59.9	59.9	36.3
Total Split (%)	33.0%	12.5%	12.5%	67.0%	54.5%	54.5%	33.0%
Maximum Green (s)	29.9	7.2	7.2	67.3	53.4	53.4	29.9
Yellow Time (s)	4.7	3.0	3.0	4.4	4.6	4.6	4.7
All-Red Time (s)	1.7	3.6	3.6	2.0	1.9	1.9	1.7
Lost Time Adjust (s)	-1.4	-1.6	-1.6	-1.4	-1.5	-1.5	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	6.0	6.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0

Liberty Classical Academy  
3: Providence Road S & Rae Road

04/07/2023

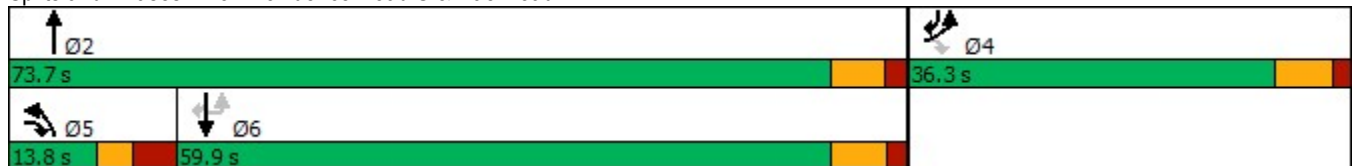


Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	30.0	30.0	30.0	0.0
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	31.3	45.1	8.8	67.7	53.9	53.9	90.2
Actuated g/C Ratio	0.29	0.41	0.08	0.62	0.49	0.49	0.83
v/c Ratio	1.01	0.51	0.87	0.37	0.01	0.98	0.29
Control Delay	81.9	27.4	79.2	10.7	14.2	52.1	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.9	27.4	79.2	10.7	14.2	52.1	2.7
LOS	F	C	E	B	B	D	A
Approach Delay	60.4			26.3		37.5	
Approach LOS	E			C		D	
Queue Length 50th (ft)	~378	175	87	136	1	594	44
Queue Length 95th (ft)	#596	263	#158	173	7	#884	65
Internal Link Dist (ft)	1291			991		2757	
Turn Bay Length (ft)				450		325	
Base Capacity (vph)	513	662	276	2221	325	943	1316
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.51	0.87	0.37	0.01	0.96	0.29

Intersection Summary

Area Type: Other  
 Cycle Length: 110  
 Actuated Cycle Length: 109  
 Natural Cycle: 110  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.01  
 Intersection Signal Delay: 40.0      Intersection LOS: D  
 Intersection Capacity Utilization 87.2%      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: 3: Providence Road S & Rae Road



Liberty Classical Academy  
4: Weddington Road & Wheatberry Hill Drive

04/07/2023

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	654	544	11	12	11
Future Vol, veh/h	12	654	544	11	12	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	125	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	13	727	604	12	13	12

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	616	0	-	0	1357 604
Stage 1	-	-	-	-	604 -
Stage 2	-	-	-	-	753 -
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	964	-	-	-	164 498
Stage 1	-	-	-	-	546 -
Stage 2	-	-	-	-	465 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	964	-	-	-	162 498
Mov Cap-2 Maneuver	-	-	-	-	162 -
Stage 1	-	-	-	-	539 -
Stage 2	-	-	-	-	465 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	21.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	964	-	-	-	239
HCM Lane V/C Ratio	0.014	-	-	-	0.107
HCM Control Delay (s)	8.8	-	-	-	21.9
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.4

Intersection: 1: Providence Road S & Church Parking Lot/Weddington Road

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	T	R	L	L	T	TR
Maximum Queue (ft)	127	225	251	336	110	542	536	274	210	179	177	166
Average Queue (ft)	70	142	162	204	21	374	384	97	139	87	103	92
95th Queue (ft)	124	218	239	337	112	537	540	264	210	190	172	164
Link Distance (ft)	948		728			1069	1069				945	945
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		550		325	550			450	450	450		
Storage Blk Time (%)			0	2		1	5					
Queuing Penalty (veh)			0	8		0	11					

Intersection: 2: Providence Road S & Lenny Stadler Way

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	65	58	88	138	159	161	184
Average Queue (ft)	28	18	42	49	71	83	88
95th Queue (ft)	58	48	79	121	152	158	171
Link Distance (ft)	1007			2766	2766	1069	1069
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		50	325				
Storage Blk Time (%)	3	2					
Queuing Penalty (veh)	1	1					

Intersection: 3: Providence Road S & Rae Road

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	T	U	T	R
Maximum Queue (ft)	321	140	206	255	202	185	61	649	297
Average Queue (ft)	202	72	132	181	112	115	12	393	95
95th Queue (ft)	316	128	218	245	186	180	110	664	241
Link Distance (ft)	1322	1322			1034	1034		2766	2766
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			450	450			325		
Storage Blk Time (%)								22	
Queuing Penalty (veh)								1	

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Intersection: 4: Weddington Road & Wheatberry Hill Drive

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Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	22	34
Average Queue (ft)	2	13
95th Queue (ft)	16	38
Link Distance (ft)		956
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Network Summary

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Network wide Queuing Penalty: 22

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Intersection: 1: Providence Road S & Church Parking Lot/Weddington Road

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	T	R	L	L	T	TR
Maximum Queue (ft)	47	158	167	254	23	326	330	244	270	223	173	172
Average Queue (ft)	18	86	97	130	3	206	215	134	177	123	82	87
95th Queue (ft)	44	144	152	227	18	316	325	220	257	233	153	162
Link Distance (ft)	948		728			1069	1069				945	945
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		550		325	550			450	450	450		
Storage Blk Time (%)	0											
Queuing Penalty (veh)	1											

Intersection: 2: Providence Road S & Lenny Stadler Way

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	59	51	70	138	166	171	170
Average Queue (ft)	24	16	31	47	64	85	85
95th Queue (ft)	53	43	62	118	153	158	158
Link Distance (ft)	1007			2766	2766	1069	1069
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		50	325				
Storage Blk Time (%)	2	1					
Queuing Penalty (veh)	1	1					

Intersection: 3: Providence Road S & Rae Road

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	T	U	T	R
Maximum Queue (ft)	768	346	205	225	192	204	68	1511	1225
Average Queue (ft)	553	167	137	171	104	101	6	1010	416
95th Queue (ft)	1004	385	214	233	175	178	64	1729	1235
Link Distance (ft)	1322	1322			1034	1034		2766	2766
Upstream Blk Time (%)	0								
Queuing Penalty (veh)	0								
Storage Bay Dist (ft)			450	450			325		
Storage Blk Time (%)								50	
Queuing Penalty (veh)								2	



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Intersection: 4: Weddington Road & Wheatberry Hill Drive

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Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	35	40
Average Queue (ft)	7	17
95th Queue (ft)	28	43
Link Distance (ft)		956
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Network Summary

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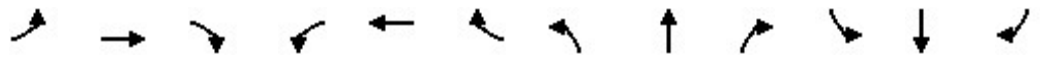
Network wide Queuing Penalty: 4

## **2028 Background Traffic Volumes**

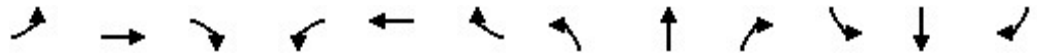
Liberty Classical Academy

1: Providence Road S & Church Parking Lot/Weddington Road

04/07/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙	↘	↗	↖	↑↑	↗	↖↖	↑↗	
Traffic Volume (vph)	51	28	4	416	17	445	18	1087	225	298	700	4
Future Volume (vph)	51	28	4	416	17	445	18	1087	225	298	700	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			1%			-5%			5%	
Storage Length (ft)	0		0	550		325	550		450	450		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	0.95
Frt		0.994				0.850			0.850		0.999	
Flt Protected		0.970		0.950	0.956		0.950			0.950		
Satd. Flow (prot)	0	1841	0	1673	1683	1575	1814	3628	1623	3347	3447	0
Flt Permitted		0.670		0.950	0.956		0.950			0.950		
Satd. Flow (perm)	0	1272	0	1673	1683	1575	1814	3628	1623	3347	3447	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		1005			826			1141			1010	
Travel Time (s)		27.4			16.1			22.2			19.7	
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)	57	31	4	462	19	494	20	1208	250	331	778	4
Shared Lane Traffic (%)				48%								
Lane Group Flow (vph)	0	92	0	240	241	494	20	1208	250	331	782	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.97	0.97	0.97	1.01	1.01	1.01	0.97	0.97	0.97	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases		4		3	3	1	5	2	3	1	6	
Permitted Phases	4					3			2			
Detector Phase	4	4		3	3	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	
Minimum Split (s)	13.7	13.7		13.6	13.6	13.4	13.4	19.1	13.6	13.4	17.6	
Total Split (s)	15.0	15.0		25.0	25.0	28.0	13.4	52.0	25.0	28.0	66.6	
Total Split (%)	12.5%	12.5%		20.8%	20.8%	23.3%	11.2%	43.3%	20.8%	23.3%	55.5%	
Maximum Green (s)	8.3	8.3		18.4	18.4	21.6	7.0	44.9	18.4	21.6	61.0	
Yellow Time (s)	3.5	3.5		3.8	3.8	3.0	3.1	5.0	3.8	3.0	4.1	
All-Red Time (s)	3.2	3.2		2.8	2.8	3.4	3.3	2.1	2.8	3.4	1.5	
Lost Time Adjust (s)		-1.7		-1.6	-1.6	-1.4	-1.4	-2.1	-1.6	-1.4	-0.6	
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	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	6.0	2.0	2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	

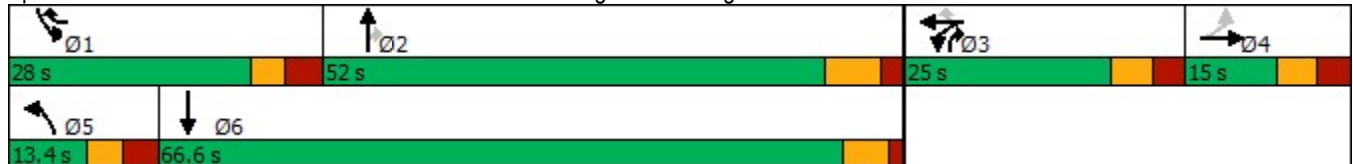


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	
Recall Mode	None	None		None	None	None	None	Min	None	None	Min	
Walk Time (s)	4.0	4.0					4.0	4.0			4.0	
Flash Dont Walk (s)	25.0	25.0					27.0	33.0			12.0	
Pedestrian Calls (#/hr)	0	0					0	0			0	
Act Effct Green (s)		10.1		19.0	19.0	38.7	8.5	41.3	65.4	19.7	61.2	
Actuated g/C Ratio		0.09		0.17	0.17	0.35	0.08	0.37	0.59	0.18	0.55	
v/c Ratio		0.79		0.83	0.83	0.89	0.14	0.89	0.26	0.56	0.41	
Control Delay		93.9		70.6	70.3	45.0	54.6	42.0	11.9	46.2	15.8	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		93.9		70.6	70.3	45.0	54.6	42.0	11.9	46.2	15.8	
LOS		F		E	E	D	D	D	B	D	B	
Approach Delay		93.9			57.6			37.1			24.8	
Approach LOS		F			E			D			C	
Queue Length 50th (ft)		71		190	190	249	15	443	86	118	144	
Queue Length 95th (ft)		#172		#344	#344	#442	41	538	132	167	244	
Internal Link Dist (ft)		925			746			1061			930	
Turn Bay Length (ft)				550		325	550		450	450		
Base Capacity (vph)		117		306	308	604	139	1565	979	706	2020	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.79		0.78	0.78	0.82	0.14	0.77	0.26	0.47	0.39	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 110.5  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 40.3  
 Intersection LOS: D  
 Intersection Capacity Utilization 75.9%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Providence Road S & Church Parking Lot/Weddington Road



Liberty Classical Academy  
2: Providence Road S & Lenny Stadler Way

04/07/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	43	32	83	1361	1050	67
Future Volume (vph)	43	32	83	1361	1050	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	1%			1%	1%	
Storage Length (ft)	0	50	325			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.991	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1761	1575	1761	3522	3490	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1761	1575	1761	3522	3490	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			35	35	
Link Distance (ft)	1059			2837	1141	
Travel Time (s)	20.6			55.3	22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	48	36	92	1512	1167	74
Shared Lane Traffic (%)						
Lane Group Flow (vph)	48	36	92	1512	1241	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15	9	15			9
Turn Type	Prot	pm+ov	Prot	NA	NA	
Protected Phases	4	5	5	2	6	
Permitted Phases		4				
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	10.0	10.0	
Minimum Split (s)	12.4	12.3	12.3	15.3	36.3	
Total Split (s)	14.0	18.0	18.0	76.0	58.0	
Total Split (%)	15.6%	20.0%	20.0%	84.4%	64.4%	
Maximum Green (s)	8.6	12.7	12.7	70.7	52.7	
Yellow Time (s)	3.0	3.0	3.0	3.8	3.8	
All-Red Time (s)	2.4	2.3	2.3	1.5	1.5	
Lost Time Adjust (s)	-0.4	-0.3	-0.3	-0.3	-0.3	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	
Recall Mode	None	None	None	Min	Min	

Liberty Classical Academy  
 2: Providence Road S & Lenny Stadler Way

04/07/2023

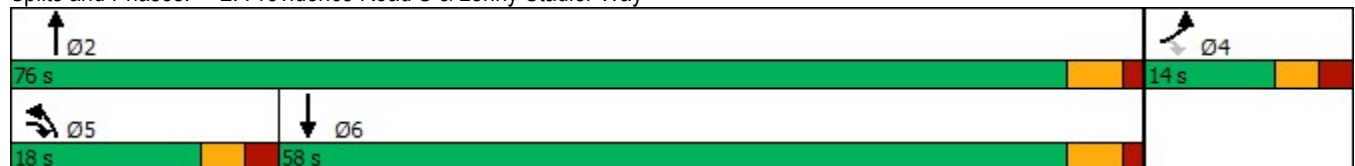


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Walk Time (s)					7.0	
Flash Dont Walk (s)					24.0	
Pedestrian Calls (#/hr)					0	
Act Effct Green (s)	8.4	15.5	9.0	43.4	31.7	
Actuated g/C Ratio	0.16	0.30	0.17	0.83	0.61	
v/c Ratio	0.17	0.08	0.30	0.52	0.59	
Control Delay	27.3	14.9	27.1	4.0	11.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	27.3	14.9	27.1	4.0	11.8	
LOS	C	B	C	A	B	
Approach Delay	22.0			5.3	11.8	
Approach LOS	C			A	B	
Queue Length 50th (ft)	14	8	28	110	170	
Queue Length 95th (ft)	50	30	79	167	279	
Internal Link Dist (ft)	979			2757	1061	
Turn Bay Length (ft)		50	325			
Base Capacity (vph)	333	624	481	3493	3166	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.14	0.06	0.19	0.43	0.39	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	52.3
Natural Cycle:	65
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.59
Intersection Signal Delay:	8.5
Intersection LOS:	A
Intersection Capacity Utilization:	55.3%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 2: Providence Road S & Lenny Stadler Way



Liberty Classical Academy  
3: Providence Road S & Rae Road

04/07/2023



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	380	214	388	1071	4	622	365
Future Volume (vph)	380	214	388	1071	4	622	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-2%			1%		-1%	
Storage Length (ft)	0	0	450		325		0
Storage Lanes	1	1	2		1		1
Taper Length (ft)	100		100		100		
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00	1.00
Fr <sub>t</sub>		0.850					0.850
Fl <sub>t</sub> Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1787	1599	3416	3522	1778	1872	1591
Fl <sub>t</sub> Permitted	0.950		0.950		0.237		
Satd. Flow (perm)	1787	1599	3416	3522	444	1872	1591
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	45			45		45	
Link Distance (ft)	1371			1071		2837	
Travel Time (s)	20.8			16.2		43.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	422	238	431	1190	4	691	406
Shared Lane Traffic (%)							
Lane Group Flow (vph)	422	238	431	1190	4	691	406
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	R NA	Left	Right
Median Width(ft)	12			24		24	
Link Offset(ft)	0			0		0	
Crosswalk Width(ft)	16			16		16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15	9	15		9		9
Turn Type	Prot	pm+ov	Prot	NA	Perm	NA	pm+ov
Protected Phases	4	5	5	2		6	4
Permitted Phases		4			6		6
Detector Phase	4	5	5	2	6	6	4
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	7.0
Minimum Split (s)	13.4	13.6	13.6	18.4	18.5	18.5	13.4
Total Split (s)	29.0	18.0	18.0	61.0	43.0	43.0	29.0
Total Split (%)	32.2%	20.0%	20.0%	67.8%	47.8%	47.8%	32.2%
Maximum Green (s)	22.6	11.4	11.4	54.6	36.5	36.5	22.6
Yellow Time (s)	4.7	3.0	3.0	4.4	4.6	4.6	4.7
All-Red Time (s)	1.7	3.6	3.6	2.0	1.9	1.9	1.7
Lost Time Adjust (s)	-1.4	-1.6	-1.6	-1.4	-1.5	-1.5	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	6.0	6.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0

Liberty Classical Academy  
 3: Providence Road S & Rae Road

04/07/2023

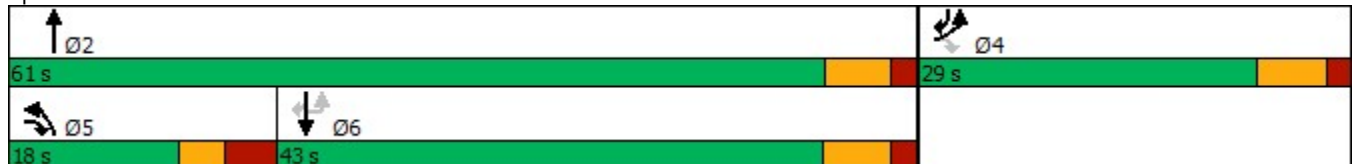


Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	30.0	30.0	30.0	0.0
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	22.8	40.9	13.0	52.9	34.8	34.8	62.7
Actuated g/C Ratio	0.27	0.48	0.15	0.62	0.41	0.41	0.73
v/c Ratio	0.89	0.31	0.83	0.55	0.02	0.91	0.35
Control Delay	53.8	16.0	51.9	10.8	15.8	42.0	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	16.0	51.9	10.8	15.8	42.0	5.0
LOS	D	B	D	B	B	D	A
Approach Delay	40.2			21.7		28.3	
Approach LOS	D			C		C	
Queue Length 50th (ft)	230	82	125	184	1	350	64
Queue Length 95th (ft)	#399	135	#206	236	8	#565	100
Internal Link Dist (ft)	1291			991		2757	
Turn Bay Length (ft)				450		325	
Base Capacity (vph)	503	763	521	2317	198	835	1188
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.31	0.83	0.51	0.02	0.83	0.34

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 85.8  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 27.4      Intersection LOS: C  
 Intersection Capacity Utilization 77.4%      ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Providence Road S & Rae Road





Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	427	776	8	6	11
Future Vol, veh/h	6	427	776	8	6	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	125	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	7	474	862	9	7	12

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	871	0	-	0	1350 862
Stage 1	-	-	-	-	862 -
Stage 2	-	-	-	-	488 -
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	774	-	-	-	166 355
Stage 1	-	-	-	-	414 -
Stage 2	-	-	-	-	617 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	774	-	-	-	165 355
Mov Cap-2 Maneuver	-	-	-	-	165 -
Stage 1	-	-	-	-	410 -
Stage 2	-	-	-	-	617 -

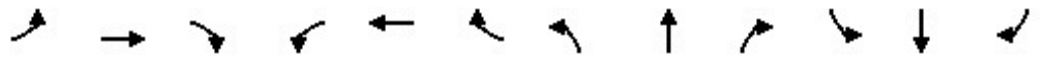
Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	20.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	774	-	-	-	252
HCM Lane V/C Ratio	0.009	-	-	-	0.075
HCM Control Delay (s)	9.7	-	-	-	20.4
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Weddington Classical Academy

1: Providence Road S & Church Parking Lot/Weddington Road

04/07/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↖	↖	↖	↖	↑↑	↖	↖↖	↖↖	↖↖
Traffic Volume (vph)	7	11	4	305	4	386	4	859	364	471	952	4
Future Volume (vph)	7	11	4	305	4	386	4	859	364	471	952	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			1%			-5%			5%	
Storage Length (ft)	0		0	550		325	550		450	450		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	0.95
Fr <sub>t</sub>		0.977				0.850			0.850		0.999	
Fl <sub>t</sub> Protected		0.984		0.950	0.953		0.950			0.950		
Satd. Flow (prot)	0	1836	0	1673	1678	1575	1814	3628	1623	3347	3447	0
Fl <sub>t</sub> Permitted		0.819		0.950	0.953		0.950			0.950		
Satd. Flow (perm)	0	1528	0	1673	1678	1575	1814	3628	1623	3347	3447	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		1005			826			1141			1010	
Travel Time (s)		27.4			16.1			22.2			19.7	
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)	8	12	4	339	4	429	4	954	404	523	1058	4
Shared Lane Traffic (%)				49%								
Lane Group Flow (vph)	0	24	0	173	170	429	4	954	404	523	1062	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.97	0.97	0.97	1.01	1.01	1.01	0.97	0.97	0.97	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases		4		3	3	1	5	2	3	1	6	
Permitted Phases	4					3			2			
Detector Phase	4	4		3	3	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	
Minimum Split (s)	13.7	13.7		13.6	13.6	13.4	13.4	19.1	13.6	13.4	17.6	
Total Split (s)	13.7	13.7		26.0	26.0	33.0	13.4	47.3	26.0	33.0	66.9	
Total Split (%)	11.4%	11.4%		21.7%	21.7%	27.5%	11.2%	39.4%	21.7%	27.5%	55.8%	
Maximum Green (s)	7.0	7.0		19.4	19.4	26.6	7.0	40.2	19.4	26.6	61.3	
Yellow Time (s)	3.5	3.5		3.8	3.8	3.0	3.1	5.0	3.8	3.0	4.1	
All-Red Time (s)	3.2	3.2		2.8	2.8	3.4	3.3	2.1	2.8	3.4	1.5	
Lost Time Adjust (s)		-1.7		-1.6	-1.6	-1.4	-1.4	-2.1	-1.6	-1.4	-0.6	
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	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	6.0	2.0	2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	

Weddington Classical Academy  
 1: Providence Road S & Church Parking Lot/Weddington Road

04/07/2023

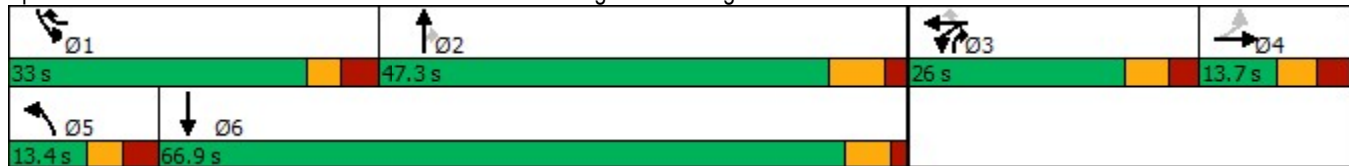


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	
Recall Mode	None	None		None	None	None	None	Min	None	None	Min	
Walk Time (s)	4.0	4.0					4.0	4.0			4.0	
Flash Dont Walk (s)	25.0	25.0					27.0	33.0			12.0	
Pedestrian Calls (#/hr)	0	0					0	0			0	
Act Effct Green (s)		9.5		15.8	15.8	40.9	9.1	31.6	52.9	21.2	56.2	
Actuated g/C Ratio		0.11		0.18	0.18	0.46	0.10	0.35	0.59	0.24	0.63	
v/c Ratio		0.15		0.58	0.57	0.59	0.02	0.74	0.42	0.66	0.49	
Control Delay		49.9		46.9	46.5	20.4	49.5	31.1	13.1	37.7	11.9	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		49.9		46.9	46.5	20.4	49.5	31.1	13.1	37.7	11.9	
LOS		D		D	D	C	D	C	B	D	B	
Approach Delay		49.9			32.1			25.8			20.4	
Approach LOS		D			C			C			C	
Queue Length 50th (ft)		12		90	89	150	2	229	100	129	116	
Queue Length 95th (ft)		47		212	207	275	15	418	248	251	360	
Internal Link Dist (ft)		925			746			1061			930	
Turn Bay Length (ft)				550		325	550		450	450		
Base Capacity (vph)		162		428	429	886	185	1871	1090	1142	2589	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.15		0.40	0.40	0.48	0.02	0.51	0.37	0.46	0.41	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 89.1  
 Natural Cycle: 80  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.74  
 Intersection Signal Delay: 25.0  
 Intersection LOS: C  
 Intersection Capacity Utilization 66.0%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 1: Providence Road S & Church Parking Lot/Weddington Road



Weddington Classical Academy  
2: Providence Road S & Lenny Stadler Way

04/07/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	42	26	48	1229	1212	48
Future Volume (vph)	42	26	48	1229	1212	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	1%			1%	1%	
Storage Length (ft)	0	50	325			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.994	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1761	1575	1761	3522	3500	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1761	1575	1761	3522	3500	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			35	35	
Link Distance (ft)	1059			2837	1141	
Travel Time (s)	20.6			55.3	22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	47	29	53	1366	1347	53
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	29	53	1366	1400	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15	9	15			9
Turn Type	Prot	pm+ov	Prot	NA	NA	
Protected Phases	4	5	5	2	6	
Permitted Phases		4				
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	10.0	10.0	
Minimum Split (s)	12.4	12.3	12.3	15.3	36.3	
Total Split (s)	14.0	14.0	14.0	76.0	62.0	
Total Split (%)	15.6%	15.6%	15.6%	84.4%	68.9%	
Maximum Green (s)	8.6	8.7	8.7	70.7	56.7	
Yellow Time (s)	3.0	3.0	3.0	3.8	3.8	
All-Red Time (s)	2.4	2.3	2.3	1.5	1.5	
Lost Time Adjust (s)	-0.4	-0.3	-0.3	-0.3	-0.3	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	
Recall Mode	None	None	None	Min	Min	

Weddington Classical Academy  
 2: Providence Road S & Lenny Stadler Way

04/07/2023

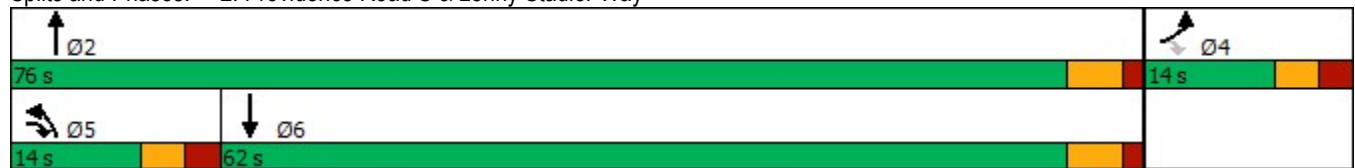


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Walk Time (s)					7.0	
Flash Dont Walk (s)					24.0	
Pedestrian Calls (#/hr)					0	
Act Effct Green (s)	8.5	14.8	8.5	44.6	38.3	
Actuated g/C Ratio	0.16	0.28	0.16	0.84	0.72	
v/c Ratio	0.17	0.07	0.19	0.46	0.56	
Control Delay	28.3	17.2	28.4	3.5	9.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	28.3	17.2	28.4	3.5	9.9	
LOS	C	B	C	A	A	
Approach Delay	24.0			4.4	9.9	
Approach LOS	C			A	A	
Queue Length 50th (ft)	15	7	17	93	202	
Queue Length 95th (ft)	51	28	55	141	305	
Internal Link Dist (ft)	979			2757	1061	
Turn Bay Length (ft)		50	325			
Base Capacity (vph)	333	484	333	3482	3232	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.14	0.06	0.16	0.39	0.43	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	53.3
Natural Cycle:	65
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.56
Intersection Signal Delay:	7.6
Intersection LOS:	A
Intersection Capacity Utilization:	54.1%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 2: Providence Road S & Lenny Stadler Way



Weddington Classical Academy  
3: Providence Road S & Rae Road

04/07/2023



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	490	318	226	768	4	853	355
Future Volume (vph)	490	318	226	768	4	853	355
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-2%			1%		-1%	
Storage Length (ft)	0	0	450		325		0
Storage Lanes	1	1	2		1		1
Taper Length (ft)	100		100		100		
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00	1.00
Frt		0.850					0.850
Flt Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1787	1599	3416	3522	1778	1872	1591
Flt Permitted	0.950		0.950		0.332		
Satd. Flow (perm)	1787	1599	3416	3522	622	1872	1591
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	45			45		45	
Link Distance (ft)	1371			1071		2837	
Travel Time (s)	20.8			16.2		43.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	544	353	251	853	4	948	394
Shared Lane Traffic (%)							
Lane Group Flow (vph)	544	353	251	853	4	948	394
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	R NA	Left	Right
Median Width(ft)	12			24		24	
Link Offset(ft)	0			0		0	
Crosswalk Width(ft)	16			16		16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15	9	15		9		9
Turn Type	Prot	pm+ov	Prot	NA	Perm	NA	pm+ov
Protected Phases	4	5	5	2		6	4
Permitted Phases		4			6		6
Detector Phase	4	5	5	2	6	6	4
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	7.0
Minimum Split (s)	13.4	13.6	13.6	18.4	18.5	18.5	13.4
Total Split (s)	40.6	14.6	14.6	79.4	64.8	64.8	40.6
Total Split (%)	33.8%	12.2%	12.2%	66.2%	54.0%	54.0%	33.8%
Maximum Green (s)	34.2	8.0	8.0	73.0	58.3	58.3	34.2
Yellow Time (s)	4.7	3.0	3.0	4.4	4.6	4.6	4.7
All-Red Time (s)	1.7	3.6	3.6	2.0	1.9	1.9	1.7
Lost Time Adjust (s)	-1.4	-1.6	-1.6	-1.4	-1.5	-1.5	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	6.0	6.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0

Weddington Classical Academy  
3: Providence Road S & Rae Road

04/07/2023

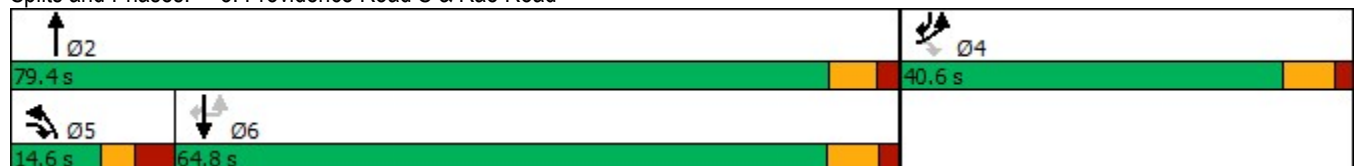


Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	30.0	30.0	30.0	0.0
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	35.6	50.2	9.6	74.4	59.8	59.8	100.4
Actuated g/C Ratio	0.30	0.42	0.08	0.62	0.50	0.50	0.84
v/c Ratio	1.03	0.53	0.92	0.39	0.01	1.02	0.30
Control Delay	87.9	29.6	92.2	12.1	15.5	64.4	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.9	29.6	92.2	12.1	15.5	64.4	2.7
LOS	F	C	F	B	B	E	A
Approach Delay	65.0			30.3		46.2	
Approach LOS	E			C		D	
Queue Length 50th (ft)	~450	201	101	163	2	~747	50
Queue Length 95th (ft)	#667	295	#181	203	8	#1026	72
Internal Link Dist (ft)	1291			991		2757	
Turn Bay Length (ft)				450		325	
Base Capacity (vph)	530	668	273	2183	309	932	1331
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.53	0.92	0.39	0.01	1.02	0.30

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Natural Cycle: 120  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.03  
 Intersection Signal Delay: 46.0      Intersection LOS: D  
 Intersection Capacity Utilization 91.0%      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: 3: Providence Road S & Rae Road



Weddington Classical Academy  
4: Weddington Road & Wheatberry Hill Drive

04/07/2023

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	687	571	11	12	11
Future Vol, veh/h	12	687	571	11	12	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	125	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	13	763	634	12	13	12

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	646	0	-	0	1423 634
Stage 1	-	-	-	-	634 -
Stage 2	-	-	-	-	789 -
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	939	-	-	-	150 479
Stage 1	-	-	-	-	529 -
Stage 2	-	-	-	-	448 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	939	-	-	-	148 479
Mov Cap-2 Maneuver	-	-	-	-	148 -
Stage 1	-	-	-	-	522 -
Stage 2	-	-	-	-	448 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	23.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	939	-	-	-	221
HCM Lane V/C Ratio	0.014	-	-	-	0.116
HCM Control Delay (s)	8.9	-	-	-	23.4
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.4



Intersection: 1: Providence Road S & Church Parking Lot/Weddington Road

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	T	R	L	L	T	TR
Maximum Queue (ft)	160	288	378	386	48	539	553	370	232	188	185	176
Average Queue (ft)	79	176	210	252	17	380	388	109	154	95	105	97
95th Queue (ft)	147	294	376	408	45	535	544	294	225	198	184	171
Link Distance (ft)	948		728			1069	1069				945	945
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		550		325	550			450	450	450		
Storage Blk Time (%)		0	0	8		0	5					
Queuing Penalty (veh)		0	2	38		0	12					

Intersection: 2: Providence Road S & Lenny Stadler Way

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	72	53	93	138	150	204	221
Average Queue (ft)	30	17	51	52	67	111	115
95th Queue (ft)	64	46	89	127	150	198	214
Link Distance (ft)	1007			2766	2766	1069	1069
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		50	325				
Storage Blk Time (%)	5	2					
Queuing Penalty (veh)	2	1					

Intersection: 3: Providence Road S & Rae Road

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	T	U	T	R
Maximum Queue (ft)	390	168	261	290	194	191	101	658	321
Average Queue (ft)	240	84	168	204	121	122	9	442	102
95th Queue (ft)	381	155	268	297	191	188	90	717	262
Link Distance (ft)	1322	1322			1034	1034		2766	2766
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			450	450			325		
Storage Blk Time (%)								29	
Queuing Penalty (veh)								1	

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Intersection: 4: Weddington Road & Wheatberry Hill Drive

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Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	27	44
Average Queue (ft)	4	17
95th Queue (ft)	20	45
Link Distance (ft)		956
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Network Summary

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Network wide Queuing Penalty: 55

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Intersection: 1: Providence Road S & Church Parking Lot/Weddington Road

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	T	R	L	L	T	TR
Maximum Queue (ft)	51	144	152	230	25	381	394	246	270	223	210	187
Average Queue (ft)	21	86	96	131	4	236	249	141	187	133	103	105
95th Queue (ft)	51	136	147	216	20	359	374	231	272	241	190	193
Link Distance (ft)	948		728			1069	1069				945	945
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		550		325	550			450	450	450		
Storage Blk Time (%)	0											
Queuing Penalty (veh)	0											

Intersection: 2: Providence Road S & Lenny Stadler Way

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	66	58	83	135	163	188	186
Average Queue (ft)	28	19	33	46	65	101	100
95th Queue (ft)	57	50	72	121	151	178	183
Link Distance (ft)	1007			2766	2766	1069	1069
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		50	325				
Storage Blk Time (%)	4	2					
Queuing Penalty (veh)	1	1					

Intersection: 3: Providence Road S & Rae Road

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	T	U	T	R
Maximum Queue (ft)	1119	826	232	251	220	183	184	1944	1690
Average Queue (ft)	770	368	164	194	122	114	18	1393	745
95th Queue (ft)	1370	1056	270	290	201	184	143	2222	1773
Link Distance (ft)	1322	1322			1034	1034		2766	2766
Upstream Blk Time (%)	8	4							
Queuing Penalty (veh)	0	0							
Storage Bay Dist (ft)			450	450			325		
Storage Blk Time (%)								53	
Queuing Penalty (veh)								2	

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Intersection: 4: Weddington Road & Wheatberry Hill Drive

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Movement	EB	B5	SB
Directions Served	L	T	LR
Maximum Queue (ft)	30	52	45
Average Queue (ft)	5	3	17
95th Queue (ft)	24	74	45
Link Distance (ft)		728	956
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	125		
Storage Blk Time (%)			
Queuing Penalty (veh)			

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Network Summary

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Network wide Queuing Penalty: 4

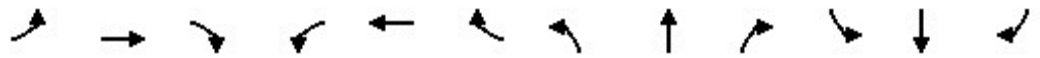
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## **2031 Background Traffic Volumes**

Liberty Classical Academy

1: Providence Road S & Church Parking Lot/Weddington Road

04/07/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙	↘	↗	↖	↑↑	↗	↖↖	↗↖	
Traffic Volume (vph)	55	30	4	448	18	479	19	1171	242	320	754	4
Future Volume (vph)	55	30	4	448	18	479	19	1171	242	320	754	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			1%			-5%			5%	
Storage Length (ft)	0		0	550		325	550		450	450		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	0.95
Frt		0.994				0.850			0.850		0.999	
Flt Protected		0.970		0.950	0.956		0.950			0.950		
Satd. Flow (prot)	0	1841	0	1673	1683	1575	1814	3628	1623	3347	3447	0
Flt Permitted		0.659		0.950	0.956		0.950			0.950		
Satd. Flow (perm)	0	1251	0	1673	1683	1575	1814	3628	1623	3347	3447	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		1005			826			1141			1010	
Travel Time (s)		27.4			16.1			22.2			19.7	
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)	61	33	4	498	20	532	21	1301	269	356	838	4
Shared Lane Traffic (%)				48%								
Lane Group Flow (vph)	0	98	0	259	259	532	21	1301	269	356	842	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.97	0.97	0.97	1.01	1.01	1.01	0.97	0.97	0.97	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases		4		3	3	1	5	2	3	1	6	
Permitted Phases	4					3			2			
Detector Phase	4	4		3	3	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	
Minimum Split (s)	13.7	13.7		13.6	13.6	13.4	13.4	19.1	13.6	13.4	17.6	
Total Split (s)	15.4	15.4		25.0	25.0	28.0	13.4	51.6	25.0	28.0	66.2	
Total Split (%)	12.8%	12.8%		20.8%	20.8%	23.3%	11.2%	43.0%	20.8%	23.3%	55.2%	
Maximum Green (s)	8.7	8.7		18.4	18.4	21.6	7.0	44.5	18.4	21.6	60.6	
Yellow Time (s)	3.5	3.5		3.8	3.8	3.0	3.1	5.0	3.8	3.0	4.1	
All-Red Time (s)	3.2	3.2		2.8	2.8	3.4	3.3	2.1	2.8	3.4	1.5	
Lost Time Adjust (s)		-1.7		-1.6	-1.6	-1.4	-1.4	-2.1	-1.6	-1.4	-0.6	
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	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	6.0	2.0	2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	
Recall Mode	None	None		None	None	None	None	Min	None	None	Min	
Walk Time (s)	4.0	4.0					4.0	4.0			4.0	
Flash Dont Walk (s)	25.0	25.0					27.0	33.0			12.0	
Pedestrian Calls (#/hr)	0	0					0	0			0	
Act Effct Green (s)		10.4		19.8	19.8	41.9	8.4	44.8	69.6	22.1	66.7	
Actuated g/C Ratio		0.09		0.17	0.17	0.36	0.07	0.38	0.59	0.19	0.57	
v/c Ratio		0.88		0.92	0.91	0.94	0.16	0.94	0.28	0.56	0.43	
Control Delay		113.2		85.4	84.1	54.4	55.7	48.7	12.6	47.4	16.1	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		113.2		85.4	84.1	54.4	55.7	48.7	12.6	47.4	16.1	
LOS		F		F	F	D	E	D	B	D	B	
Approach Delay		113.2			69.4			42.7			25.4	
Approach LOS		F			E			D			C	
Queue Length 50th (ft)		77		210	210	282	16	500	95	129	160	
Queue Length 95th (ft)		#183		#381	#380	#537	42	#643	144	179	268	
Internal Link Dist (ft)		925			746			1061			930	
Turn Bay Length (ft)				550		325	550		450	450		
Base Capacity (vph)		111		286	288	576	130	1446	967	658	1960	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.88		0.91	0.90	0.92	0.16	0.90	0.28	0.54	0.43	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 117.2

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 46.3

Intersection LOS: D

Intersection Capacity Utilization 80.4%

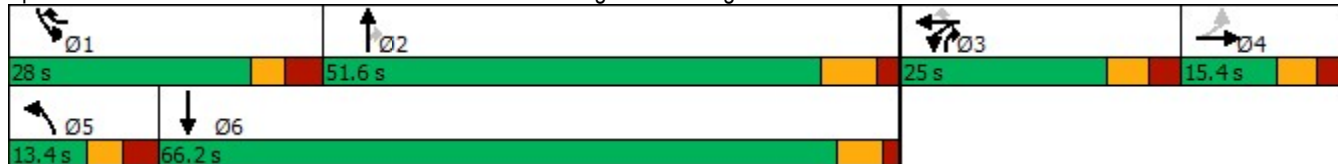
ICU Level of Service D

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Providence Road S & Church Parking Lot/Weddington Road



Liberty Classical Academy  
2: Providence Road S & Lenny Stadler Way

04/07/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	46	34	89	1466	1131	72
Future Volume (vph)	46	34	89	1466	1131	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	1%			1%	1%	
Storage Length (ft)	0	50	325			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Fr <sub>t</sub>		0.850			0.991	
Fl <sub>t</sub> Protected	0.950		0.950			
Satd. Flow (prot)	1761	1575	1761	3522	3490	0
Fl <sub>t</sub> Permitted	0.950		0.950			
Satd. Flow (perm)	1761	1575	1761	3522	3490	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			35	35	
Link Distance (ft)	1059			2837	1141	
Travel Time (s)	20.6			55.3	22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	51	38	99	1629	1257	80
Shared Lane Traffic (%)						
Lane Group Flow (vph)	51	38	99	1629	1337	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15	9	15			9
Turn Type	Prot	pm+ov	Prot	NA	NA	
Protected Phases	4	5	5	2	6	
Permitted Phases		4				
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	10.0	10.0	
Minimum Split (s)	12.4	12.3	12.3	15.3	36.3	
Total Split (s)	14.0	18.0	18.0	76.0	58.0	
Total Split (%)	15.6%	20.0%	20.0%	84.4%	64.4%	
Maximum Green (s)	8.6	12.7	12.7	70.7	52.7	
Yellow Time (s)	3.0	3.0	3.0	3.8	3.8	
All-Red Time (s)	2.4	2.3	2.3	1.5	1.5	
Lost Time Adjust (s)	-0.4	-0.3	-0.3	-0.3	-0.3	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	
Recall Mode	None	None	None	Min	Min	



Liberty Classical Academy  
 2: Providence Road S & Lenny Stadler Way

04/07/2023

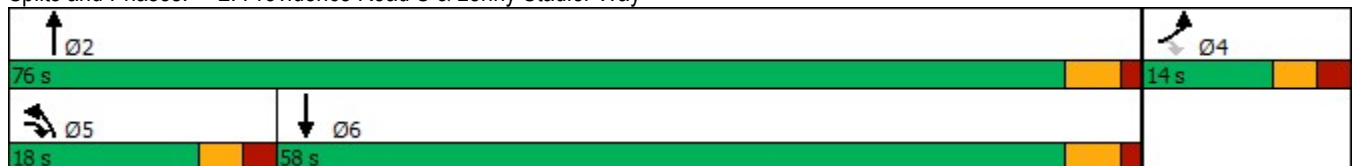


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Walk Time (s)					7.0	
Flash Dont Walk (s)					24.0	
Pedestrian Calls (#/hr)					0	
Act Effct Green (s)	8.6	15.9	9.5	46.4	34.1	
Actuated g/C Ratio	0.16	0.29	0.17	0.84	0.62	
v/c Ratio	0.19	0.08	0.33	0.55	0.62	
Control Delay	29.9	16.7	29.2	4.1	12.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	29.9	16.7	29.2	4.1	12.2	
LOS	C	B	C	A	B	
Approach Delay	24.2			5.5	12.2	
Approach LOS	C			A	B	
Queue Length 50th (ft)	16	9	32	126	194	
Queue Length 95th (ft)	57	33	90	188	318	
Internal Link Dist (ft)	979			2757	1061	
Turn Bay Length (ft)		50	325			
Base Capacity (vph)	323	599	466	3443	3046	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.16	0.06	0.21	0.47	0.44	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	55.2
Natural Cycle:	65
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.62
Intersection Signal Delay:	8.9
Intersection LOS:	A
Intersection Capacity Utilization:	57.7%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 2: Providence Road S & Lenny Stadler Way



Liberty Classical Academy  
3: Providence Road S & Rae Road

04/07/2023



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	409	230	418	1154	4	670	394
Future Volume (vph)	409	230	418	1154	4	670	394
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-2%			1%		-1%	
Storage Length (ft)	0	0	450		325		0
Storage Lanes	1	1	2		1		1
Taper Length (ft)	100		100		100		
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00	1.00
Fr <sub>t</sub>		0.850					0.850
Fl <sub>t</sub> Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1787	1599	3416	3522	1778	1872	1591
Fl <sub>t</sub> Permitted	0.950		0.950		0.216		
Satd. Flow (perm)	1787	1599	3416	3522	404	1872	1591
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	45			45		45	
Link Distance (ft)	1371			1071		2837	
Travel Time (s)	20.8			16.2		43.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	454	256	464	1282	4	744	438
Shared Lane Traffic (%)							
Lane Group Flow (vph)	454	256	464	1282	4	744	438
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	R NA	Left	Right
Median Width(ft)	12			24		24	
Link Offset(ft)	0			0		0	
Crosswalk Width(ft)	16			16		16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15	9	15		9		9
Turn Type	Prot	pm+ov	Prot	NA	Perm	NA	pm+ov
Protected Phases	4	5	5	2		6	4
Permitted Phases		4			6		6
Detector Phase	4	5	5	2	6	6	4
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	7.0
Minimum Split (s)	13.4	13.6	13.6	18.4	18.5	18.5	13.4
Total Split (s)	29.0	18.2	18.2	61.0	42.8	42.8	29.0
Total Split (%)	32.2%	20.2%	20.2%	67.8%	47.6%	47.6%	32.2%
Maximum Green (s)	22.6	11.6	11.6	54.6	36.3	36.3	22.6
Yellow Time (s)	4.7	3.0	3.0	4.4	4.6	4.6	4.7
All-Red Time (s)	1.7	3.6	3.6	2.0	1.9	1.9	1.7
Lost Time Adjust (s)	-1.4	-1.6	-1.6	-1.4	-1.5	-1.5	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	6.0	6.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0

Liberty Classical Academy  
 3: Providence Road S & Rae Road

04/07/2023

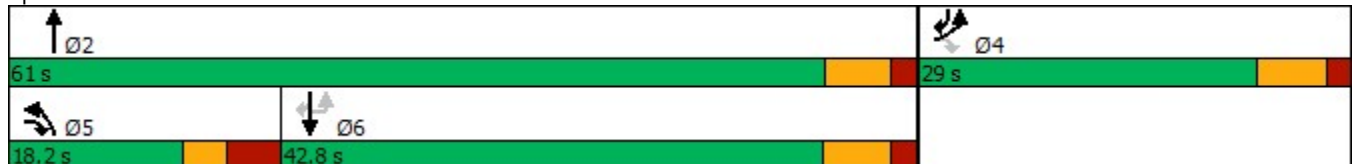


Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	30.0	30.0	30.0	0.0
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	23.9	42.1	13.2	55.2	37.0	37.0	65.9
Actuated g/C Ratio	0.27	0.47	0.15	0.62	0.42	0.42	0.74
v/c Ratio	0.95	0.34	0.92	0.59	0.02	0.96	0.37
Control Delay	64.2	16.6	63.0	11.5	16.0	50.3	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	16.6	63.0	11.5	16.0	50.3	5.2
LOS	E	B	E	B	B	D	A
Approach Delay	47.0			25.2		33.5	
Approach LOS	D			C		C	
Queue Length 50th (ft)	254	89	136	206	1	396	72
Queue Length 95th (ft)	#442	145	#226	264	8	#636	112
Internal Link Dist (ft)	1291			991		2757	
Turn Bay Length (ft)				450		325	
Base Capacity (vph)	481	755	506	2214	171	794	1178
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.34	0.92	0.58	0.02	0.94	0.37

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 89.1  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.96  
 Intersection Signal Delay: 32.2      Intersection LOS: C  
 Intersection Capacity Utilization 82.3%      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: 3: Providence Road S & Rae Road



Liberty Classical Academy  
4: Weddington Road & Wheatberry Hill Drive

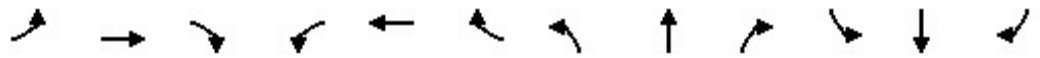
04/07/2023

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	459	836	9	6	12
Future Vol, veh/h	6	459	836	9	6	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	125	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	7	510	929	10	7	13
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	939	0	-	0	1453	929
Stage 1	-	-	-	-	929	-
Stage 2	-	-	-	-	524	-
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	730	-	-	-	144	324
Stage 1	-	-	-	-	385	-
Stage 2	-	-	-	-	594	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	730	-	-	-	143	324
Mov Cap-2 Maneuver	-	-	-	-	143	-
Stage 1	-	-	-	-	381	-
Stage 2	-	-	-	-	594	-
Approach	EB	WB	SB			
HCM Control Delay, s	0.1	0	22.3			
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	730	-	-	-	228	
HCM Lane V/C Ratio	0.009	-	-	-	0.088	
HCM Control Delay (s)	10	-	-	-	22.3	
HCM Lane LOS	A	-	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

Weddington Classical Academy

1: Providence Road S & Church Parking Lot/Weddington Road

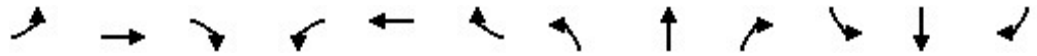
04/07/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙	↖	↗	↘	↑↑	↗	↖↖	↑↕	
Traffic Volume (vph)	7	12	4	329	4	415	4	925	392	507	1025	4
Future Volume (vph)	7	12	4	329	4	415	4	925	392	507	1025	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			1%			-5%			5%	
Storage Length (ft)	0		0	550		325	550		450	450		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	0.95
Frt		0.978				0.850			0.850		0.999	
Flt Protected		0.984		0.950	0.953		0.950			0.950		
Satd. Flow (prot)	0	1837	0	1673	1678	1575	1814	3628	1623	3347	3447	0
Flt Permitted		0.820		0.950	0.953		0.950			0.950		
Satd. Flow (perm)	0	1531	0	1673	1678	1575	1814	3628	1623	3347	3447	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		1005			826			1141			1010	
Travel Time (s)		27.4			16.1			22.2			19.7	
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)	8	13	4	366	4	461	4	1028	436	563	1139	4
Shared Lane Traffic (%)				49%								
Lane Group Flow (vph)	0	25	0	187	183	461	4	1028	436	563	1143	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.97	0.97	0.97	1.01	1.01	1.01	0.97	0.97	0.97	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases		4		3	3	1	5	2	3	1	6	
Permitted Phases	4					3			2			
Detector Phase	4	4		3	3	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	
Minimum Split (s)	13.7	13.7		13.6	13.6	13.4	13.4	19.1	13.6	13.4	17.6	
Total Split (s)	13.7	13.7		25.0	25.0	33.0	13.4	48.3	25.0	33.0	67.9	
Total Split (%)	11.4%	11.4%		20.8%	20.8%	27.5%	11.2%	40.3%	20.8%	27.5%	56.6%	
Maximum Green (s)	7.0	7.0		18.4	18.4	26.6	7.0	41.2	18.4	26.6	62.3	
Yellow Time (s)	3.5	3.5		3.8	3.8	3.0	3.1	5.0	3.8	3.0	4.1	
All-Red Time (s)	3.2	3.2		2.8	2.8	3.4	3.3	2.1	2.8	3.4	1.5	
Lost Time Adjust (s)		-1.7		-1.6	-1.6	-1.4	-1.4	-2.1	-1.6	-1.4	-0.6	
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	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	6.0	2.0	2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	

Weddington Classical Academy  
 1: Providence Road S & Church Parking Lot/Weddington Road

04/07/2023

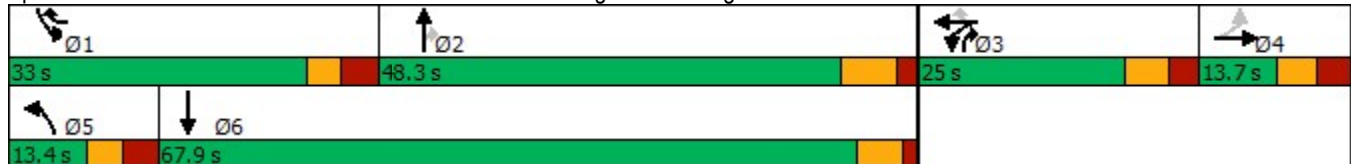


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	
Recall Mode	None	None		None	None	None	None	Min	None	None	Min	
Walk Time (s)	4.0	4.0					4.0	4.0			4.0	
Flash Dont Walk (s)	25.0	25.0					27.0	33.0			12.0	
Pedestrian Calls (#/hr)	0	0					0	0			0	
Act Effct Green (s)		9.4		16.4	16.4	42.1	9.1	34.1	56.0	22.8	60.2	
Actuated g/C Ratio		0.10		0.17	0.17	0.44	0.09	0.35	0.58	0.24	0.62	
v/c Ratio		0.17		0.66	0.64	0.67	0.02	0.80	0.46	0.71	0.53	
Control Delay		53.0		53.8	53.0	24.5	51.8	35.3	15.2	41.9	13.4	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		53.0		53.8	53.0	24.5	51.8	35.3	15.2	41.9	13.4	
LOS		D		D	D	C	D	D	B	D	B	
Approach Delay		53.0			37.4			29.4			22.8	
Approach LOS		D			D			C			C	
Queue Length 50th (ft)		17		130	127	185	3	346	177	188	225	
Queue Length 95th (ft)		48		#230	226	309	15	455	273	271	391	
Internal Link Dist (ft)		925			746			1061			930	
Turn Bay Length (ft)				550		325	550		450	450		
Base Capacity (vph)		148		374	375	809	170	1757	1028	1048	2497	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.17		0.50	0.49	0.57	0.02	0.59	0.42	0.54	0.46	

Intersection Summary

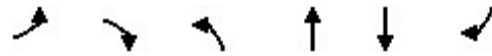
Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 96.4  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.80  
 Intersection Signal Delay: 28.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 69.6%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Providence Road S & Church Parking Lot/Weddington Road



Weddington Classical Academy  
2: Providence Road S & Lenny Stadler Way

04/07/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	45	28	51	1323	1305	51
Future Volume (vph)	45	28	51	1323	1305	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	1%			1%	1%	
Storage Length (ft)	0	50	325			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.994	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1761	1575	1761	3522	3500	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1761	1575	1761	3522	3500	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			35	35	
Link Distance (ft)	1059			2837	1141	
Travel Time (s)	20.6			55.3	22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	50	31	57	1470	1450	57
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	31	57	1470	1507	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15	9	15			9
Turn Type	Prot	pm+ov	Prot	NA	NA	
Protected Phases	4	5	5	2	6	
Permitted Phases		4				
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	10.0	10.0	
Minimum Split (s)	12.4	12.3	12.3	15.3	36.3	
Total Split (s)	13.0	13.0	13.0	77.0	64.0	
Total Split (%)	14.4%	14.4%	14.4%	85.6%	71.1%	
Maximum Green (s)	7.6	7.7	7.7	71.7	58.7	
Yellow Time (s)	3.0	3.0	3.0	3.8	3.8	
All-Red Time (s)	2.4	2.3	2.3	1.5	1.5	
Lost Time Adjust (s)	-0.4	-0.3	-0.3	-0.3	-0.3	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	
Recall Mode	None	None	None	Min	Min	

Weddington Classical Academy  
 2: Providence Road S & Lenny Stadler Way

04/07/2023

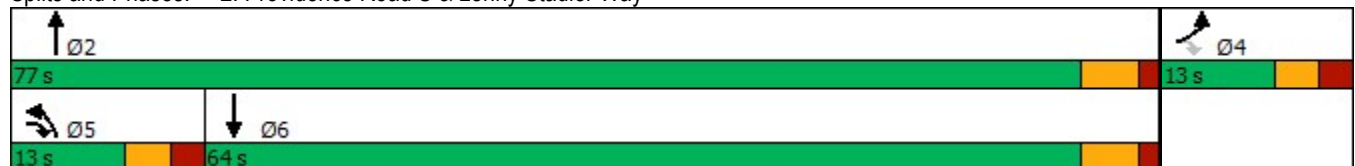


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Walk Time (s)					7.0	
Flash Dont Walk (s)					24.0	
Pedestrian Calls (#/hr)					0	
Act Effct Green (s)	8.5	14.6	8.4	47.0	40.8	
Actuated g/C Ratio	0.15	0.26	0.15	0.85	0.73	
v/c Ratio	0.19	0.08	0.21	0.49	0.59	
Control Delay	30.3	19.1	30.5	3.5	9.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	30.3	19.1	30.5	3.5	9.8	
LOS	C	B	C	A	A	
Approach Delay	26.0			4.5	9.8	
Approach LOS	C			A	A	
Queue Length 50th (ft)	17	8	20	105	229	
Queue Length 95th (ft)	54	31	61	146	320	
Internal Link Dist (ft)	979			2757	1061	
Turn Bay Length (ft)		50	325			
Base Capacity (vph)	285	429	285	3475	3206	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.18	0.07	0.20	0.42	0.47	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	55.6
Natural Cycle:	65
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.59
Intersection Signal Delay:	7.6
Intersection LOS:	A
Intersection Capacity Utilization:	56.5%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 2: Providence Road S & Lenny Stadler Way





Weddington Classical Academy  
3: Providence Road S & Rae Road

04/07/2023



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	528	342	244	827	4	919	383
Future Volume (vph)	528	342	244	827	4	919	383
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-2%			1%		-1%	
Storage Length (ft)	0	0	450		325		0
Storage Lanes	1	1	2		1		1
Taper Length (ft)	100		100		100		
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00	1.00
Frt		0.850					0.850
Flt Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1787	1599	3416	3522	1778	1872	1591
Flt Permitted	0.950		0.950		0.311		
Satd. Flow (perm)	1787	1599	3416	3522	582	1872	1591
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	45			45		45	
Link Distance (ft)	1371			1071		2837	
Travel Time (s)	20.8			16.2		43.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	587	380	271	919	4	1021	426
Shared Lane Traffic (%)							
Lane Group Flow (vph)	587	380	271	919	4	1021	426
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	R NA	Left	Right
Median Width(ft)	12			24		24	
Link Offset(ft)	0			0		0	
Crosswalk Width(ft)	16			16		16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15	9	15		9		9
Turn Type	Prot	pm+ov	Prot	NA	Perm	NA	pm+ov
Protected Phases	4	5	5	2		6	4
Permitted Phases		4			6		6
Detector Phase	4	5	5	2	6	6	4
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	7.0
Minimum Split (s)	13.4	13.6	13.6	18.4	18.5	18.5	13.4
Total Split (s)	40.0	14.0	14.0	80.0	66.0	66.0	40.0
Total Split (%)	33.3%	11.7%	11.7%	66.7%	55.0%	55.0%	33.3%
Maximum Green (s)	33.6	7.4	7.4	73.6	59.5	59.5	33.6
Yellow Time (s)	4.7	3.0	3.0	4.4	4.6	4.6	4.7
All-Red Time (s)	1.7	3.6	3.6	2.0	1.9	1.9	1.7
Lost Time Adjust (s)	-1.4	-1.6	-1.6	-1.4	-1.5	-1.5	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	6.0	6.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0

Weddington Classical Academy  
3: Providence Road S & Rae Road

04/07/2023

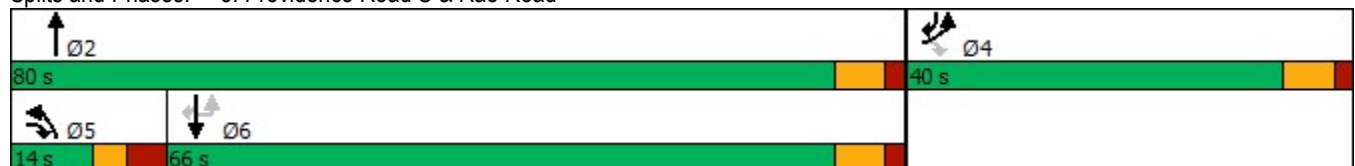


Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	30.0	30.0	30.0	0.0
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	35.0	49.0	9.0	75.0	61.0	61.0	101.0
Actuated g/C Ratio	0.29	0.41	0.08	0.62	0.51	0.51	0.84
v/c Ratio	1.13	0.58	1.06	0.42	0.01	1.07	0.32
Control Delay	118.7	32.0	125.3	12.1	15.0	80.7	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	118.7	32.0	125.3	12.1	15.0	80.7	2.7
LOS	F	C	F	B	B	F	A
Approach Delay	84.7			37.9		57.6	
Approach LOS	F			D		E	
Queue Length 50th (ft)	~526	225	~118	177	2	~879	53
Queue Length 95th (ft)	#749	329	#206	220	8	#1132	76
Internal Link Dist (ft)	1291			991		2757	
Turn Bay Length (ft)			450		325		
Base Capacity (vph)	521	652	256	2201	295	951	1339
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.58	1.06	0.42	0.01	1.07	0.32

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Natural Cycle: 120  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.13  
 Intersection Signal Delay: 58.4  
 Intersection LOS: E  
 Intersection Capacity Utilization 97.1%  
 ICU Level of Service F  
 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: 3: Providence Road S & Rae Road



Weddington Classical Academy  
 4: Weddington Road & Wheatberry Hill Drive

04/07/2023

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	740	615	12	13	12
Future Vol, veh/h	13	740	615	12	13	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	125	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	14	822	683	13	14	13

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	696	0	-	0	1533 683
Stage 1	-	-	-	-	683 -
Stage 2	-	-	-	-	850 -
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	900	-	-	-	128 449
Stage 1	-	-	-	-	502 -
Stage 2	-	-	-	-	419 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	900	-	-	-	126 449
Mov Cap-2 Maneuver	-	-	-	-	126 -
Stage 1	-	-	-	-	494 -
Stage 2	-	-	-	-	419 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	26.9
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	900	-	-	-	192
HCM Lane V/C Ratio	0.016	-	-	-	0.145
HCM Control Delay (s)	9.1	-	-	-	26.9
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	0.5

Intersection: 1: Providence Road S & Church Parking Lot/Weddington Road

Movement	EB	WB	WB	WB	B5	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LT	R	T	L	T	T	R	L	L	T
Maximum Queue (ft)	148	528	634	423	84	176	641	655	512	256	222	204
Average Queue (ft)	84	293	351	318	14	34	478	493	210	171	125	122
95th Queue (ft)	143	593	724	475	86	182	680	707	551	246	227	203
Link Distance (ft)	948		728		872		1069	1069				945
Upstream Blk Time (%)			5									
Queuing Penalty (veh)			45									
Storage Bay Dist (ft)		550		325		550			450	450	450	
Storage Blk Time (%)		0	5	23			5	18				
Queuing Penalty (veh)		2	42	118			1	48				

Intersection: 1: Providence Road S & Church Parking Lot/Weddington Road

Movement	SB
Directions Served	TR
Maximum Queue (ft)	197
Average Queue (ft)	117
95th Queue (ft)	191
Link Distance (ft)	945
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Providence Road S & Lenny Stadler Way

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	70	46	104	146	163	250	258
Average Queue (ft)	30	19	56	56	78	121	125
95th Queue (ft)	64	45	98	130	160	231	240
Link Distance (ft)	1007			2766	2766	1069	1069
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		50	325				
Storage Blk Time (%)	5	2					
Queuing Penalty (veh)	2	1					

Intersection: 3: Providence Road S & Rae Road

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	T	U	T	R
Maximum Queue (ft)	560	172	309	346	213	236	186	887	512
Average Queue (ft)	363	84	222	261	130	142	14	605	156
95th Queue (ft)	605	158	315	356	205	223	127	970	451
Link Distance (ft)	1322	1322			1034	1034		2766	2766
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			450	450			325		
Storage Blk Time (%)								46	
Queuing Penalty (veh)								2	

Intersection: 4: Weddington Road & Wheatberry Hill Drive

Movement	EB	B5	SB
Directions Served	L	T	LR
Maximum Queue (ft)	20	76	33
Average Queue (ft)	3	5	13
95th Queue (ft)	17	108	39
Link Distance (ft)		728	956
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	125		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 259
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Intersection: 1: Providence Road S & Church Parking Lot/Weddington Road

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	T	R	L	L	T	TR
Maximum Queue (ft)	69	182	192	293	26	386	387	277	277	222	206	194
Average Queue (ft)	25	106	111	173	4	245	258	146	197	150	108	107
95th Queue (ft)	59	174	185	273	19	373	386	261	278	240	201	191
Link Distance (ft)	948		728			1069	1069				945	945
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		550		325	550			450	450	450		
Storage Blk Time (%)				0			0					
Queuing Penalty (veh)				1			0					

Intersection: 2: Providence Road S & Lenny Stadler Way

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	63	52	86	125	156	227	218
Average Queue (ft)	30	16	33	42	63	109	104
95th Queue (ft)	60	45	73	106	143	204	202
Link Distance (ft)	1007			2766	2766	1069	1069
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		50	325				
Storage Blk Time (%)	5	2					
Queuing Penalty (veh)	2	1					

Intersection: 3: Providence Road S & Rae Road

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	T	U	T	R
Maximum Queue (ft)	1338	1282	358	394	337	327	184	2579	2511
Average Queue (ft)	1134	797	243	276	145	140	19	1785	1247
95th Queue (ft)	1599	1726	387	424	350	316	156	2812	2588
Link Distance (ft)	1322	1322			1034	1034		2766	2766
Upstream Blk Time (%)	40	30			0			0	0
Queuing Penalty (veh)	0	0			0			3	0
Storage Bay Dist (ft)			450	450			325		
Storage Blk Time (%)			0	4	0			52	
Queuing Penalty (veh)			1	16	0			2	

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Intersection: 4: Weddington Road & Wheatberry Hill Drive

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Movement	EB	B5	SB
Directions Served	L	T	LR
Maximum Queue (ft)	31	77	40
Average Queue (ft)	7	5	20
95th Queue (ft)	28	109	46
Link Distance (ft)		728	956
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)	125		
Storage Blk Time (%)			
Queuing Penalty (veh)			

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Network Summary

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Network wide Queuing Penalty: 25

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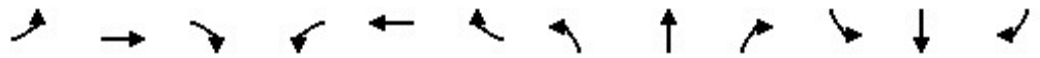
## **2026 Build Traffic Volumes**



Liberty Classical Academy

1: Providence Road S & Church Parking Lot/Weddington Road

04/07/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙	↘	↗	↖	↕	↗	↖	↕	↖
Traffic Volume (vph)	48	27	4	486	16	547	17	1035	331	478	706	4
Future Volume (vph)	48	27	4	486	16	547	17	1035	331	478	706	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			1%			-5%			5%	
Storage Length (ft)	0		0	550		325	550		450	450		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	0.95
Fr <sub>t</sub>		0.994				0.850			0.850		0.999	
Fl <sub>t</sub> Protected		0.970		0.950	0.955		0.950			0.950		
Satd. Flow (prot)	0	1841	0	1673	1682	1575	1814	3628	1623	3347	3447	0
Fl <sub>t</sub> Permitted		0.640		0.950	0.955		0.950			0.950		
Satd. Flow (perm)	0	1215	0	1673	1682	1575	1814	3628	1623	3347	3447	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		1005			826			1141			1010	
Travel Time (s)		27.4			16.1			22.2			19.7	
Peak Hour Factor	0.90	0.90	0.90	0.83	0.90	0.81	0.90	0.90	0.76	0.74	0.88	0.90
Adj. Flow (vph)	53	30	4	586	18	675	19	1150	436	646	802	4
Shared Lane Traffic (%)				49%								
Lane Group Flow (vph)	0	87	0	299	305	675	19	1150	436	646	806	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.97	0.97	0.97	1.01	1.01	1.01	0.97	0.97	0.97	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases		4		3	3	1	5	2	3	1	6	
Permitted Phases	4					3			2			
Detector Phase	4	4		3	3	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	
Minimum Split (s)	13.7	13.7		13.6	13.6	13.4	13.4	19.1	13.6	13.4	17.6	
Total Split (s)	14.2	14.2		27.0	27.0	33.3	13.4	45.5	27.0	33.3	65.4	
Total Split (%)	11.8%	11.8%		22.5%	22.5%	27.8%	11.2%	37.9%	22.5%	27.8%	54.5%	
Maximum Green (s)	7.5	7.5		20.4	20.4	26.9	7.0	38.4	20.4	26.9	59.8	
Yellow Time (s)	3.5	3.5		3.8	3.8	3.0	3.1	5.0	3.8	3.0	4.1	
All-Red Time (s)	3.2	3.2		2.8	2.8	3.4	3.3	2.1	2.8	3.4	1.5	
Lost Time Adjust (s)		-1.7		-1.6	-1.6	-1.4	-1.4	-2.1	-1.6	-1.4	-0.6	
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	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	6.0	2.0	2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	

Liberty Classical Academy  
 1: Providence Road S & Church Parking Lot/Weddington Road

04/07/2023

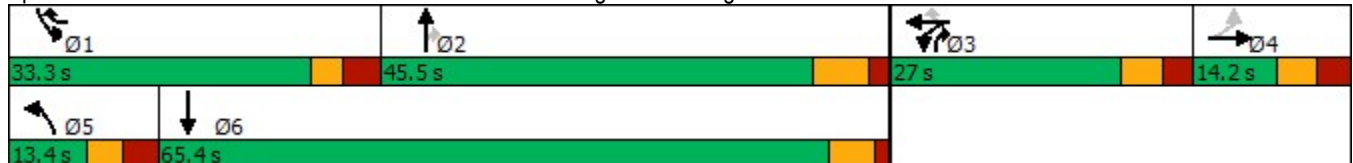


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	
Recall Mode	None	None		None	None	None	None	Min	None	None	Min	
Walk Time (s)	4.0	4.0					4.0	4.0			4.0	
Flash Dont Walk (s)	25.0	25.0					27.0	33.0			12.0	
Pedestrian Calls (#/hr)	0	0					0	0			0	
Act Effct Green (s)		9.2		22.0	22.0	50.3	8.4	39.7	66.7	28.3	67.7	
Actuated g/C Ratio		0.08		0.18	0.18	0.42	0.07	0.33	0.56	0.24	0.57	
v/c Ratio		0.93		0.97	0.98	1.02	0.15	0.95	0.48	0.81	0.41	
Control Delay		130.9		93.4	96.3	66.0	55.4	55.8	18.0	52.5	16.3	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		130.9		93.4	96.3	66.0	55.4	55.8	18.0	52.5	16.3	
LOS		F		F	F	E	E	E	B	D	B	
Approach Delay		130.9			79.6			45.5			32.4	
Approach LOS		F			E			D			C	
Queue Length 50th (ft)		68		245	250	~384	14	452	192	245	154	
Queue Length 95th (ft)		#173		#381	#444	#532	39	#592	216	246	251	
Internal Link Dist (ft)		925			746			1061			930	
Turn Bay Length (ft)				550		325	550		450	450		
Base Capacity (vph)		94		308	310	664	127	1232	907	794	1956	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.93		0.97	0.98	1.02	0.15	0.93	0.48	0.81	0.41	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 119.2  
 Natural Cycle: 120  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.02  
 Intersection Signal Delay: 52.7  
 Intersection LOS: D  
 Intersection Capacity Utilization 80.8%  
 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: 1: Providence Road S & Church Parking Lot/Weddington Road



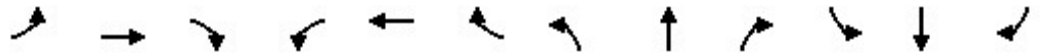
Liberty Classical Academy

2: Providence Road S & Lenny Stadler Way/Site Access 1

04/07/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↕			↖	↗
Traffic Volume (vph)	41	4	30	4	4	4	79	1412	23	55	1073	64
Future Volume (vph)	41	4	30	4	4	4	79	1412	23	55	1073	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			1%			1%	
Storage Length (ft)	0		50	0		425	325		0	0		0
Storage Lanes	0		1	0		1	1		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95
Frt			0.850			0.850		0.996			0.992	
Flt Protected		0.959			0.976		0.950				0.996	
Satd. Flow (prot)	0	1777	1575	0	1818	1583	1761	3507	0	0	3479	0
Flt Permitted		0.746			0.814		0.142				0.634	
Satd. Flow (perm)	0	1383	1575	0	1516	1583	263	3507	0	0	2215	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			10			35			35	
Link Distance (ft)		1059			530			2837			1141	
Travel Time (s)		20.6			36.1			55.3			22.2	
Peak Hour Factor	0.90	0.50	0.90	0.50	0.50	0.50	0.90	0.87	0.50	0.50	0.87	0.90
Adj. Flow (vph)	46	8	33	8	8	8	88	1623	46	110	1233	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	54	33	0	16	8	88	1669	0	0	1414	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	D.P+P	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8		8	6			6		
Detector Phase	4	4	5	8	8	8	5	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	10.0		10.0	10.0	
Minimum Split (s)	12.4	12.4	12.3	20.0	20.0	20.0	12.3	15.3		36.3	36.3	
Total Split (s)	20.0	20.0	12.3	20.0	20.0	20.0	12.3	70.0		57.7	57.7	
Total Split (%)	22.2%	22.2%	13.7%	22.2%	22.2%	22.2%	13.7%	77.8%		64.1%	64.1%	
Maximum Green (s)	14.6	14.6	7.0	13.0	13.0	13.0	7.0	64.7		52.4	52.4	
Yellow Time (s)	3.0	3.0	3.0	5.0	5.0	5.0	3.0	3.8		3.8	3.8	
All-Red Time (s)	2.4	2.4	2.3	2.0	2.0	2.0	2.3	1.5		1.5	1.5	
Lost Time Adjust (s)		-2.0	-0.3		-2.0	-2.0	-0.3	-0.3			-0.3	
Total Lost Time (s)		3.4	5.0		5.0	5.0	5.0	5.0			5.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Min		Min	Min	



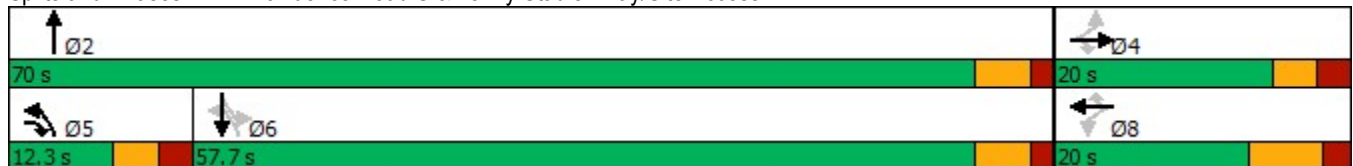
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										24.0	24.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		10.5	15.8		9.6	9.6	63.2	69.3				58.6
Actuated g/C Ratio		0.13	0.20		0.12	0.12	0.78	0.86				0.73
v/c Ratio		0.30	0.11		0.09	0.04	0.26	0.55				0.88
Control Delay		37.7	25.1		34.8	33.8	4.4	4.1				22.2
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0				0.0
Total Delay		37.7	25.1		34.8	33.8	4.4	4.1				22.2
LOS		D	C		C	C	A	A				C
Approach Delay		32.9			34.4			4.1				22.2
Approach LOS		C			C			A				C
Queue Length 50th (ft)		26	13		8	4	8	151				~380
Queue Length 95th (ft)		32	35		14	9	20	216				#544
Internal Link Dist (ft)		979			450			2757				1061
Turn Bay Length (ft)			50			425	325					
Base Capacity (vph)		286	309		283	295	342	3013				1609
Starvation Cap Reductn		0	0		0	0	0	0				0
Spillback Cap Reductn		0	0		0	0	0	0				0
Storage Cap Reductn		0	0		0	0	0	0				0
Reduced v/c Ratio		0.19	0.11		0.06	0.03	0.26	0.55				0.88

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 80.6  
 Natural Cycle: 110  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.88  
 Intersection Signal Delay: 12.9  
 Intersection Capacity Utilization 89.3%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service E

~ 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: 2: Providence Road S & Lenny Stadler Way/Site Access 1



Liberty Classical Academy  
3: Providence Road S & Rae Road

04/07/2023



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	455	204	369	1067	4	617	397
Future Volume (vph)	455	204	369	1067	4	617	397
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-2%			1%		-1%	
Storage Length (ft)	0	0	450		325		0
Storage Lanes	1	1	2		1		1
Taper Length (ft)	100		100		100		
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00	1.00
Fr <sub>t</sub>		0.850					0.850
Fl <sub>t</sub> Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1787	1599	3416	3522	1778	1872	1591
Fl <sub>t</sub> Permitted	0.950		0.950		0.232		
Satd. Flow (perm)	1787	1599	3416	3522	434	1872	1591
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	45			45		45	
Link Distance (ft)	1371			1071		2837	
Travel Time (s)	20.8			16.2		43.0	
Peak Hour Factor	0.82	0.90	0.90	0.88	0.90	0.88	0.85
Adj. Flow (vph)	555	227	410	1213	4	701	467
Shared Lane Traffic (%)							
Lane Group Flow (vph)	555	227	410	1213	4	701	467
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	R NA	Left	Right
Median Width(ft)	12			24		24	
Link Offset(ft)	0			0		0	
Crosswalk Width(ft)	16			16		16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15	9	15		9		9
Turn Type	Prot	pm+ov	Prot	NA	Perm	NA	pm+ov
Protected Phases	4	5	5	2		6	4
Permitted Phases		4			6		6
Detector Phase	4	5	5	2	6	6	4
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	7.0
Minimum Split (s)	13.4	13.6	13.6	18.4	18.5	18.5	13.4
Total Split (s)	33.0	16.3	16.3	57.0	40.7	40.7	33.0
Total Split (%)	36.7%	18.1%	18.1%	63.3%	45.2%	45.2%	36.7%
Maximum Green (s)	26.6	9.7	9.7	50.6	34.2	34.2	26.6
Yellow Time (s)	4.7	3.0	3.0	4.4	4.6	4.6	4.7
All-Red Time (s)	1.7	3.6	3.6	2.0	1.9	1.9	1.7
Lost Time Adjust (s)	-1.4	-1.6	-1.6	-1.4	-1.5	-1.5	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	6.0	6.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0

Liberty Classical Academy  
 3: Providence Road S & Rae Road

04/07/2023

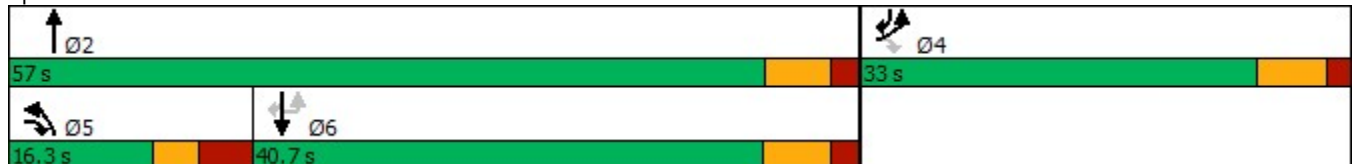


Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	30.0	30.0	30.0	0.0
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	28.0	44.3	11.3	51.3	35.0	35.0	68.0
Actuated g/C Ratio	0.31	0.50	0.13	0.57	0.39	0.39	0.76
v/c Ratio	0.99	0.29	0.95	0.60	0.02	0.96	0.39
Control Delay	68.7	14.6	73.0	13.9	17.2	52.1	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.7	14.6	73.0	13.9	17.2	52.1	4.6
LOS	E	B	E	B	B	D	A
Approach Delay	53.0			28.8		33.1	
Approach LOS	D			C		C	
Queue Length 50th (ft)	313	73	121	216	1	376	71
Queue Length 95th (ft)	#452	122	#212	267	8	#583	99
Internal Link Dist (ft)	1291			991		2757	
Turn Bay Length (ft)				450		325	
Base Capacity (vph)	560	793	432	2051	173	748	1211
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.29	0.95	0.59	0.02	0.94	0.39

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 89.3  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 35.5      Intersection LOS: D  
 Intersection Capacity Utilization 80.7%      ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Providence Road S & Rae Road



**Intersection**

Int Delay, s/veh 1513.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	406	312	77	755	8	198	4	49	5	4	11
Future Vol, veh/h	5	406	312	77	755	8	198	4	49	5	4	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	125	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	50	50	89	90	50	50	50	90	50	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	451	624	154	848	9	396	8	98	6	8	12

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	857	0	0	1075
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	783	-	-	649
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	783	-	-	649
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.9	\$ 7885.2	212.2
HCM LOS			F	F

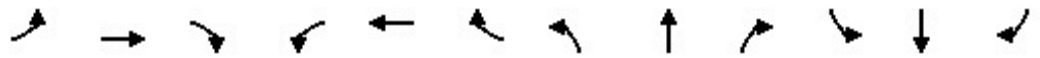
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	28	783	-	-	649	-	-	38
HCM Lane V/C Ratio	17.929	0.007	-	-	0.237	-	-	0.678
HCM Control Delay (s)	\$ 7885.2	9.6	-	-	12.3	0	-	212.2
HCM Lane LOS	F	A	-	-	B	A	-	F
HCM 95th %tile Q(veh)	62.3	0	-	-	0.9	-	-	2.4

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

Liberty Classical Academy

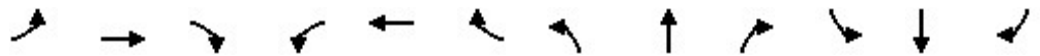
1: Providence Road S & Church Parking Lot/Weddington Road

04/26/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙	↘	↗	↖	↑↑	↗	↖↖	↗↖	
Traffic Volume (vph)	6	11	4	402	4	551	4	856	421	544	906	4
Future Volume (vph)	6	11	4	402	4	551	4	856	421	544	906	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			1%			-5%			5%	
Storage Length (ft)	0		0	550		325	550		450	450		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	0.95
Frt		0.977				0.850			0.850		0.999	
Flt Protected		0.985		0.950	0.953		0.950			0.950		
Satd. Flow (prot)	0	1837	0	1673	1678	1575	1814	3628	1623	3347	3447	0
Flt Permitted		0.798		0.950	0.953		0.950			0.950		
Satd. Flow (perm)	0	1489	0	1673	1678	1575	1814	3628	1623	3347	3447	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		1005			826			1141			1010	
Travel Time (s)		27.4			16.1			22.2			19.7	
Peak Hour Factor	0.90	0.90	0.90	0.79	0.90	0.77	0.90	0.88	0.83	0.83	0.90	0.90
Adj. Flow (vph)	7	12	4	509	4	716	4	973	507	655	1007	4
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	23	0	254	259	716	4	973	507	655	1011	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.97	0.97	0.97	1.01	1.01	1.01	0.97	0.97	0.97	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases		4		3	3	1	5	2	3	1	6	
Permitted Phases	4					3			2			
Detector Phase	4	4		3	3	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	
Minimum Split (s)	13.7	13.7		13.6	13.6	13.4	13.4	19.1	13.6	13.4	17.6	
Total Split (s)	13.7	13.7		25.0	25.0	40.4	13.4	40.9	25.0	40.4	67.9	
Total Split (%)	11.4%	11.4%		20.8%	20.8%	33.7%	11.2%	34.1%	20.8%	33.7%	56.6%	
Maximum Green (s)	7.0	7.0		18.4	18.4	34.0	7.0	33.8	18.4	34.0	62.3	
Yellow Time (s)	3.5	3.5		3.8	3.8	3.0	3.1	5.0	3.8	3.0	4.1	
All-Red Time (s)	3.2	3.2		2.8	2.8	3.4	3.3	2.1	2.8	3.4	1.5	
Lost Time Adjust (s)		-1.7		-1.6	-1.6	-1.4	-1.4	-2.1	-1.6	-1.4	-0.6	
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	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	6.0	2.0	2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	
Recall Mode	None	None		None	None	None	None	Min	None	None	Min	
Walk Time (s)	4.0	4.0					4.0	4.0			4.0	
Flash Dont Walk (s)	25.0	25.0					27.0	33.0			12.0	
Pedestrian Calls (#/hr)	0	0					0	0			0	
Act Effct Green (s)		8.9		19.8	19.8	56.3	8.5	32.8	57.7	34.1	69.6	
Actuated g/C Ratio		0.08		0.18	0.18	0.51	0.08	0.30	0.53	0.31	0.64	
v/c Ratio		0.19		0.84	0.85	0.89	0.03	0.90	0.59	0.63	0.46	
Control Delay		56.0		70.2	71.8	37.2	52.8	49.3	22.7	36.9	12.7	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		56.0		70.2	71.8	37.2	52.8	49.3	22.7	36.9	12.7	
LOS		E		E	E	D	D	D	C	D	B	
Approach Delay		56.0			51.3			40.2			22.2	
Approach LOS		E			D			D			C	
Queue Length 50th (ft)		17		205	210	364	3	379	272	229	197	
Queue Length 95th (ft)		45		#295	#380	#398	15	#464	341	264	330	
Internal Link Dist (ft)		925			746			1061			930	
Turn Bay Length (ft)				550		325	550		450	450		
Base Capacity (vph)		120		310	311	837	141	1210	863	1101	2226	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.19		0.82	0.83	0.86	0.03	0.80	0.59	0.59	0.45	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 109.5

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 36.6

Intersection LOS: D

Intersection Capacity Utilization 76.1%

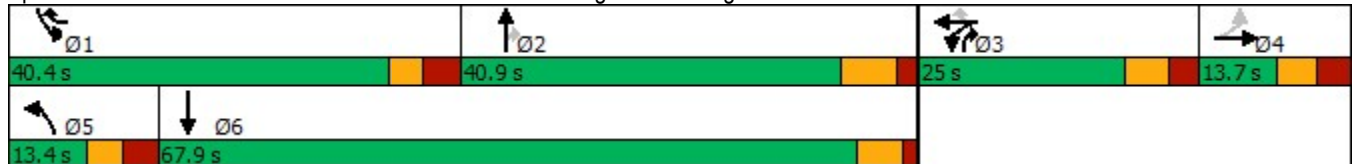
ICU Level of Service D

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

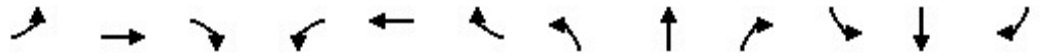
Splits and Phases: 1: Providence Road S & Church Parking Lot/Weddington Road



Liberty Classical Academy

2: Providence Road S & Lenny Stadler Way/Site Access 1

04/26/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↕			↖↗	
Traffic Volume (vph)	40	4	25	23	4	55	45	1228	4	4	1264	45
Future Volume (vph)	40	4	25	23	4	55	45	1228	4	4	1264	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			1%			1%	
Storage Length (ft)	0		50	0		425	325		0	0		0
Storage Lanes	0		1	0		1	1		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95
Frt			0.850			0.850		0.999			0.995	
Flt Protected		0.959			0.959		0.950					
Satd. Flow (prot)	0	1777	1575	0	1786	1583	1761	3518	0	0	3504	0
Flt Permitted		0.744			0.721		0.096				0.946	
Satd. Flow (perm)	0	1379	1575	0	1343	1583	178	3518	0	0	3315	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			10			35			35	
Link Distance (ft)		1059			530			2837			1141	
Travel Time (s)		20.6			36.1			55.3			22.2	
Peak Hour Factor	0.90	0.50	0.90	0.50	0.50	0.50	0.90	0.88	0.50	0.50	0.86	0.90
Adj. Flow (vph)	44	8	28	46	8	110	50	1395	8	8	1470	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	52	28	0	54	110	50	1403	0	0	1528	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	D.P+P	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8		8	6			6		
Detector Phase	4	4	5	8	8	8	5	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	10.0		10.0	10.0	
Minimum Split (s)	12.4	12.4	12.3	20.0	20.0	20.0	12.3	15.3		36.3	36.3	
Total Split (s)	20.0	20.0	12.3	20.0	20.0	20.0	12.3	70.0		57.7	57.7	
Total Split (%)	22.2%	22.2%	13.7%	22.2%	22.2%	22.2%	13.7%	77.8%		64.1%	64.1%	
Maximum Green (s)	14.6	14.6	7.0	13.0	13.0	13.0	7.0	64.7		52.4	52.4	
Yellow Time (s)	3.0	3.0	3.0	5.0	5.0	5.0	3.0	3.8		3.8	3.8	
All-Red Time (s)	2.4	2.4	2.3	2.0	2.0	2.0	2.3	1.5		1.5	1.5	
Lost Time Adjust (s)		-2.0	-0.3		-2.0	-2.0	-0.3	-0.3			-0.3	
Total Lost Time (s)		3.4	5.0		5.0	5.0	5.0	5.0			5.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Min		Min	Min	

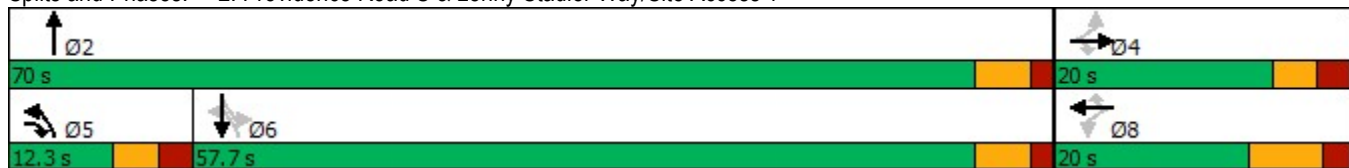


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										24.0	24.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		13.7	17.8		13.3	13.3	46.0	50.6				44.6
Actuated g/C Ratio		0.20	0.26		0.20	0.20	0.68	0.75				0.66
v/c Ratio		0.19	0.07		0.20	0.35	0.16	0.53				0.70
Control Delay		30.6	21.3		32.2	33.9	5.0	6.1				14.1
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0				0.0
Total Delay		30.6	21.3		32.2	33.9	5.0	6.1				14.1
LOS		C	C		C	C	A	A				B
Approach Delay		27.4			33.4			6.1				14.1
Approach LOS		C			C			A				B
Queue Length 50th (ft)		21	9		22	47	6	141				299
Queue Length 95th (ft)		31	31		33	57	16	199				382
Internal Link Dist (ft)		979			450			2757				1061
Turn Bay Length (ft)			50			425	325					
Base Capacity (vph)		394	415		347	409	320	3056				2563
Starvation Cap Reductn		0	0		0	0	0	0				0
Spillback Cap Reductn		0	0		0	0	0	0				0
Storage Cap Reductn		0	0		0	0	0	0				0
Reduced v/c Ratio		0.13	0.07		0.16	0.27	0.16	0.46				0.60

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 67.4  
 Natural Cycle: 75  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.70  
 Intersection Signal Delay: 11.8  
 Intersection Capacity Utilization 60.7%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service B

Splits and Phases: 2: Providence Road S & Lenny Stadler Way/Site Access 1



Liberty Classical Academy  
3: Providence Road S & Rae Road

04/26/2023



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	504	303	215	751	4	857	427
Future Volume (vph)	504	303	215	751	4	857	427
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-2%			1%		-1%	
Storage Length (ft)	0	0	450		325		0
Storage Lanes	1	1	2		1		1
Taper Length (ft)	100		100		100		
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00	1.00
Fr <sub>t</sub>		0.850					0.850
Fl <sub>t</sub> Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1787	1599	3416	3522	1778	1872	1591
Fl <sub>t</sub> Permitted	0.950		0.950		0.335		
Satd. Flow (perm)	1787	1599	3416	3522	627	1872	1591
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	45			45		45	
Link Distance (ft)	1371			1071		2837	
Travel Time (s)	20.8			16.2		43.0	
Peak Hour Factor	0.87	0.90	0.90	0.89	0.90	0.88	0.82
Adj. Flow (vph)	579	337	239	844	4	974	521
Shared Lane Traffic (%)							
Lane Group Flow (vph)	579	337	239	844	4	974	521
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	R NA	Left	Right
Median Width(ft)	12			24		24	
Link Offset(ft)	0			0		0	
Crosswalk Width(ft)	16			16		16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15	9	15		9		9
Turn Type	Prot	pm+ov	Prot	NA	Perm	NA	pm+ov
Protected Phases	4	5	5	2		6	4
Permitted Phases		4			6		6
Detector Phase	4	5	5	2	6	6	4
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	7.0
Minimum Split (s)	13.4	13.6	13.6	18.4	18.5	18.5	13.4
Total Split (s)	38.0	13.8	13.8	72.0	58.2	58.2	38.0
Total Split (%)	34.5%	12.5%	12.5%	65.5%	52.9%	52.9%	34.5%
Maximum Green (s)	31.6	7.2	7.2	65.6	51.7	51.7	31.6
Yellow Time (s)	4.7	3.0	3.0	4.4	4.6	4.6	4.7
All-Red Time (s)	1.7	3.6	3.6	2.0	1.9	1.9	1.7
Lost Time Adjust (s)	-1.4	-1.6	-1.6	-1.4	-1.5	-1.5	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	6.0	6.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0

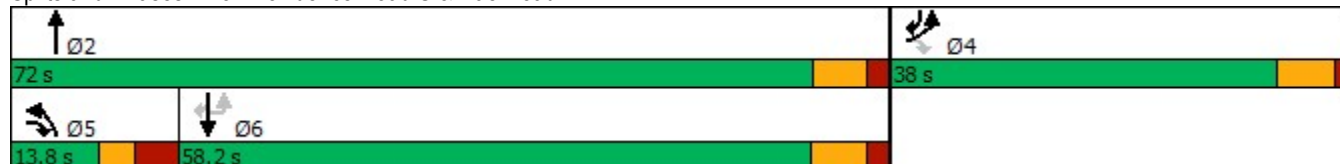


Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	30.0	30.0	30.0	0.0
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	33.0	46.8	8.8	67.0	53.2	53.2	91.2
Actuated g/C Ratio	0.30	0.43	0.08	0.61	0.48	0.48	0.83
v/c Ratio	1.08	0.50	0.88	0.39	0.01	1.08	0.39
Control Delay	99.9	26.2	80.9	11.7	15.0	81.5	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.9	26.2	80.9	11.7	15.0	81.5	3.4
LOS	F	C	F	B	B	F	A
Approach Delay	72.8			27.0		54.2	
Approach LOS	E			C		D	
Queue Length 50th (ft)	~458	170	87	150	1	~768	69
Queue Length 95th (ft)	#636	256	#158	187	8	#977	87
Internal Link Dist (ft)	1291			991		2757	
Turn Bay Length (ft)			450		325		
Base Capacity (vph)	536	680	273	2145	303	905	1319
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.50	0.88	0.39	0.01	1.08	0.39

Intersection Summary

Area Type: Other  
 Cycle Length: 110  
 Actuated Cycle Length: 110  
 Natural Cycle: 110  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.08  
 Intersection Signal Delay: 50.6      Intersection LOS: D  
 Intersection Capacity Utilization 91.7%      ICU Level of Service F  
 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: 3: Providence Road S & Rae Road



Intersection												
Int Delay, s/veh	1412											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	670	154	38	544	11	295	4	73	12	4	11
Future Vol, veh/h	12	670	154	38	544	11	295	4	73	12	4	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	125	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	89	50	50	90	90	50	50	50	90	50	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	753	308	76	604	12	590	8	146	13	8	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	616	0	0	1061	0	0	1705	1701	907	1766	1843	604
Stage 1	-	-	-	-	-	-	933	933	-	756	756	-
Stage 2	-	-	-	-	-	-	772	768	-	1010	1087	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	964	-	-	657	-	-	~ 72	92	334	65	75	498
Stage 1	-	-	-	-	-	-	~ 319	345	-	400	416	-
Stage 2	-	-	-	-	-	-	~ 392	411	-	289	292	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	964	-	-	657	-	-	~ 54	75	334	29	61	498
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 54	75	-	29	61	-
Stage 1	-	-	-	-	-	-	~ 315	341	-	395	343	-
Stage 2	-	-	-	-	-	-	~ 308	339	-	157	288	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.2	\$ 4821.1	142.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	65	964	-	-	657	-	-	55
HCM Lane V/C Ratio	11.446	0.014	-	-	0.116	-	-	0.61
HCM Control Delay (s)	\$ 4821.1	8.8	-	-	11.2	0	-	142.9
HCM Lane LOS	F	A	-	-	B	A	-	F
HCM 95th %tile Q(veh)	88	0	-	-	0.4	-	-	2.5

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

Intersection: 1: Providence Road S & Church Parking Lot/Weddington Road

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	T	R	L	L	T	TR
Maximum Queue (ft)	148	130	140	232	58	474	550	350	335	284	181	179
Average Queue (ft)	74	54	67	87	20	335	356	187	244	194	78	88
95th Queue (ft)	139	119	131	204	52	490	569	344	341	290	160	171
Link Distance (ft)	948		728			1067	1067				945	945
Upstream Blk Time (%)	0											
Queuing Penalty (veh)	3											
Storage Bay Dist (ft)		550		325	550			450	450	450		
Storage Blk Time (%)				0		0	2		0			
Queuing Penalty (veh)				0		0	9		0			

Intersection: 2: Providence Road S & Lenny Stadler Way/Site Access 1

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LT	R	LT	R	L	T	TR	LT	TR
Maximum Queue (ft)	91	61	42	35	126	440	453	370	371
Average Queue (ft)	40	20	12	6	41	127	159	179	170
95th Queue (ft)	87	50	40	28	109	452	480	350	346
Link Distance (ft)	1008					2759	2759	1067	1067
Upstream Blk Time (%)	0								
Queuing Penalty (veh)	0								
Storage Bay Dist (ft)		50		425	325				
Storage Blk Time (%)	13	3				2			
Queuing Penalty (veh)	4	2				2			

Intersection: 3: Providence Road S & Rae Road

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	T	U	T	R
Maximum Queue (ft)	469	133	223	254	217	242	66	417	141
Average Queue (ft)	300	64	145	185	144	146	7	251	67
95th Queue (ft)	495	122	230	254	217	227	66	408	132
Link Distance (ft)	1322	1322			1034	1034		2759	2759
Upstream Blk Time (%)	0								
Queuing Penalty (veh)	0								
Storage Bay Dist (ft)			450	450			325		
Storage Blk Time (%)								4	
Queuing Penalty (veh)								0	

Intersection: 4: Site Access 2/Wheatberry Hill Drive & Weddington Road

Movement	EB	EB	B5	B5	WB	WB	NB	SB
Directions Served	L	TR	T		LT	R	LTR	LTR
Maximum Queue (ft)	5	319	187	79	1226	157	1056	268
Average Queue (ft)	0	40	21	12	1197	15	983	163
95th Queue (ft)	6	301	210	159	1226	107	1233	313
Link Distance (ft)		866	728	728	1180		1003	954
Upstream Blk Time (%)		1	0	0	92		83	
Queuing Penalty (veh)		11	2	1	0		408	
Storage Bay Dist (ft)	125					125		
Storage Blk Time (%)		2			79			
Queuing Penalty (veh)		0			7			

Zone Summary

Zone wide Queuing Penalty: 451



Intersection: 1: Providence Road S & Church Parking Lot/Weddington Road

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	T	R	L	L	T	TR
Maximum Queue (ft)	58	167	183	267	26	396	403	344	300	241	162	174
Average Queue (ft)	19	81	95	135	3	262	274	199	204	153	77	86
95th Queue (ft)	50	160	174	259	17	396	402	333	291	250	155	167
Link Distance (ft)	948		728			1067	1067				945	945
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		550		325	550			450	450	450		
Storage Blk Time (%)				0			0					
Queuing Penalty (veh)				2			1					

Intersection: 2: Providence Road S & Lenny Stadler Way/Site Access 1

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LT	R	LT	R	L	T	TR	LT	TR
Maximum Queue (ft)	61	49	16	58	62	131	160	184	192
Average Queue (ft)	30	20	2	11	25	56	85	102	98
95th Queue (ft)	60	49	16	45	57	124	166	178	181
Link Distance (ft)	1008		454			2759	2759	1067	1067
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		50		425	325				
Storage Blk Time (%)	8	3							
Queuing Penalty (veh)	2	1							

Intersection: 3: Providence Road S & Rae Road

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	T	U	T	R
Maximum Queue (ft)	1010	638	181	218	194	194	144	862	619
Average Queue (ft)	675	272	106	151	113	107	11	582	167
95th Queue (ft)	1255	868	192	216	179	178	109	952	561
Link Distance (ft)	1322	1322			1034	1034		2759	2759
Upstream Blk Time (%)	7	5							
Queuing Penalty (veh)	0	0							
Storage Bay Dist (ft)			450	450			325		
Storage Blk Time (%)								37	
Queuing Penalty (veh)								1	

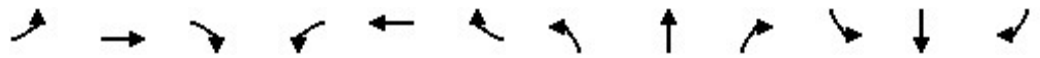
Intersection: 4: Site Access 2/Wheatberry Hill Drive & Weddington Road

Movement	EB	EB	B5	B5	WB	WB	NB	SB
Directions Served	L	TR	T		LT	R	LTR	LTR
Maximum Queue (ft)	51	495	172	50	897	178	1052	238
Average Queue (ft)	6	64	19	3	456	21	1030	114
95th Queue (ft)	41	410	189	71	1098	127	1098	278
Link Distance (ft)		866	728	728	1180		1003	954
Upstream Blk Time (%)		2	0		7		96	
Queuing Penalty (veh)		25	0		0		710	
Storage Bay Dist (ft)	125					125		
Storage Blk Time (%)		4			37			
Queuing Penalty (veh)		1			4			

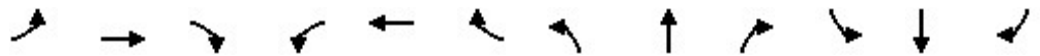
Zone Summary

Zone wide Queuing Penalty: 748

## **2028 Build Traffic Volumes**



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙	↘	↗	↖	↕	↗	↖	↕	↖
Traffic Volume (vph)	51	28	4	513	17	585	18	1087	309	438	735	4
Future Volume (vph)	51	28	4	513	17	585	18	1087	309	438	735	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			1%			-5%			5%	
Storage Length (ft)	0		0	550		325	550		450	450		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	0.95
Frt		0.994				0.850			0.850		0.999	
Flt Protected		0.970		0.950	0.955		0.950			0.950		
Satd. Flow (prot)	0	1841	0	1673	1682	1575	1814	3628	1623	3347	3447	0
Flt Permitted		0.626		0.950	0.955		0.950			0.950		
Satd. Flow (perm)	0	1188	0	1673	1682	1575	1814	3628	1623	3347	3447	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		1005			826			1141			1010	
Travel Time (s)		27.4			16.1			22.2			19.7	
Peak Hour Factor	0.90	0.90	0.90	0.82	0.90	0.80	0.90	0.90	0.79	0.77	0.88	0.90
Adj. Flow (vph)	57	31	4	626	19	731	20	1208	391	569	835	4
Shared Lane Traffic (%)				49%								
Lane Group Flow (vph)	0	92	0	319	326	731	20	1208	391	569	839	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.97	0.97	0.97	1.01	1.01	1.01	0.97	0.97	0.97	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases		4		3	3	1	5	2	3	1	6	
Permitted Phases	4					3			2			
Detector Phase	4	4		3	3	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	
Minimum Split (s)	13.7	13.7		13.6	13.6	13.4	13.4	19.1	13.6	13.4	17.6	
Total Split (s)	14.4	14.4		27.0	27.0	34.2	13.4	44.4	27.0	34.2	65.2	
Total Split (%)	12.0%	12.0%		22.5%	22.5%	28.5%	11.2%	37.0%	22.5%	28.5%	54.3%	
Maximum Green (s)	7.7	7.7		20.4	20.4	27.8	7.0	37.3	20.4	27.8	59.6	
Yellow Time (s)	3.5	3.5		3.8	3.8	3.0	3.1	5.0	3.8	3.0	4.1	
All-Red Time (s)	3.2	3.2		2.8	2.8	3.4	3.3	2.1	2.8	3.4	1.5	
Lost Time Adjust (s)		-1.7		-1.6	-1.6	-1.4	-1.4	-2.1	-1.6	-1.4	-0.6	
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	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	6.0	2.0	2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	
Recall Mode	None	None		None	None	None	None	Min	None	None	Min	
Walk Time (s)	4.0	4.0					4.0	4.0			4.0	
Flash Dont Walk (s)	25.0	25.0					27.0	33.0			12.0	
Pedestrian Calls (#/hr)	0	0					0	0			0	
Act Effct Green (s)		9.4		22.0	22.0	51.2	8.4	39.4	66.4	29.2	68.2	
Actuated g/C Ratio		0.08		0.18	0.18	0.43	0.07	0.33	0.55	0.24	0.57	
v/c Ratio		0.99		1.04	1.06	1.09	0.16	1.01	0.44	0.70	0.43	
Control Delay		146.3		110.7	114.7	87.7	55.7	69.9	17.7	46.7	16.6	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		146.3		110.7	114.7	87.7	55.7	69.9	17.7	46.7	16.6	
LOS		F		F	F	F	E	E	B	D	B	
Approach Delay		146.3			99.4			57.1			28.8	
Approach LOS		F			F			E			C	
Queue Length 50th (ft)		72		~281	~291	~492	15	~504	170	208	163	
Queue Length 95th (ft)		#183		#408	#485	#623	41	#656	206	223	264	
Internal Link Dist (ft)		925			746			1061			930	
Turn Bay Length (ft)				550		325	550		450	450		
Base Capacity (vph)		93		306	308	672	126	1191	898	814	1960	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.99		1.04	1.06	1.09	0.16	1.01	0.44	0.70	0.43	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Natural Cycle: 120

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.09

Intersection Signal Delay: 63.0

Intersection LOS: E

Intersection Capacity Utilization 84.6%

ICU Level of Service E

Analysis Period (min) 15

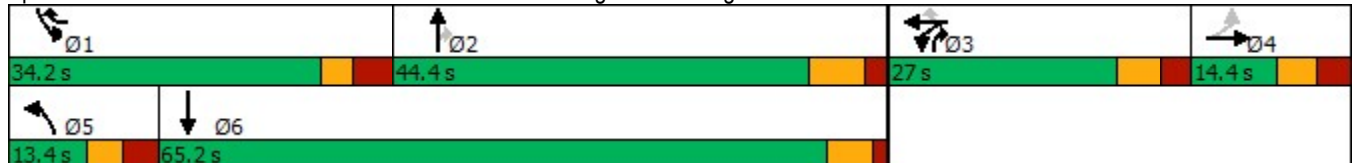
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

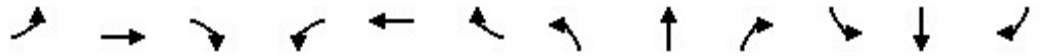
Splits and Phases: 1: Providence Road S & Church Parking Lot/Weddington Road



Liberty Classical Academy

2: Providence Road S & Lenny Stadler Way/Site Access 1

04/07/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↗	↖		↖	↗
Traffic Volume (vph)	43	4	32	4	4	4	83	1445	21	48	1134	67
Future Volume (vph)	43	4	32	4	4	4	83	1445	21	48	1134	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			1%			1%	
Storage Length (ft)	0		50	0		425	325		0	0		0
Storage Lanes	0		1	0		1	1		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95
Frt			0.850			0.850		0.996			0.992	
Flt Protected		0.959			0.976		0.950				0.997	
Satd. Flow (prot)	0	1777	1575	0	1818	1583	1761	3507	0	0	3483	0
Flt Permitted		0.745			0.813		0.950				0.667	
Satd. Flow (perm)	0	1381	1575	0	1514	1583	1761	3507	0	0	2330	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			10			35			35	
Link Distance (ft)		1059			530			2837			1141	
Travel Time (s)		20.6			36.1			55.3			22.2	
Peak Hour Factor	0.90	0.50	0.90	0.50	0.50	0.50	0.90	0.88	0.50	0.50	0.87	0.90
Adj. Flow (vph)	48	8	36	8	8	8	92	1642	42	96	1303	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	56	36	0	16	8	92	1684	0	0	1473	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	Prot	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8		8				6		
Detector Phase	4	4	5	8	8	8	5	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	10.0		10.0	10.0	
Minimum Split (s)	12.4	12.4	12.3	20.0	20.0	20.0	12.3	15.3		36.3	36.3	
Total Split (s)	20.0	20.0	12.3	20.0	20.0	20.0	12.3	70.0		57.7	57.7	
Total Split (%)	22.2%	22.2%	13.7%	22.2%	22.2%	22.2%	13.7%	77.8%		64.1%	64.1%	
Maximum Green (s)	14.6	14.6	7.0	13.0	13.0	13.0	7.0	64.7		52.4	52.4	
Yellow Time (s)	3.0	3.0	3.0	5.0	5.0	5.0	3.0	3.8		3.8	3.8	
All-Red Time (s)	2.4	2.4	2.3	2.0	2.0	2.0	2.3	1.5		1.5	1.5	
Lost Time Adjust (s)		-2.0	-0.3		-2.0	-2.0	-0.3	-0.3			-0.3	
Total Lost Time (s)		3.4	5.0		5.0	5.0	5.0	5.0			5.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Min		Min	Min	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										24.0	24.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		10.5	15.9		9.6	9.6	7.3	69.0				58.3
Actuated g/C Ratio		0.13	0.20		0.12	0.12	0.09	0.86				0.73
v/c Ratio		0.31	0.12		0.09	0.04	0.57	0.56				0.87
Control Delay		37.8	25.2		34.6	33.8	52.5	4.2				21.3
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0				0.0
Total Delay		37.8	25.2		34.6	33.8	52.5	4.2				21.3
LOS		D	C		C	C	D	A				C
Approach Delay		32.9			34.3			6.7				21.3
Approach LOS		C			C			A				C
Queue Length 50th (ft)		27	15		8	4	48	154				~378
Queue Length 95th (ft)		34	38		14	9	#116	229				#561
Internal Link Dist (ft)		979			450			2757				1061
Turn Bay Length (ft)			50			425	325					
Base Capacity (vph)		286	310		283	296	160	3011				1689
Starvation Cap Reductn		0	0		0	0	0	0				0
Spillback Cap Reductn		0	0		0	0	0	0				0
Storage Cap Reductn		0	0		0	0	0	0				0
Reduced v/c Ratio		0.20	0.12		0.06	0.03	0.57	0.56				0.87

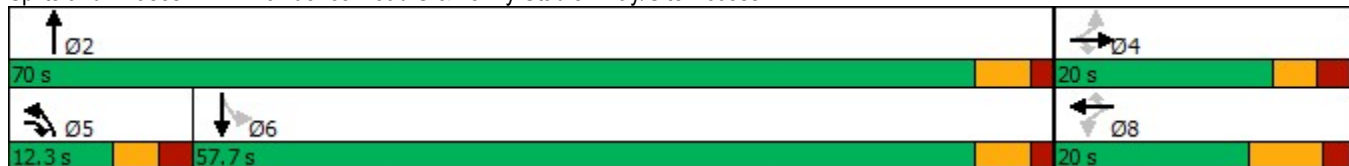
Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 80.4  
 Natural Cycle: 110  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.87  
 Intersection Signal Delay: 14.0  
 Intersection Capacity Utilization 85.7%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service E

~ 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: 2: Providence Road S & Lenny Stadler Way/Site Access 1



Liberty Classical Academy  
3: Providence Road S & Rae Road

04/07/2023



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	449	214	388	1107	4	650	421
Future Volume (vph)	449	214	388	1107	4	650	421
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-2%			1%		-1%	
Storage Length (ft)	0	0	450		325		0
Storage Lanes	1	1	2		1		1
Taper Length (ft)	100		100		100		
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00	1.00
Fr <sub>t</sub>		0.850					0.850
Fl <sub>t</sub> Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1787	1599	3416	3522	1778	1872	1591
Fl <sub>t</sub> Permitted	0.950		0.950		0.225		
Satd. Flow (perm)	1787	1599	3416	3522	421	1872	1591
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	45			45		45	
Link Distance (ft)	1371			1071		2837	
Travel Time (s)	20.8			16.2		43.0	
Peak Hour Factor	0.84	0.90	0.90	0.89	0.90	0.88	0.85
Adj. Flow (vph)	535	238	431	1244	4	739	495
Shared Lane Traffic (%)							
Lane Group Flow (vph)	535	238	431	1244	4	739	495
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	R NA	Left	Right
Median Width(ft)	12			24		24	
Link Offset(ft)	0			0		0	
Crosswalk Width(ft)	16			16		16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15	9	15		9		9
Turn Type	Prot	pm+ov	Prot	NA	Perm	NA	pm+ov
Protected Phases	4	5	5	2		6	4
Permitted Phases		4			6		6
Detector Phase	4	5	5	2	6	6	4
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	7.0
Minimum Split (s)	13.4	13.6	13.6	18.4	18.5	18.5	13.4
Total Split (s)	32.0	17.0	17.0	58.0	41.0	41.0	32.0
Total Split (%)	35.6%	18.9%	18.9%	64.4%	45.6%	45.6%	35.6%
Maximum Green (s)	25.6	10.4	10.4	51.6	34.5	34.5	25.6
Yellow Time (s)	4.7	3.0	3.0	4.4	4.6	4.6	4.7
All-Red Time (s)	1.7	3.6	3.6	2.0	1.9	1.9	1.7
Lost Time Adjust (s)	-1.4	-1.6	-1.6	-1.4	-1.5	-1.5	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	6.0	6.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0



Liberty Classical Academy  
 3: Providence Road S & Rae Road

04/07/2023

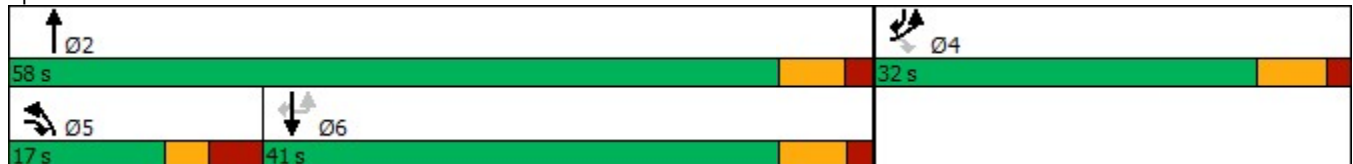


Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	30.0	30.0	30.0	0.0
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	27.0	44.0	12.0	53.0	36.0	36.0	68.0
Actuated g/C Ratio	0.30	0.49	0.13	0.59	0.40	0.40	0.76
v/c Ratio	1.00	0.30	0.95	0.60	0.02	0.99	0.41
Control Delay	71.8	15.2	71.1	13.3	17.0	58.6	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.8	15.2	71.1	13.3	17.0	58.6	5.1
LOS	E	B	E	B	B	E	A
Approach Delay	54.4			28.2		37.1	
Approach LOS	D			C		D	
Queue Length 50th (ft)	303	78	126	218	1	407	80
Queue Length 95th (ft)	#459	129	#218	274	8	#627	112
Internal Link Dist (ft)	1291			991		2757	
Turn Bay Length (ft)			450		325		
Base Capacity (vph)	536	781	455	2074	168	748	1202
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.30	0.95	0.60	0.02	0.99	0.41

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 36.7      Intersection LOS: D  
 Intersection Capacity Utilization 82.7%      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: 3: Providence Road S & Rae Road



Intersection												
Int Delay, s/veh	1243.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	427	224	56	789	8	224	4	56	6	4	11
Future Vol, veh/h	6	427	224	56	789	8	224	4	56	6	4	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	125	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	50	50	89	90	50	50	50	90	50	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	474	448	112	887	9	448	8	112	7	8	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	896	0	0	922	0	0	1838	1832	698	1883	2047	887
Stage 1	-	-	-	-	-	-	712	712	-	1111	1111	-
Stage 2	-	-	-	-	-	-	1126	1120	-	772	936	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	757	-	-	741	-	-	~ 58	76	440	54	56	343
Stage 1	-	-	-	-	-	-	~ 423	436	-	254	285	-
Stage 2	-	-	-	-	-	-	~ 249	282	-	392	344	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	757	-	-	741	-	-	~ 36	53	440	27	39	343
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 36	53	-	27	39	-
Stage 1	-	-	-	-	-	-	~ 419	432	-	252	199	-
Stage 2	-	-	-	-	-	-	~ 161	197	-	284	341	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			1.2			\$ 5533.2			121.7		
HCM LOS							F			F		

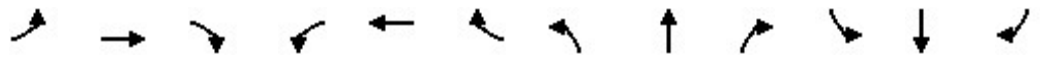
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	44	757	-	-	741	-	-	55
HCM Lane V/C Ratio	12.909	0.009	-	-	0.151	-	-	0.489
HCM Control Delay (s)	\$ 5533.2	9.8	-	-	10.7	0	-	121.7
HCM Lane LOS	F	A	-	-	B	A	-	F
HCM 95th %tile Q(veh)	68.6	0	-	-	0.5	-	-	1.9

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

Liberty Classical Academy

1: Providence Road S & Church Parking Lot/Weddington Road

04/07/2023

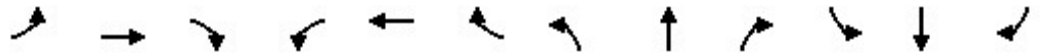


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	11	4	364	4	484	4	894	436	569	952	4
Future Volume (vph)	7	11	4	364	4	484	4	894	436	569	952	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			1%			-5%			5%	
Storage Length (ft)	0		0	550		325	550		450	450		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	0.95
Fr <sub>t</sub>		0.977				0.850			0.850		0.999	
Fl <sub>t</sub> Protected		0.984		0.950	0.953		0.950			0.950		
Satd. Flow (prot)	0	1836	0	1673	1678	1575	1814	3628	1623	3347	3447	0
Fl <sub>t</sub> Permitted		0.799		0.950	0.953		0.950			0.950		
Satd. Flow (perm)	0	1490	0	1673	1678	1575	1814	3628	1623	3347	3447	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		1005			826			1141			1010	
Travel Time (s)		27.4			16.1			22.2			19.7	
Peak Hour Factor	0.90	0.90	0.90	0.84	0.90	0.82	0.90	0.88	0.83	0.83	0.90	0.90
Adj. Flow (vph)	8	12	4	433	4	590	4	1016	525	686	1058	4
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	24	0	216	221	590	4	1016	525	686	1062	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.97	0.97	0.97	1.01	1.01	1.01	0.97	0.97	0.97	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases		4		3	3	1	5	2	3	1	6	
Permitted Phases	4					3			2			
Detector Phase	4	4		3	3	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	
Minimum Split (s)	13.7	13.7		13.6	13.6	13.4	13.4	19.1	13.6	13.4	17.6	
Total Split (s)	13.7	13.7		25.4	25.4	36.8	13.4	44.1	25.4	36.8	67.5	
Total Split (%)	11.4%	11.4%		21.2%	21.2%	30.7%	11.2%	36.8%	21.2%	30.7%	56.3%	
Maximum Green (s)	7.0	7.0		18.8	18.8	30.4	7.0	37.0	18.8	30.4	61.9	
Yellow Time (s)	3.5	3.5		3.8	3.8	3.0	3.1	5.0	3.8	3.0	4.1	
All-Red Time (s)	3.2	3.2		2.8	2.8	3.4	3.3	2.1	2.8	3.4	1.5	
Lost Time Adjust (s)		-1.7		-1.6	-1.6	-1.4	-1.4	-2.1	-1.6	-1.4	-0.6	
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	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	6.0	2.0	2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	

Liberty Classical Academy

1: Providence Road S & Church Parking Lot/Weddington Road

04/07/2023

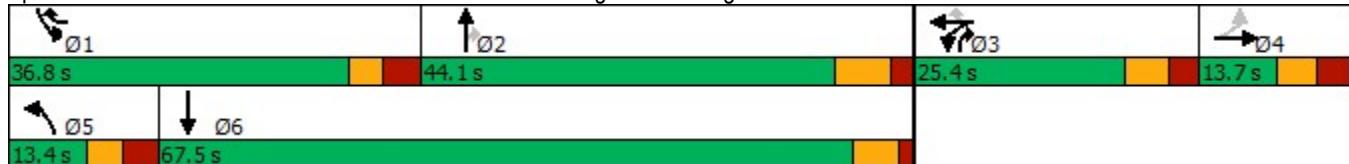


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	
Recall Mode	None	None		None	None	None	None	Min	None	None	Min	
Walk Time (s)	4.0	4.0					4.0	4.0			4.0	
Flash Dont Walk (s)	25.0	25.0					27.0	33.0			12.0	
Pedestrian Calls (#/hr)	0	0					0	0			0	
Act Effct Green (s)		9.2		18.2	18.2	48.2	8.9	34.1	57.5	27.3	64.4	
Actuated g/C Ratio		0.09		0.18	0.18	0.47	0.09	0.33	0.56	0.27	0.63	
v/c Ratio		0.18		0.73	0.74	0.80	0.03	0.84	0.58	0.77	0.49	
Control Delay		55.1		58.9	59.8	30.6	52.5	40.9	19.6	43.1	13.1	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		55.1		58.9	59.8	30.6	52.5	40.9	19.6	43.1	13.1	
LOS		E		E	E	C	D	D	B	D	B	
Approach Delay		55.1			42.8			33.7			24.8	
Approach LOS		E			D			C			C	
Queue Length 50th (ft)		18		169	174	283	3	386	267	254	214	
Queue Length 95th (ft)		46		#253	#301	343	15	459	334	291	355	
Internal Link Dist (ft)		925			746			1061			930	
Turn Bay Length (ft)				550		325	550		450	450		
Base Capacity (vph)		133		351	353	837	156	1462	964	1097	2375	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.18		0.62	0.63	0.70	0.03	0.69	0.54	0.63	0.45	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 102.4  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 32.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 73.0%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

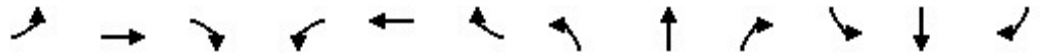
Splits and Phases: 1: Providence Road S & Church Parking Lot/Weddington Road



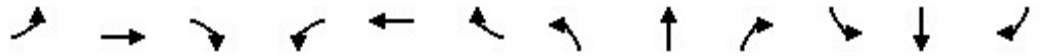
Liberty Classical Academy

2: Providence Road S & Lenny Stadler Way/Site Access 1

04/07/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↕			↖↗	
Traffic Volume (vph)	42	4	26	21	4	48	48	1288	4	4	1271	48
Future Volume (vph)	42	4	26	21	4	48	48	1288	4	4	1271	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			1%			1%	
Storage Length (ft)	0		50	0		425	325		0	0		0
Storage Lanes	0		1	0		1	1		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95
Frt			0.850			0.850		0.999			0.995	
Flt Protected		0.959			0.960		0.950					
Satd. Flow (prot)	0	1777	1575	0	1788	1583	1761	3518	0	0	3504	0
Flt Permitted		0.739			0.722		0.950				0.945	
Satd. Flow (perm)	0	1370	1575	0	1345	1583	1761	3518	0	0	3311	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			10			35			35	
Link Distance (ft)		1059			530			2837			1141	
Travel Time (s)		20.6			36.1			55.3			22.2	
Peak Hour Factor	0.90	0.50	0.90	0.50	0.50	0.50	0.90	0.88	0.50	0.50	0.88	0.90
Adj. Flow (vph)	47	8	29	42	8	96	53	1464	8	8	1444	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	55	29	0	50	96	53	1472	0	0	1505	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	Prot	NA		Perm	NA	
Protected Phases		4	5		8		5	2				6
Permitted Phases	4		4	8		8				6		
Detector Phase	4	4	5	8	8	8	5	2		6		6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	10.0		10.0	10.0	
Minimum Split (s)	12.4	12.4	12.3	20.0	20.0	20.0	12.3	15.3		36.3	36.3	
Total Split (s)	20.0	20.0	12.3	20.0	20.0	20.0	12.3	70.0		57.7	57.7	
Total Split (%)	22.2%	22.2%	13.7%	22.2%	22.2%	22.2%	13.7%	77.8%		64.1%	64.1%	
Maximum Green (s)	14.6	14.6	7.0	13.0	13.0	13.0	7.0	64.7		52.4	52.4	
Yellow Time (s)	3.0	3.0	3.0	5.0	5.0	5.0	3.0	3.8		3.8	3.8	
All-Red Time (s)	2.4	2.4	2.3	2.0	2.0	2.0	2.3	1.5		1.5	1.5	
Lost Time Adjust (s)		-2.0	-0.3		-2.0	-2.0	-0.3	-0.3			-0.3	
Total Lost Time (s)		3.4	5.0		5.0	5.0	5.0	5.0			5.0	
Lead/Lag			Lead					Lead			Lag	
Lead-Lag Optimize?			Yes					Yes			Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Min		Min	Min	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										24.0	24.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		13.4	17.4		12.9	12.9	8.5	49.3				43.4
Actuated g/C Ratio		0.20	0.26		0.20	0.20	0.13	0.75				0.66
v/c Ratio		0.20	0.07		0.19	0.31	0.23	0.56				0.69
Control Delay		30.5	21.0		31.8	32.9	38.0	6.3				13.7
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0				0.0
Total Delay		30.5	21.0		31.8	32.9	38.0	6.3				13.7
LOS		C	C		C	C	D	A				B
Approach Delay		27.2			32.5			7.4				13.7
Approach LOS		C			C			A				B
Queue Length 50th (ft)		21	9		20	39	23	146				283
Queue Length 95th (ft)		32	32		31	51	66	215				390
Internal Link Dist (ft)		979			450			2757				1061
Turn Bay Length (ft)			50			425	325					
Base Capacity (vph)		400	416		355	418	226	3092				2610
Starvation Cap Reductn		0	0		0	0	0	0				0
Spillback Cap Reductn		0	0		0	0	0	0				0
Storage Cap Reductn		0	0		0	0	0	0				0
Reduced v/c Ratio		0.14	0.07		0.14	0.23	0.23	0.48				0.58

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 65.8  
 Natural Cycle: 75  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.69  
 Intersection Signal Delay: 12.0  
 Intersection LOS: B  
 Intersection Capacity Utilization 60.9%  
 ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 2: Providence Road S & Lenny Stadler Way/Site Access 1



Liberty Classical Academy  
3: Providence Road S & Rae Road

04/07/2023



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	529	318	226	788	4	881	407
Future Volume (vph)	529	318	226	788	4	881	407
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-2%			1%		-1%	
Storage Length (ft)	0	0	450		325		0
Storage Lanes	1	1	2		1		1
Taper Length (ft)	100		100		100		
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00	1.00
Fr <sub>t</sub>		0.850					0.850
Fl <sub>t</sub> Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1787	1599	3416	3522	1778	1872	1591
Fl <sub>t</sub> Permitted	0.950		0.950		0.321		
Satd. Flow (perm)	1787	1599	3416	3522	601	1872	1591
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	45			45		45	
Link Distance (ft)	1371			1071		2837	
Travel Time (s)	20.8			16.2		43.0	
Peak Hour Factor	0.87	0.90	0.90	0.89	0.90	0.89	0.85
Adj. Flow (vph)	608	353	251	885	4	990	479
Shared Lane Traffic (%)							
Lane Group Flow (vph)	608	353	251	885	4	990	479
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	R NA	Left	Right
Median Width(ft)	12			24		24	
Link Offset(ft)	0			0		0	
Crosswalk Width(ft)	16			16		16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15	9	15		9		9
Turn Type	Prot	pm+ov	Prot	NA	Perm	NA	pm+ov
Protected Phases	4	5	5	2		6	4
Permitted Phases		4			6		6
Detector Phase	4	5	5	2	6	6	4
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	7.0
Minimum Split (s)	13.4	13.6	13.6	18.4	18.5	18.5	13.4
Total Split (s)	42.6	14.0	14.0	77.4	63.4	63.4	42.6
Total Split (%)	35.5%	11.7%	11.7%	64.5%	52.8%	52.8%	35.5%
Maximum Green (s)	36.2	7.4	7.4	71.0	56.9	56.9	36.2
Yellow Time (s)	4.7	3.0	3.0	4.4	4.6	4.6	4.7
All-Red Time (s)	1.7	3.6	3.6	2.0	1.9	1.9	1.7
Lost Time Adjust (s)	-1.4	-1.6	-1.6	-1.4	-1.5	-1.5	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	6.0	6.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0

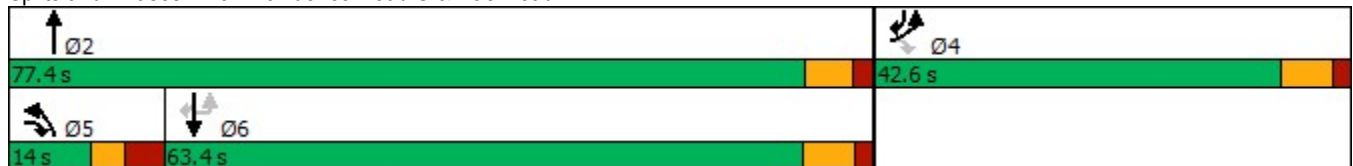


Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	30.0	30.0	30.0	0.0
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	37.6	51.6	9.0	72.4	58.4	58.4	101.0
Actuated g/C Ratio	0.31	0.43	0.08	0.60	0.49	0.49	0.84
v/c Ratio	1.09	0.51	0.98	0.42	0.01	1.09	0.36
Control Delay	103.5	28.3	107.1	13.4	16.2	86.9	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.5	28.3	107.1	13.4	16.2	86.9	3.0
LOS	F	C	F	B	B	F	A
Approach Delay	75.9			34.1		59.4	
Approach LOS	E			C		E	
Queue Length 50th (ft)	~529	196	102	179	2	~861	62
Queue Length 95th (ft)	#712	288	#188	220	8	#1092	81
Internal Link Dist (ft)	1291			991		2757	
Turn Bay Length (ft)				450		325	
Base Capacity (vph)	559	687	256	2124	292	911	1339
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.09	0.51	0.98	0.42	0.01	1.09	0.36

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Natural Cycle: 120  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.09  
 Intersection Signal Delay: 55.8  
 Intersection LOS: E  
 Intersection Capacity Utilization 94.6%  
 ICU Level of Service F  
 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: 3: Providence Road S & Rae Road





Intersection												
Int Delay, s/veh	503.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	700	157	39	571	11	157	4	39	12	4	11
Future Vol, veh/h	12	700	157	39	571	11	157	4	39	12	4	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	125	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	89	50	50	90	90	50	50	50	90	50	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	787	314	78	634	12	314	8	78	13	8	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	646	0	0	1101	0	0	1776	1772	944	1803	1917	634
Stage 1	-	-	-	-	-	-	970	970	-	790	790	-
Stage 2	-	-	-	-	-	-	806	802	-	1013	1127	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	939	-	-	634	-	-	~ 64	83	318	62	67	479
Stage 1	-	-	-	-	-	-	~ 304	331	-	383	402	-
Stage 2	-	-	-	-	-	-	376	396	-	288	280	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	939	-	-	634	-	-	~ 47	66	318	36	53	479
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 47	66	-	36	53	-
Stage 1	-	-	-	-	-	-	~ 300	326	-	378	325	-
Stage 2	-	-	-	-	-	-	~ 289	320	-	209	276	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.2	\$ 2847.8	120.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	57	939	-	-	634	-	-	61
HCM Lane V/C Ratio	7.018	0.014	-	-	0.123	-	-	0.55
HCM Control Delay (s)	\$ 2847.8	8.9	-	-	11.5	0	-	120.4
HCM Lane LOS	F	A	-	-	B	A	-	F
HCM 95th %tile Q(veh)	46.1	0	-	-	0.4	-	-	2.2

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

Intersection: 1: Providence Road S & Church Parking Lot/Weddington Road

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	T	R	L	L	T	TR
Maximum Queue (ft)	151	204	258	382	295	784	792	525	331	270	188	197
Average Queue (ft)	78	97	116	200	58	587	600	316	236	187	105	108
95th Queue (ft)	144	185	228	374	307	1024	1033	648	333	279	183	190
Link Distance (ft)	948		728			1068	1068				945	945
Upstream Blk Time (%)						1	1					
Queuing Penalty (veh)						8	10					
Storage Bay Dist (ft)		550		325	550			450	450	450		
Storage Blk Time (%)				3		18	29		0			
Queuing Penalty (veh)				18		4	112		0			

Intersection: 2: Providence Road S & Lenny Stadler Way/Site Access 1

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LT	R	LT	R	L	T	TR	LT	TR
Maximum Queue (ft)	98	61	49	34	107	408	437	406	411
Average Queue (ft)	42	24	14	7	55	122	151	237	234
95th Queue (ft)	87	54	45	30	102	432	465	407	417
Link Distance (ft)	1008					2759	2759	1068	1068
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		50		425	325				
Storage Blk Time (%)	16	4				2			
Queuing Penalty (veh)	6	2				2			

Intersection: 3: Providence Road S & Rae Road

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	T	U	T	R
Maximum Queue (ft)	578	149	263	312	232	233	24	516	313
Average Queue (ft)	393	72	176	220	153	153	3	338	102
95th Queue (ft)	692	135	291	324	230	230	16	558	248
Link Distance (ft)	1322	1322			1034	1034		2759	2759
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			450	450			325		
Storage Blk Time (%)				0				15	
Queuing Penalty (veh)				0				1	

Intersection: 4: Site Access 2/Wheatberry Hill Drive & Weddington Road

Movement	EB	EB	B5	B5	WB	WB	NB	SB
Directions Served	L	TR	T		LT	R	LTR	LTR
Maximum Queue (ft)	20	859	476	163	1218	134	1054	230
Average Queue (ft)	2	152	51	11	1076	9	997	135
95th Queue (ft)	14	666	304	138	1565	81	1201	278
Link Distance (ft)		866	728	728	1180		1001	954
Upstream Blk Time (%)		5			64		82	
Queuing Penalty (veh)		50			0		457	
Storage Bay Dist (ft)	125					125		
Storage Blk Time (%)		11			63			
Queuing Penalty (veh)		1			6			

Zone Summary

Zone wide Queuing Penalty: 676

Intersection: 1: Providence Road S & Church Parking Lot/Weddington Road

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	T	R	L	L	T	TR
Maximum Queue (ft)	60	158	197	298	25	489	518	388	370	320	339	345
Average Queue (ft)	21	81	86	127	4	253	315	223	252	207	141	129
95th Queue (ft)	55	158	183	274	22	477	673	412	395	386	508	430
Link Distance (ft)	948		728			1068	1068				945	945
Upstream Blk Time (%)							5				6	0
Queuing Penalty (veh)							41				0	0
Storage Bay Dist (ft)		550		325	550			450	450	450		
Storage Blk Time (%)				1		0	1	7	3	7		
Queuing Penalty (veh)				4		0	3	36	17	35		

Intersection: 2: Providence Road S & Lenny Stadler Way/Site Access 1

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LT	R	LT	R	L	T	TR	LT	TR
Maximum Queue (ft)	80	50	62	88	74	560	591	267	275
Average Queue (ft)	37	16	12	23	30	123	152	119	118
95th Queue (ft)	75	43	48	74	66	630	652	238	244
Link Distance (ft)	1008		454			2759	2759	1068	1068
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		50		425	325				
Storage Blk Time (%)	11	2				4			
Queuing Penalty (veh)	3	1				2			

Intersection: 3: Providence Road S & Rae Road

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	T	U	T	R
Maximum Queue (ft)	1238	965	202	234	212	204	218	1335	1080
Average Queue (ft)	854	391	140	175	122	124	16	941	421
95th Queue (ft)	1380	1084	223	236	203	202	142	1642	1195
Link Distance (ft)	1322	1322			1034	1034		2759	2759
Upstream Blk Time (%)	9	4							
Queuing Penalty (veh)	0	0							
Storage Bay Dist (ft)			450	450			325		
Storage Blk Time (%)								47	
Queuing Penalty (veh)								2	

Intersection: 4: Site Access 2/Wheatberry Hill Drive & Weddington Road

Movement	EB	EB	B5	B5	WB	WB	NB	SB
Directions Served	L	TR	T		LT	R	LTR	LTR
Maximum Queue (ft)	46	459	393	203	1095	90	1048	335
Average Queue (ft)	4	157	105	76	820	7	989	203
95th Queue (ft)	37	702	510	441	1510	74	1207	427
Link Distance (ft)		866	728	728	1180		1001	954
Upstream Blk Time (%)		11	9	8	38		82	
Queuing Penalty (veh)		135	52	51	0		321	
Storage Bay Dist (ft)	125					125		
Storage Blk Time (%)		13			59			
Queuing Penalty (veh)		2			7			

Zone Summary

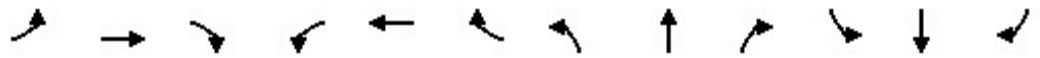
Zone wide Queuing Penalty: 714

## **2031 Build Traffic Volumes**

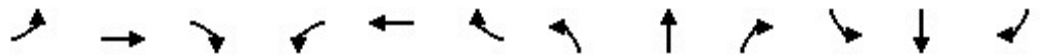
Liberty Classical Academy

1: Providence Road S & Church Parking Lot/Weddington Road

04/25/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙	↘	↗	↖	↑↑	↗	↖↗	↖↗	
Traffic Volume (vph)	55	30	4	526	18	591	19	1171	309	432	782	4
Future Volume (vph)	55	30	4	526	18	591	19	1171	309	432	782	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			1%			-5%			5%	
Storage Length (ft)	0		0	550		325	550		450	450		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	0.95
Fr <sub>t</sub>		0.994				0.850			0.850		0.999	
Fl <sub>t</sub> Protected		0.970		0.950	0.955		0.950			0.950		
Satd. Flow (prot)	0	1841	0	1673	1682	1575	1814	3628	1623	3347	3447	0
Fl <sub>t</sub> Permitted		0.628		0.950	0.955		0.950			0.950		
Satd. Flow (perm)	0	1192	0	1673	1682	1575	1814	3628	1623	3347	3447	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		1005			826			1141			1010	
Travel Time (s)		27.4			16.1			22.2			19.7	
Peak Hour Factor	0.90	0.90	0.90	0.84	0.90	0.82	0.90	0.90	0.81	0.80	0.89	0.90
Adj. Flow (vph)	61	33	4	626	20	721	21	1301	381	540	879	4
Shared Lane Traffic (%)				48%								
Lane Group Flow (vph)	0	98	0	326	320	721	21	1301	381	540	883	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.97	0.97	0.97	1.01	1.01	1.01	0.97	0.97	0.97	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases		4		3	3	1	5	2	3	1	6	
Permitted Phases	4					3			2			
Detector Phase	4	4		3	3	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	
Minimum Split (s)	13.7	13.7		13.6	13.6	13.4	13.4	19.1	13.6	13.4	17.6	
Total Split (s)	14.0	14.0		26.0	26.0	32.0	13.4	48.0	26.0	32.0	66.6	
Total Split (%)	11.7%	11.7%		21.7%	21.7%	26.7%	11.2%	40.0%	21.7%	26.7%	55.5%	
Maximum Green (s)	7.3	7.3		19.4	19.4	25.6	7.0	40.9	19.4	25.6	61.0	
Yellow Time (s)	3.5	3.5		3.8	3.8	3.0	3.1	5.0	3.8	3.0	4.1	
All-Red Time (s)	3.2	3.2		2.8	2.8	3.4	3.3	2.1	2.8	3.4	1.5	
Lost Time Adjust (s)		-1.7		-1.6	-1.6	-1.4	-1.4	-2.1	-1.6	-1.4	-0.6	
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	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	6.0	2.0	2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	
Recall Mode	None	None		None	None	None	None	Min	None	None	Min	
Walk Time (s)	4.0	4.0					4.0	4.0			4.0	
Flash Dont Walk (s)	25.0	25.0					27.0	33.0			12.0	
Pedestrian Calls (#/hr)	0	0					0	0			0	
Act Effct Green (s)		9.0		21.0	21.0	48.0	8.4	43.0	69.0	27.0	69.6	
Actuated g/C Ratio		0.08		0.18	0.18	0.40	0.07	0.36	0.58	0.22	0.58	
v/c Ratio		1.10		1.12	1.09	1.14	0.17	1.00	0.41	0.72	0.44	
Control Delay		176.6		133.2	124.6	110.7	55.8	63.9	15.8	49.2	16.0	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		176.6		133.2	124.6	110.7	55.8	63.9	15.8	49.2	16.0	
LOS		F		F	F	F	E	E	B	D	B	
Approach Delay		176.6			119.3			53.0			28.6	
Approach LOS		F			F			D			C	
Queue Length 50th (ft)		~86		~305	~293	~558	16	~527	156	200	169	
Queue Length 95th (ft)		#199		#449	#485	#766	42	#689	195	227	278	
Internal Link Dist (ft)		925			746			1061			930	
Turn Bay Length (ft)				550		325	550		450	450		
Base Capacity (vph)		89		292	294	630	126	1300	933	753	2000	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		1.10		1.12	1.09	1.14	0.17	1.00	0.41	0.72	0.44	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Natural Cycle: 120

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.14

Intersection Signal Delay: 67.8

Intersection LOS: E

Intersection Capacity Utilization 87.3%

ICU Level of Service E

Analysis Period (min) 15

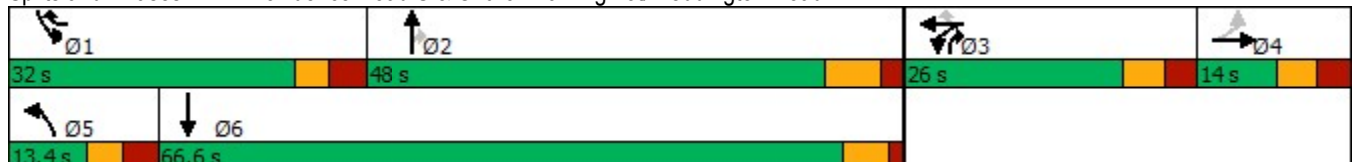
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Providence Road S & Church Parking Lot/Weddington Road

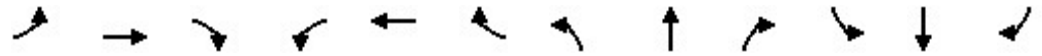




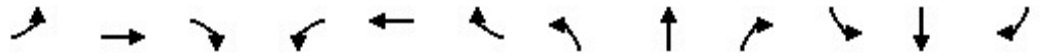
Liberty Classical Academy

2: Providence Road S & Lenny Stadler Way/Site Access 1

04/25/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↗	↖		↖	↗
Traffic Volume (vph)	46	4	34	4	4	4	89	1533	17	39	1198	72
Future Volume (vph)	46	4	34	4	4	4	89	1533	17	39	1198	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			1%			1%	
Storage Length (ft)	0		50	0		425	325		0	0		0
Storage Lanes	0		1	0		1	1		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95
Frt			0.850			0.850		0.997			0.992	
Flt Protected		0.959			0.976		0.950				0.997	
Satd. Flow (prot)	0	1777	1575	0	1818	1583	1761	3511	0	0	3483	0
Flt Permitted		0.744			0.811		0.950				0.702	
Satd. Flow (perm)	0	1379	1575	0	1511	1583	1761	3511	0	0	2452	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			10			35			35	
Link Distance (ft)		1059			785			2837			1141	
Travel Time (s)		20.6			53.5			55.3			22.2	
Peak Hour Factor	0.90	0.50	0.90	0.50	0.50	0.50	0.90	0.88	0.50	0.50	0.88	0.90
Adj. Flow (vph)	51	8	38	8	8	8	99	1742	34	78	1361	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	59	38	0	16	8	99	1776	0	0	1519	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	Prot	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8		8				6		
Detector Phase	4	4	5	8	8	8	5	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	10.0		10.0	10.0	
Minimum Split (s)	12.4	12.4	12.3	20.0	20.0	20.0	12.3	15.3		36.3	36.3	
Total Split (s)	20.0	20.0	12.3	20.0	20.0	20.0	12.3	70.0		57.7	57.7	
Total Split (%)	22.2%	22.2%	13.7%	22.2%	22.2%	22.2%	13.7%	77.8%		64.1%	64.1%	
Maximum Green (s)	14.6	14.6	7.0	13.0	13.0	13.0	7.0	64.7		52.4	52.4	
Yellow Time (s)	3.0	3.0	3.0	5.0	5.0	5.0	3.0	3.8		3.8	3.8	
All-Red Time (s)	2.4	2.4	2.3	2.0	2.0	2.0	2.3	1.5		1.5	1.5	
Lost Time Adjust (s)		-2.0	-0.3		-2.0	-2.0	-0.3	-0.3			-0.3	
Total Lost Time (s)		3.4	5.0		5.0	5.0	5.0	5.0			5.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Min		Min	Min	

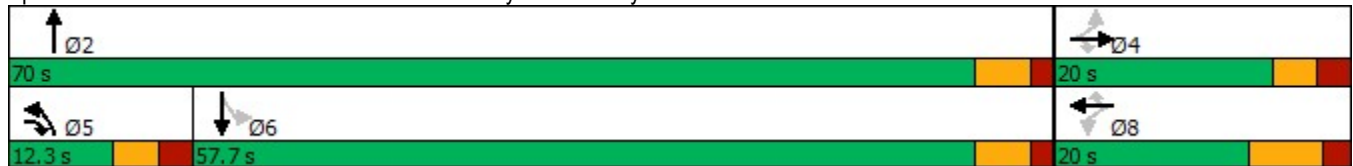


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										24.0	24.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		11.0	18.9		9.8	9.8	7.3	67.1				57.6
Actuated g/C Ratio		0.13	0.23		0.12	0.12	0.09	0.81				0.70
v/c Ratio		0.32	0.11		0.09	0.04	0.63	0.62				0.89
Control Delay		38.3	24.6		34.6	33.8	57.9	5.4				23.3
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0				0.0
Total Delay		38.3	24.6		34.6	33.8	57.9	5.4				23.3
LOS		D	C		C	C	E	A				C
Approach Delay		32.9			34.3			8.2				23.3
Approach LOS		C			C			A				C
Queue Length 50th (ft)		29	15		8	4	52	171				370
Queue Length 95th (ft)		35	39		14	9	#127	258				#580
Internal Link Dist (ft)		979			705			2757				1061
Turn Bay Length (ft)			50			425	325					
Base Capacity (vph)		278	360		275	288	156	2853				1709
Starvation Cap Reductn		0	0		0	0	0	0				0
Spillback Cap Reductn		0	0		0	0	0	0				0
Storage Cap Reductn		0	0		0	0	0	0				0
Reduced v/c Ratio		0.21	0.11		0.06	0.03	0.63	0.62				0.89

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 82.6  
 Natural Cycle: 100  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 15.6  
 Intersection LOS: B  
 Intersection Capacity Utilization 90.9%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 2: Providence Road S & Lenny Stadler Way/Site Access 1



Liberty Classical Academy  
3: Providence Road S & Rae Road

04/25/2023



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	465	230	418	1182	4	692	439
Future Volume (vph)	465	230	418	1182	4	692	439
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-2%			1%		-1%	
Storage Length (ft)	0	0	450		325		0
Storage Lanes	1	1	2		1		1
Taper Length (ft)	100		100		100		
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00	1.00
Fr <sub>t</sub>		0.850					0.850
Fl <sub>t</sub> Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1787	1599	3416	3522	1778	1872	1591
Fl <sub>t</sub> Permitted	0.950		0.950		0.202		
Satd. Flow (perm)	1787	1599	3416	3522	378	1872	1591
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	45			45		45	
Link Distance (ft)	1371			1071		2837	
Travel Time (s)	20.8			16.2		43.0	
Peak Hour Factor	0.85	0.90	0.90	0.89	0.90	0.89	0.86
Adj. Flow (vph)	547	256	464	1328	4	778	510
Shared Lane Traffic (%)							
Lane Group Flow (vph)	547	256	464	1328	4	778	510
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	R NA	Left	Right
Median Width(ft)	12			24		24	
Link Offset(ft)	0			0		0	
Crosswalk Width(ft)	16			16		16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15	9	15		9		9
Turn Type	Prot	pm+ov	Prot	NA	Perm	NA	pm+ov
Protected Phases	4	5	5	2		6	4
Permitted Phases		4			6		6
Detector Phase	4	5	5	2	6	6	4
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	7.0
Minimum Split (s)	13.4	13.6	13.6	18.4	18.5	18.5	13.4
Total Split (s)	31.0	17.0	17.0	59.0	42.0	42.0	31.0
Total Split (%)	34.4%	18.9%	18.9%	65.6%	46.7%	46.7%	34.4%
Maximum Green (s)	24.6	10.4	10.4	52.6	35.5	35.5	24.6
Yellow Time (s)	4.7	3.0	3.0	4.4	4.6	4.6	4.7
All-Red Time (s)	1.7	3.6	3.6	2.0	1.9	1.9	1.7
Lost Time Adjust (s)	-1.4	-1.6	-1.6	-1.4	-1.5	-1.5	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	6.0	6.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0

Liberty Classical Academy  
 3: Providence Road S & Rae Road

04/25/2023

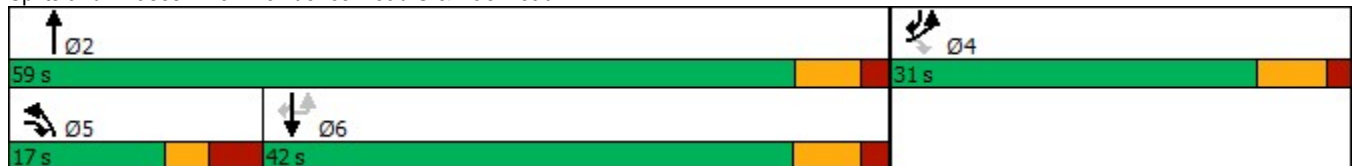


Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	30.0	30.0	30.0	0.0
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	26.0	43.0	12.0	54.0	37.0	37.0	68.0
Actuated g/C Ratio	0.29	0.48	0.13	0.60	0.41	0.41	0.76
v/c Ratio	1.06	0.34	1.02	0.63	0.03	1.01	0.42
Control Delay	89.5	16.2	87.6	13.2	16.5	63.6	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.5	16.2	87.6	13.2	16.5	63.6	5.2
LOS	F	B	F	B	B	E	A
Approach Delay	66.1			32.5		40.4	
Approach LOS	E			C		D	
Queue Length 50th (ft)	~345	87	~141	233	1	~443	83
Queue Length 95th (ft)	#495	142	#241	293	8	#677	120
Internal Link Dist (ft)	1291			991		2757	
Turn Bay Length (ft)				450		325	
Base Capacity (vph)	516	763	455	2113	155	769	1202
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.06	0.34	1.02	0.63	0.03	1.01	0.42

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Natural Cycle: 110  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.06  
 Intersection Signal Delay: 42.1      Intersection LOS: D  
 Intersection Capacity Utilization 86.6%      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: 3: Providence Road S & Rae Road



Intersection												
Int Delay, s/veh	773.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↖	↗		↕			↕	
Traffic Vol, veh/h	6	459	179	45	847	9	179	4	45	6	4	12
Future Vol, veh/h	6	459	179	45	847	9	179	4	45	6	4	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	125	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	50	50	89	90	50	50	50	90	50	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	510	358	90	952	10	358	8	90	7	8	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	962	0	0	868	0	0	1851	1845	689	1884	2014	952
Stage 1	-	-	-	-	-	-	703	703	-	1132	1132	-
Stage 2	-	-	-	-	-	-	1148	1142	-	752	882	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	715	-	-	776	-	-	~57	75	446	54	59	315
Stage 1	-	-	-	-	-	-	428	440	-	247	278	-
Stage 2	-	-	-	-	-	-	~242	275	-	402	364	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	715	-	-	776	-	-	~38	56	446	31	44	315
Mov Cap-2 Maneuver	-	-	-	-	-	-	~38	56	-	31	44	-
Stage 1	-	-	-	-	-	-	424	436	-	245	209	-
Stage 2	-	-	-	-	-	-	~167	206	-	312	360	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.9			\$ 4081.2			99.3		
HCM LOS							F			F		

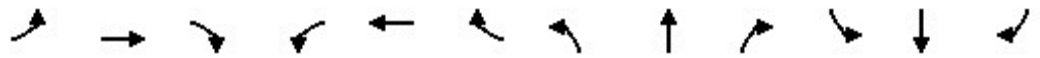
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	47	715	-	-	776	-	-	64
HCM Lane V/C Ratio	9.702	0.009	-	-	0.116	-	-	0.438
HCM Control Delay (s)	\$ 4081.2	10.1	-	-	10.2	0	-	99.3
HCM Lane LOS	F	B	-	-	B	A	-	F
HCM 95th %tile Q(veh)	54.3	0	-	-	0.4	-	-	1.7

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

Liberty Classical Academy

1: Providence Road S & Church Parking Lot/Weddington Road

04/25/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↙	↘	↗	↖	↑↑	↗	↖↖	↗↖	
Traffic Volume (vph)	7	12	4	376	4	494	4	953	450	586	1025	4
Future Volume (vph)	7	12	4	376	4	494	4	953	450	586	1025	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			1%			-5%			5%	
Storage Length (ft)	0		0	550		325	550		450	450		0
Storage Lanes	0		0	1		1	1		1	2		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	0.97	0.95	0.95
Fr <sub>t</sub>		0.978				0.850			0.850		0.999	
Fl <sub>t</sub> Protected		0.984		0.950	0.953		0.950			0.950		
Satd. Flow (prot)	0	1837	0	1673	1678	1575	1814	3628	1623	3347	3447	0
Fl <sub>t</sub> Permitted		0.804		0.950	0.953		0.950			0.950		
Satd. Flow (perm)	0	1501	0	1673	1678	1575	1814	3628	1623	3347	3447	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		1005			826			1141			1010	
Travel Time (s)		27.4			16.1			22.2			19.7	
Peak Hour Factor	0.90	0.90	0.90	0.85	0.90	0.84	0.90	0.89	0.85	0.85	0.90	0.90
Adj. Flow (vph)	8	13	4	442	4	588	4	1071	529	689	1139	4
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	25	0	221	225	588	4	1071	529	689	1143	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.97	0.97	0.97	1.01	1.01	1.01	0.97	0.97	0.97	1.03	1.03	1.03
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases		4		3	3	1	5	2	3	1	6	
Permitted Phases	4					3			2			
Detector Phase	4	4		3	3	1	5	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	
Minimum Split (s)	13.7	13.7		13.6	13.6	13.4	13.4	19.1	13.6	13.4	17.6	
Total Split (s)	13.7	13.7		25.0	25.0	35.0	13.4	46.3	25.0	35.0	67.9	
Total Split (%)	11.4%	11.4%		20.8%	20.8%	29.2%	11.2%	38.6%	20.8%	29.2%	56.6%	
Maximum Green (s)	7.0	7.0		18.4	18.4	28.6	7.0	39.2	18.4	28.6	62.3	
Yellow Time (s)	3.5	3.5		3.8	3.8	3.0	3.1	5.0	3.8	3.0	4.1	
All-Red Time (s)	3.2	3.2		2.8	2.8	3.4	3.3	2.1	2.8	3.4	1.5	
Lost Time Adjust (s)		-1.7		-1.6	-1.6	-1.4	-1.4	-2.1	-1.6	-1.4	-0.6	
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?	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	6.0	2.0	2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	

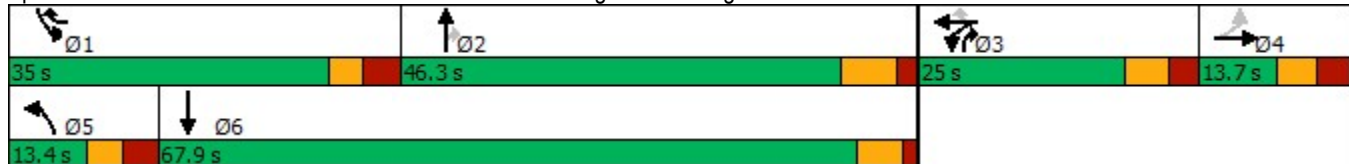


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	15.0	0.0	0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	
Recall Mode	None	None		None	None	None	None	Min	None	None	Min	
Walk Time (s)	4.0	4.0					4.0	4.0			4.0	
Flash Dont Walk (s)	25.0	25.0					27.0	33.0			12.0	
Pedestrian Calls (#/hr)	0	0					0	0			0	
Act Effct Green (s)		9.1		18.2	18.2	47.7	8.8	36.1	59.5	26.8	65.8	
Actuated g/C Ratio		0.09		0.18	0.18	0.46	0.08	0.35	0.57	0.26	0.63	
v/c Ratio		0.19		0.75	0.77	0.81	0.03	0.85	0.57	0.80	0.52	
Control Delay		55.4		61.3	62.2	33.4	52.5	40.5	18.6	45.9	13.4	
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		55.4		61.3	62.2	33.4	52.5	40.5	18.6	45.9	13.4	
LOS		E		E	E	C	D	D	B	D	B	
Approach Delay		55.4			45.6			33.3			25.7	
Approach LOS		E			D			C			C	
Queue Length 50th (ft)		19		174	177	295	3	403	260	260	235	
Queue Length 95th (ft)		48		#275	#312	#401	15	485	338	309	391	
Internal Link Dist (ft)		925			746			1061			930	
Turn Bay Length (ft)				550		325	550		450	450		
Base Capacity (vph)		131		337	337	792	153	1509	971	1011	2337	
Starvation Cap Reductn		0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0		0	0	0	0	0	0	0	0	
Storage Cap Reductn		0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.19		0.66	0.67	0.74	0.03	0.71	0.54	0.68	0.49	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 103.9  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.85  
 Intersection Signal Delay: 33.1      Intersection LOS: C  
 Intersection Capacity Utilization 75.3%      ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

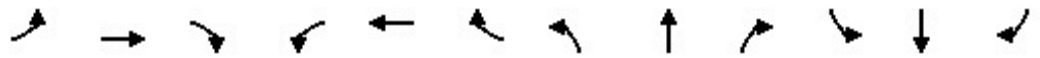
Splits and Phases: 1: Providence Road S & Church Parking Lot/Weddington Road



Liberty Classical Academy

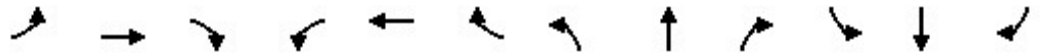
2: Providence Road S & Lenny Stadler Way/Site Access 1

04/25/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↗			↖↗	
Traffic Volume (vph)	45	4	28	17	4	39	51	1370	4	4	1352	51
Future Volume (vph)	45	4	28	17	4	39	51	1370	4	4	1352	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			1%			1%	
Storage Length (ft)	0		50	0		425	325		0	0		0
Storage Lanes	0		1	0		1	1		0	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95
Frt			0.850			0.850		0.999			0.995	
Flt Protected		0.959			0.961		0.950					
Satd. Flow (prot)	0	1777	1575	0	1790	1583	1761	3518	0	0	3504	0
Flt Permitted		0.733			0.727		0.950				0.945	
Satd. Flow (perm)	0	1359	1575	0	1354	1583	1761	3518	0	0	3311	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			10			35			35	
Link Distance (ft)		1059			785			2837			1141	
Travel Time (s)		20.6			53.5			55.3			22.2	
Peak Hour Factor	0.90	0.50	0.90	0.50	0.50	0.50	0.90	0.89	0.50	0.50	0.89	0.90
Adj. Flow (vph)	50	8	31	34	8	78	57	1539	8	8	1519	57
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	58	31	0	42	78	57	1547	0	0	1584	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	Prot	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8		8				6		
Detector Phase	4	4	5	8	8	8	5	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	10.0		10.0	10.0	
Minimum Split (s)	12.4	12.4	12.3	20.0	20.0	20.0	12.3	15.3		36.3	36.3	
Total Split (s)	20.0	20.0	12.3	20.0	20.0	20.0	12.3	70.0		57.7	57.7	
Total Split (%)	22.2%	22.2%	13.7%	22.2%	22.2%	22.2%	13.7%	77.8%		64.1%	64.1%	
Maximum Green (s)	14.6	14.6	7.0	13.0	13.0	13.0	7.0	64.7		52.4	52.4	
Yellow Time (s)	3.0	3.0	3.0	5.0	5.0	5.0	3.0	3.8		3.8	3.8	
All-Red Time (s)	2.4	2.4	2.3	2.0	2.0	2.0	2.3	1.5		1.5	1.5	
Lost Time Adjust (s)		-2.0	-0.3		-2.0	-2.0	-0.3	-0.3			-0.3	
Total Lost Time (s)		3.4	5.0		5.0	5.0	5.0	5.0			5.0	
Lead/Lag			Lead				Lead			Lag		Lag
Lead-Lag Optimize?			Yes				Yes			Yes		Yes
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Min		Min	Min	





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										24.0	24.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		13.2	17.5		12.5	12.5	8.4	53.9				45.1
Actuated g/C Ratio		0.19	0.25		0.18	0.18	0.12	0.77				0.65
v/c Ratio		0.23	0.08		0.17	0.28	0.27	0.57				0.74
Control Delay		32.4	22.2		32.9	34.0	39.5	6.0				15.6
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0				0.0
Total Delay		32.4	22.2		32.9	34.0	39.5	6.0				15.6
LOS		C	C		C	C	D	A				B
Approach Delay		28.8			33.6			7.2				15.6
Approach LOS		C			C			A				B
Queue Length 50th (ft)		23	10		17	33	25	152				304
Queue Length 95th (ft)		34	33		28	43	70	239				439
Internal Link Dist (ft)		979			705			2757				1061
Turn Bay Length (ft)			50			425	325					
Base Capacity (vph)		373	395		335	392	212	3050				2452
Starvation Cap Reductn		0	0		0	0	0	0				0
Spillback Cap Reductn		0	0		0	0	0	0				0
Storage Cap Reductn		0	0		0	0	0	0				0
Reduced v/c Ratio		0.16	0.08		0.13	0.20	0.27	0.51				0.65

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	69.6
Natural Cycle:	80
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.74
Intersection Signal Delay:	12.6
Intersection LOS:	B
Intersection Capacity Utilization:	63.3%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 2: Providence Road S & Lenny Stadler Way/Site Access 1



Liberty Classical Academy  
3: Providence Road S & Rae Road

04/25/2023



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	559	342	244	843	4	941	425
Future Volume (vph)	559	342	244	843	4	941	425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-2%			1%		-1%	
Storage Length (ft)	0	0	450		325		0
Storage Lanes	1	1	2		1		1
Taper Length (ft)	100		100		100		
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00	1.00
Fr <sub>t</sub>		0.850					0.850
Fl <sub>t</sub> Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1787	1599	3416	3522	1778	1872	1591
Fl <sub>t</sub> Permitted	0.950		0.950		0.302		
Satd. Flow (perm)	1787	1599	3416	3522	565	1872	1591
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	45			45		45	
Link Distance (ft)	1371			1071		2837	
Travel Time (s)	20.8			16.2		43.0	
Peak Hour Factor	0.88	0.90	0.90	0.89	0.90	0.89	0.86
Adj. Flow (vph)	635	380	271	947	4	1057	494
Shared Lane Traffic (%)							
Lane Group Flow (vph)	635	380	271	947	4	1057	494
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	R NA	Left	Right
Median Width(ft)	12			24		24	
Link Offset(ft)	0			0		0	
Crosswalk Width(ft)	16			16		16	
Two way Left Turn Lane							
Headway Factor	0.99	0.99	1.01	1.01	0.99	0.99	0.99
Turning Speed (mph)	15	9	15		9		9
Turn Type	Prot	pm+ov	Prot	NA	Perm	NA	pm+ov
Protected Phases	4	5	5	2		6	4
Permitted Phases		4			6		6
Detector Phase	4	5	5	2	6	6	4
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	7.0
Minimum Split (s)	13.4	13.6	13.6	18.4	18.5	18.5	13.4
Total Split (s)	30.0	13.6	13.6	60.0	46.4	46.4	30.0
Total Split (%)	33.3%	15.1%	15.1%	66.7%	51.6%	51.6%	33.3%
Maximum Green (s)	23.6	7.0	7.0	53.6	39.9	39.9	23.6
Yellow Time (s)	4.7	3.0	3.0	4.4	4.6	4.6	4.7
All-Red Time (s)	1.7	3.6	3.6	2.0	1.9	1.9	1.7
Lost Time Adjust (s)	-1.4	-1.6	-1.6	-1.4	-1.5	-1.5	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	6.0	6.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0

Liberty Classical Academy  
 3: Providence Road S & Rae Road

04/25/2023

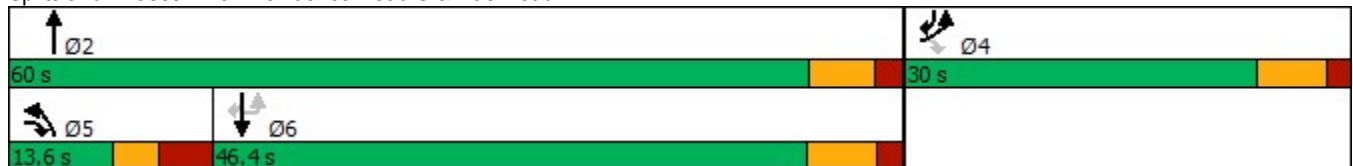


Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	30.0	30.0	30.0	0.0
Recall Mode	None	None	None	Min	Min	Min	None
Act Effct Green (s)	25.0	38.6	8.6	55.0	41.4	41.4	71.4
Actuated g/C Ratio	0.28	0.43	0.10	0.61	0.46	0.46	0.79
v/c Ratio	1.28	0.55	0.83	0.44	0.02	1.23	0.39
Control Delay	171.3	23.1	62.4	10.1	13.5	138.0	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	171.3	23.1	62.4	10.1	13.5	138.0	3.8
LOS	F	C	E	B	B	F	A
Approach Delay	115.8			21.8		95.1	
Approach LOS	F			C		F	
Queue Length 50th (ft)	~462	157	79	137	1	~749	63
Queue Length 95th (ft)	#646	247	#144	175	7	#970	90
Internal Link Dist (ft)	1291			991		2757	
Turn Bay Length (ft)			450		325		
Base Capacity (vph)	496	685	326	2152	259	861	1262
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.28	0.55	0.83	0.44	0.02	1.23	0.39

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Natural Cycle: 120  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.28  
 Intersection Signal Delay: 77.1      Intersection LOS: E  
 Intersection Capacity Utilization 100.0%      ICU Level of Service F  
 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: 3: Providence Road S & Rae Road



Intersection												
Int Delay, s/veh	346.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	751	126	31	615	12	126	4	31	13	4	12
Future Vol, veh/h	13	751	126	31	615	12	126	4	31	13	4	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	125	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	89	50	50	90	90	50	50	50	90	50	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	844	252	62	683	13	252	8	62	14	8	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	696	0	0	1096	0	0	1822	1818	970	1840	1931	683
Stage 1	-	-	-	-	-	-	998	998	-	807	807	-
Stage 2	-	-	-	-	-	-	824	820	-	1033	1124	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	900	-	-	637	-	-	~ 60	78	307	58	66	449
Stage 1	-	-	-	-	-	-	294	322	-	375	394	-
Stage 2	-	-	-	-	-	-	367	389	-	281	281	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	900	-	-	637	-	-	~ 45	65	307	36	55	449
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 45	65	-	36	55	-
Stage 1	-	-	-	-	-	-	289	317	-	369	331	-
Stage 2	-	-	-	-	-	-	292	327	-	215	277	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.9	\$ 2382.4	123.3
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	54	900	-	-	637	-	-	62
HCM Lane V/C Ratio	5.963	0.016	-	-	0.097	-	-	0.577
HCM Control Delay (s)	\$ 2382.4	9.1	-	-	11.3	0	-	123.3
HCM Lane LOS	F	A	-	-	B	A	-	F
HCM 95th %tile Q(veh)	36.8	0	-	-	0.3	-	-	2.4

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

Intersection: 1: Providence Road S & Church Parking Lot/Weddington Road

Movement	EB	WB	WB	WB	B5	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	L	LT	R	T	L	T	T	R	L	L	T
Maximum Queue (ft)	156	380	521	418	14	293	932	941	548	320	263	242
Average Queue (ft)	91	198	262	288	2	56	657	674	386	242	198	134
95th Queue (ft)	155	446	589	487	27	303	1073	1088	728	330	279	224
Link Distance (ft)	948		728		866		1068	1068				945
Upstream Blk Time (%)			1				1	2				
Queuing Penalty (veh)			8				13	15				
Storage Bay Dist (ft)		550		325		550			450	450	450	
Storage Blk Time (%)		0	1	18			24	40				
Queuing Penalty (veh)		0	10	114			5	154				

Intersection: 1: Providence Road S & Church Parking Lot/Weddington Road

Movement	SB
Directions Served	TR
Maximum Queue (ft)	240
Average Queue (ft)	133
95th Queue (ft)	230
Link Distance (ft)	945
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Providence Road S & Lenny Stadler Way/Site Access 1

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LT	R	LT	R	L	T	TR	LT	TR
Maximum Queue (ft)	105	50	49	35	160	918	931	628	632
Average Queue (ft)	46	19	13	9	71	229	257	367	371
95th Queue (ft)	97	48	42	32	161	924	943	748	757
Link Distance (ft)	1008					2759	2759	1068	1068
Upstream Blk Time (%)						1	1	0	1
Queuing Penalty (veh)						8	8	2	4
Storage Bay Dist (ft)		50		425	325				
Storage Blk Time (%)	20	4				7			
Queuing Penalty (veh)	7	2				7			

Intersection: 3: Providence Road S & Rae Road

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	T	U	T	R
Maximum Queue (ft)	942	291	322	383	349	313	147	834	538
Average Queue (ft)	616	100	231	273	163	161	15	523	153
95th Queue (ft)	1026	276	359	415	321	303	128	941	498
Link Distance (ft)	1322	1322			1034	1034		2759	2759
Upstream Blk Time (%)					0	0			
Queuing Penalty (veh)					0	0			
Storage Bay Dist (ft)			450	450			325		
Storage Blk Time (%)			0	1	1			35	
Queuing Penalty (veh)			0	4	3			1	

Intersection: 4: Site Access 2/Wheatberry Hill Drive & Weddington Road

Movement	EB	EB	B5	B5	WB	WB	NB	SB
Directions Served	L	TR	T		LT	R	LTR	LTR
Maximum Queue (ft)	24	694	464	319	1176	88	1043	258
Average Queue (ft)	3	109	60	31	841	7	955	143
95th Queue (ft)	19	561	360	253	1518	73	1266	288
Link Distance (ft)		866	728	728	1180		1001	954
Upstream Blk Time (%)		6	1	0	31		71	
Queuing Penalty (veh)		59	3	2	0		319	
Storage Bay Dist (ft)	125					125		
Storage Blk Time (%)			11		47			
Queuing Penalty (veh)			1		5			

Zone Summary

Zone wide Queuing Penalty: 756
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Intersection: 1: Providence Road S & Church Parking Lot/Weddington Road

Movement	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LTR	L	LT	R	L	T	T	R	L	L	T	TR
Maximum Queue (ft)	60	189	262	362	23	411	414	338	333	268	206	228
Average Queue (ft)	21	101	125	190	3	259	269	193	232	183	100	116
95th Queue (ft)	55	177	252	363	18	388	395	334	328	276	195	217
Link Distance (ft)	948		728			1068	1068				945	945
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		550		325	550			450	450	450		
Storage Blk Time (%)			0	3			0	0				
Queuing Penalty (veh)			1	13			1	1				

Intersection: 2: Providence Road S & Lenny Stadler Way/Site Access 1

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LT	R	LT	R	L	T	TR	LT	TR
Maximum Queue (ft)	88	58	56	88	72	157	178	342	358
Average Queue (ft)	36	19	14	21	34	65	95	169	168
95th Queue (ft)	77	49	48	71	69	140	179	360	359
Link Distance (ft)	1008		721			2759	2759	1068	1068
Upstream Blk Time (%)									0
Queuing Penalty (veh)									0
Storage Bay Dist (ft)		50		425	325				
Storage Blk Time (%)	10	2							
Queuing Penalty (veh)	3	1							

Intersection: 3: Providence Road S & Rae Road

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	T	U	T	R
Maximum Queue (ft)	1339	1294	197	231	183	176	184	2733	2715
Average Queue (ft)	1166	879	111	157	107	104	17	2122	1716
95th Queue (ft)	1618	1813	205	222	169	175	143	3015	2949
Link Distance (ft)	1322	1322			1034	1034		2759	2759
Upstream Blk Time (%)	51	37						4	0
Queuing Penalty (veh)	0	0						30	3
Storage Bay Dist (ft)			450	450			325		
Storage Blk Time (%)								60	
Queuing Penalty (veh)								2	

Intersection: 4: Site Access 2/Wheatberry Hill Drive & Weddington Road

Movement	EB	EB	B5	WB	WB	NB	SB
Directions Served	L	TR	T	LT	R	LTR	LTR
Maximum Queue (ft)	26	23	214	935	179	1050	244
Average Queue (ft)	5	5	23	407	12	938	138
95th Queue (ft)	22	19	228	1015	95	1268	327
Link Distance (ft)		866	728	1180		1001	954
Upstream Blk Time (%)			0	3		72	
Queuing Penalty (veh)			0	0		227	
Storage Bay Dist (ft)	125				125		
Storage Blk Time (%)				30			
Queuing Penalty (veh)				4			

Zone Summary

Zone wide Queuing Penalty: 288

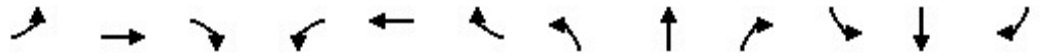


## **2026 Build + Improvements Traffic Volumes**

Liberty Classical Academy

2: Providence Road S & Lenny Stadler Way/Site Access 1

04/20/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↕		↖	↕	
Traffic Volume (vph)	41	4	30	4	4	4	79	1412	23	55	1073	64
Future Volume (vph)	41	4	30	4	4	4	79	1412	23	55	1073	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			1%			1%	
Storage Length (ft)	0		50	0		425	325		100	100		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Fr <sub>t</sub>			0.850			0.850		0.996			0.992	
Fl <sub>t</sub> Protected		0.959			0.976		0.950			0.950		
Satd. Flow (prot)	0	1777	1575	0	1818	1583	1761	3507	0	1761	3493	0
Fl <sub>t</sub> Permitted		0.746			0.814		0.159			0.146		
Satd. Flow (perm)	0	1383	1575	0	1516	1583	295	3507	0	271	3493	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			10			35			35	
Link Distance (ft)		1059			530			2837			1141	
Travel Time (s)		20.6			36.1			55.3			22.2	
Peak Hour Factor	0.90	0.50	0.90	0.50	0.50	0.50	0.90	0.87	0.50	0.50	0.87	0.90
Adj. Flow (vph)	46	8	33	8	8	8	88	1623	46	110	1233	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	54	33	0	16	8	88	1669	0	110	1304	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	D.P+P	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8		8	6			6		
Detector Phase	4	4	5	8	8	8	5	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	10.0		10.0	10.0	
Minimum Split (s)	12.4	12.4	12.3	20.0	20.0	20.0	12.3	15.3		36.3	36.3	
Total Split (s)	20.0	20.0	12.3	20.0	20.0	20.0	12.3	70.0		57.7	57.7	
Total Split (%)	22.2%	22.2%	13.7%	22.2%	22.2%	22.2%	13.7%	77.8%		64.1%	64.1%	
Maximum Green (s)	14.6	14.6	7.0	13.0	13.0	13.0	7.0	64.7		52.4	52.4	
Yellow Time (s)	3.0	3.0	3.0	5.0	5.0	5.0	3.0	3.8		3.8	3.8	
All-Red Time (s)	2.4	2.4	2.3	2.0	2.0	2.0	2.3	1.5		1.5	1.5	
Lost Time Adjust (s)		-2.0	-0.3		-2.0	-2.0	-0.3	-0.3		-2.0	-0.3	
Total Lost Time (s)		3.4	5.0		5.0	5.0	5.0	5.0		3.3	5.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Min		Min	Min	

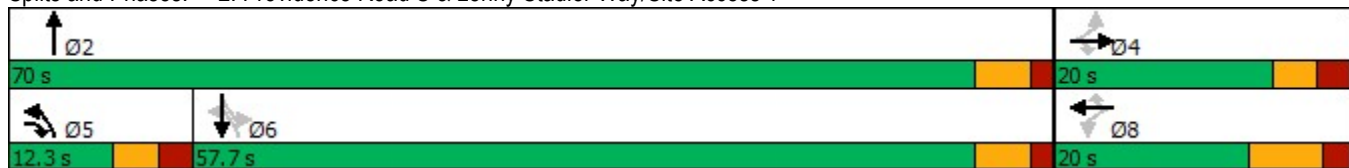


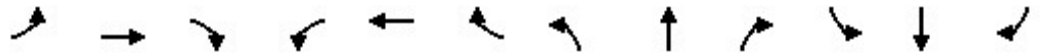
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										24.0	24.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		11.4	15.5		10.6	10.6	51.3	58.3		49.0	47.7	
Actuated g/C Ratio		0.17	0.23		0.16	0.16	0.76	0.86		0.72	0.70	
v/c Ratio		0.23	0.09		0.07	0.03	0.22	0.55		0.56	0.53	
Control Delay		34.7	24.1		34.2	33.5	3.9	4.1		25.3	8.9	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		34.7	24.1		34.2	33.5	3.9	4.1		25.3	8.9	
LOS		C	C		C	C	A	A		C	A	
Approach Delay		30.7			34.0			4.1			10.2	
Approach LOS		C			C			A			B	
Queue Length 50th (ft)		26	13		8	4	8	151		30	192	
Queue Length 95th (ft)		32	35		14	9	20	216		34	257	
Internal Link Dist (ft)		979			450			2757			1061	
Turn Bay Length (ft)			50			425	325			100		
Base Capacity (vph)		383	359		379	396	401	3022		213	2705	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.14	0.09		0.04	0.02	0.22	0.55		0.52	0.48	

Intersection Summary

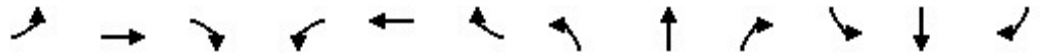
Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 67.9  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.56  
 Intersection Signal Delay: 7.7  
 Intersection Capacity Utilization 68.1%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service C

Splits and Phases: 2: Providence Road S & Lenny Stadler Way/Site Access 1





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	406	312	77	755	8	198	4	49	5	4	11
Future Volume (vph)	5	406	312	77	755	8	198	4	49	5	4	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		150	100		125	0		100	0		0
Storage Lanes	1		1	1		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.938	
Flt Protected	0.950			0.950				0.953			0.989	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	0	1775	1583	0	1728	0
Flt Permitted	0.115			0.411				0.711			0.905	
Satd. Flow (perm)	214	1863	1583	766	1863	1583	0	1324	1583	0	1581	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			10			25	
Link Distance (ft)		934			1208			1091			997	
Travel Time (s)		18.2			23.5			74.4			27.2	
Peak Hour Factor	0.90	0.90	0.50	0.50	0.89	0.90	0.50	0.50	0.50	0.90	0.50	0.90
Adj. Flow (vph)	6	451	624	154	848	9	396	8	98	6	8	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	6	451	624	154	848	9	0	404	98	0	26	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Free	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		Free	6		6	8		8	4		
Detector Phase	2	2		6	6	6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	17.0	17.0		17.0	17.0	17.0	14.0	14.0	14.0	14.0	14.0	
Total Split (s)	45.0	45.0		45.0	45.0	45.0	30.0	30.0	30.0	30.0	30.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%	60.0%	40.0%	40.0%	40.0%	40.0%	40.0%	
Maximum Green (s)	38.0	38.0		38.0	38.0	38.0	23.0	23.0	23.0	23.0	23.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0		-2.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	
Recall Mode	Min	Min		Min	Min	Min	None	None	None	None	None	
Act Effect Green (s)	35.0	35.0	69.1	35.0	35.0	35.0		23.9	23.9		23.9	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.51	0.51	1.00	0.51	0.51	0.51		0.35	0.35		0.35	
v/c Ratio	0.06	0.48	0.39	0.40	0.90	0.01		0.88	0.18		0.05	
Control Delay	10.0	13.0	0.7	14.2	30.0	8.4		46.5	18.6		17.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	10.0	13.0	0.7	14.2	30.0	8.4		46.5	18.6		17.2	
LOS	A	B	A	B	C	A		D	B		B	
Approach Delay		5.9			27.4			41.1			17.3	
Approach LOS		A			C			D			B	
Queue Length 50th (ft)	1	120	0	39	314	2		178	32		8	
Queue Length 95th (ft)	7	189	0	37	#546	8		127	35		13	
Internal Link Dist (ft)		854			1128			1011			917	
Turn Bay Length (ft)	125		150	100		125			100			
Base Capacity (vph)	126	1098	1583	451	1098	933		488	583		583	
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	
Reduced v/c Ratio	0.05	0.41	0.39	0.34	0.77	0.01		0.83	0.17		0.04	

Intersection Summary

Area Type: Other  
 Cycle Length: 75  
 Actuated Cycle Length: 69.1  
 Natural Cycle: 75  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 21.1  
 Intersection LOS: C  
 Intersection Capacity Utilization 78.4%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

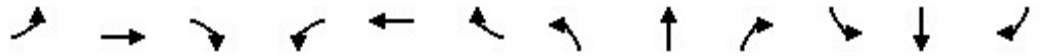
Splits and Phases: 4: Site Access 2/Wheatberry Hill Drive & Weddington Road



Liberty Classical Academy

2: Providence Road S & Lenny Stadler Way/Site Access 1

04/26/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↕		↖	↕	
Traffic Volume (vph)	40	4	25	23	4	55	45	1228	4	4	1264	45
Future Volume (vph)	40	4	25	23	4	55	45	1228	4	4	1264	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			1%			1%	
Storage Length (ft)	0		50	0		425	325		100	100		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850			0.850		0.999			0.995	
Flt Protected		0.959			0.959		0.950			0.950		
Satd. Flow (prot)	0	1777	1575	0	1786	1583	1761	3518	0	1761	3504	0
Flt Permitted		0.745			0.721		0.097			0.190		
Satd. Flow (perm)	0	1381	1575	0	1343	1583	180	3518	0	352	3504	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			10			35			35	
Link Distance (ft)		1059			530			2837			1141	
Travel Time (s)		20.6			36.1			55.3			22.2	
Peak Hour Factor	0.90	0.50	0.90	0.50	0.50	0.50	0.90	0.88	0.50	0.50	0.86	0.90
Adj. Flow (vph)	44	8	28	46	8	110	50	1395	8	8	1470	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	52	28	0	54	110	50	1403	0	8	1520	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	D.P+P	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8		8	6			6		
Detector Phase	4	4	5	8	8	8	5	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	10.0		10.0	10.0	
Minimum Split (s)	12.4	12.4	12.3	20.0	20.0	20.0	12.3	15.3		36.3	36.3	
Total Split (s)	20.0	20.0	12.3	20.0	20.0	20.0	12.3	70.0		57.7	57.7	
Total Split (%)	22.2%	22.2%	13.7%	22.2%	22.2%	22.2%	13.7%	77.8%		64.1%	64.1%	
Maximum Green (s)	14.6	14.6	7.0	13.0	13.0	13.0	7.0	64.7		52.4	52.4	
Yellow Time (s)	3.0	3.0	3.0	5.0	5.0	5.0	3.0	3.8		3.8	3.8	
All-Red Time (s)	2.4	2.4	2.3	2.0	2.0	2.0	2.3	1.5		1.5	1.5	
Lost Time Adjust (s)		-2.0	-0.3		-2.0	-2.0	-0.3	-0.3		-2.0	-0.3	
Total Lost Time (s)		3.4	5.0		5.0	5.0	5.0	5.0		3.3	5.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Min		Min	Min	

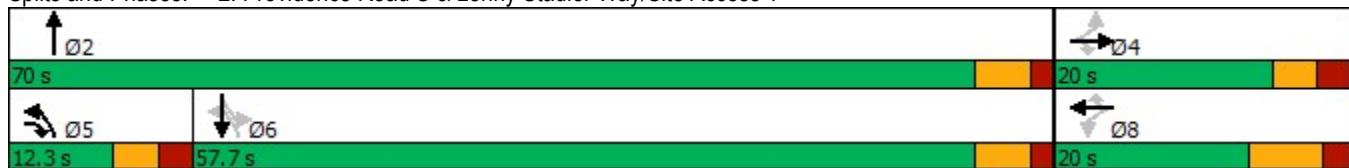


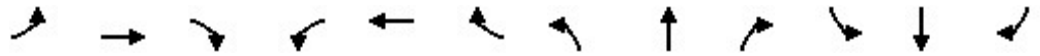
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										24.0	24.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		13.6	17.7		13.2	13.2	45.6	50.0		45.3	44.0	
Actuated g/C Ratio		0.20	0.26		0.20	0.20	0.68	0.75		0.68	0.66	
v/c Ratio		0.19	0.07		0.20	0.35	0.16	0.53		0.03	0.66	
Control Delay		30.3	21.0		31.9	33.6	5.0	6.2		8.0	13.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		30.3	21.0		31.9	33.6	5.0	6.2		8.0	13.1	
LOS		C	C		C	C	A	A		A	B	
Approach Delay		27.0			33.0			6.2			13.1	
Approach LOS		C			C			A			B	
Queue Length 50th (ft)		20	9		22	46	6	141		2	282	
Queue Length 95th (ft)		31	31		33	57	16	199		4	360	
Internal Link Dist (ft)		979			450			2757			1061	
Turn Bay Length (ft)			50			425	325			100		
Base Capacity (vph)		393	415		345	407	320	3076		280	2737	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.13	0.07		0.16	0.27	0.16	0.46		0.03	0.56	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	66.9
Natural Cycle:	70
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.66
Intersection Signal Delay:	11.3
Intersection LOS:	B
Intersection Capacity Utilization:	60.5%
ICU Level of Service:	B
Analysis Period (min):	15

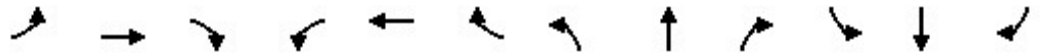
Splits and Phases: 2: Providence Road S & Lenny Stadler Way/Site Access 1





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	670	154	38	544	11	295	4	73	12	4	11
Future Volume (vph)	12	670	154	38	544	11	295	4	73	12	4	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		150	100		125	0		100	0		0
Storage Lanes	1		1	1		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.951	
Flt Protected	0.950			0.950				0.953			0.981	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	0	1775	1583	0	1738	0
Flt Permitted	0.197			0.120				0.705			0.812	
Satd. Flow (perm)	367	1863	1583	224	1863	1583	0	1313	1583	0	1438	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35		35				10			25	
Link Distance (ft)		934		1208				1091			997	
Travel Time (s)		18.2		23.5				74.4			27.2	
Peak Hour Factor	0.90	0.89	0.50	0.50	0.90	0.90	0.50	0.50	0.50	0.90	0.50	0.90
Adj. Flow (vph)	13	753	308	76	604	12	590	8	146	13	8	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	753	308	76	604	12	0	598	146	0	33	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Free	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		Free	6		6	8		8	4		
Detector Phase	2	2		6	6	6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	19.0	19.0		19.0	19.0	19.0	14.0	14.0	14.0	14.0	14.0	
Total Split (s)	39.0	39.0		39.0	39.0	39.0	41.0	41.0	41.0	41.0	41.0	
Total Split (%)	48.8%	48.8%		48.8%	48.8%	48.8%	51.3%	51.3%	51.3%	51.3%	51.3%	
Maximum Green (s)	32.0	32.0		32.0	32.0	32.0	34.0	34.0	34.0	34.0	34.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0		-2.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	
Recall Mode	Min	Min		Min	Min	Min	None	None	None	None	None	
Act Effect Green (s)	33.3	33.3	79.3	33.3	33.3	33.3		36.0	36.0		36.0	



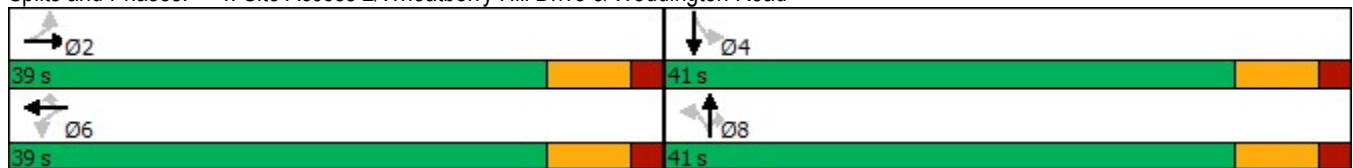


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.42	0.42	1.00	0.42	0.42	0.42		0.45	0.45		0.45	
v/c Ratio	0.08	0.96	0.19	0.81	0.77	0.02		1.00	0.20		0.05	
Control Delay	15.7	49.0	0.3	79.8	28.0	13.5		62.5	14.2		12.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	15.7	49.0	0.3	79.8	28.0	13.5		62.5	14.2		12.8	
LOS	B	D	A	E	C	B		E	B		B	
Approach Delay		34.7			33.4			53.0				12.8
Approach LOS		C			C			D				B
Queue Length 50th (ft)	4	352	0	32	249	3		~297	42		9	
Queue Length 95th (ft)	15	#575	0	39	380	13		171	41		13	
Internal Link Dist (ft)		854			1128			1011			917	
Turn Bay Length (ft)	125		150	100		125			100			
Base Capacity (vph)	157	799	1583	96	799	679		596	719		653	
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	
Reduced v/c Ratio	0.08	0.94	0.19	0.79	0.76	0.02		1.00	0.20		0.05	

Intersection Summary

Area Type: Other  
 Cycle Length: 80  
 Actuated Cycle Length: 79.3  
 Natural Cycle: 80  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.00  
 Intersection Signal Delay: 39.4  
 Intersection LOS: D  
 Intersection Capacity Utilization 66.8%  
 ICU Level of Service C  
 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: 4: Site Access 2/Wheatberry Hill Drive & Weddington Road



Intersection: 2: Providence Road S & Lenny Stadler Way/Site Access 1

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	LT	R	LT	R	L	T	TR	L	T	TR	
Maximum Queue (ft)	75	55	35	31	70	180	212	159	212	214	
Average Queue (ft)	34	20	13	7	35	79	110	73	97	94	
95th Queue (ft)	71	50	37	29	67	167	209	146	195	198	
Link Distance (ft)	1008						2759	2759	1067		1067
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	50		425		325		100				
Storage Blk Time (%)	9	4					11	4			
Queuing Penalty (veh)	3	2					67	4			

Intersection: 4: Site Access 2/Wheatberry Hill Drive & Weddington Road

Movement	EB	EB	EB	B5	B5	WB	WB	WB	NB	NB	SB
Directions Served	L	T	R	T		L	T	R	LT	R	LTR
Maximum Queue (ft)	26	243	238	516	135	200	588	116	292	188	51
Average Queue (ft)	6	110	126	71	12	95	274	11	181	74	15
95th Queue (ft)	23	213	239	402	159	210	535	89	284	170	45
Link Distance (ft)	866		728		728	1166		1004		954	
Upstream Blk Time (%)	0				0						
Queuing Penalty (veh)					1	0					
Storage Bay Dist (ft)	125	150				100	125		100		
Storage Blk Time (%)	4		5			2	28	27		1	
Queuing Penalty (veh)	24		23			17	46	26		3	

Zone Summary

Zone wide Queuing Penalty: 216

Intersection: 2: Providence Road S & Lenny Stadler Way/Site Access 1

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	90	52	82	108	70	158	182	42	284	291
Average Queue (ft)	39	16	35	57	29	84	116	6	150	150
95th Queue (ft)	81	46	75	101	64	155	194	37	271	269
Link Distance (ft)	1008		454			2759	2759		1067	1067
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		50		425	325			100		
Storage Blk Time (%)	11	1							11	
Queuing Penalty (veh)	3	1							1	

Intersection: 4: Site Access 2/Wheatberry Hill Drive & Weddington Road

Movement	EB	EB	EB	B5	B5	WB	WB	WB	NB	NB	SB
Directions Served	L	T	R	T		L	T	R	LT	R	LTR
Maximum Queue (ft)	147	898	250	417	218	199	426	35	439	200	52
Average Queue (ft)	22	580	204	110	43	92	238	3	310	141	18
95th Queue (ft)	104	1005	355	474	312	196	401	34	447	257	49
Link Distance (ft)		866		728	728		1166		1004		954
Upstream Blk Time (%)		9		0	0						
Queuing Penalty (veh)		108		2	1						
Storage Bay Dist (ft)	125		150			100		125		100	
Storage Blk Time (%)		45	0			14	32		43	3	
Queuing Penalty (veh)		145	0			86	28		63	19	

Zone Summary

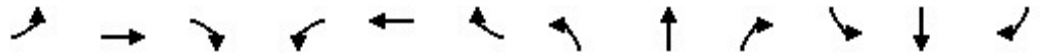
Zone wide Queuing Penalty: 458

## **2028 Build + Improvements Traffic Volumes**

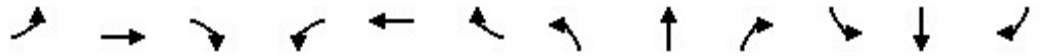
Liberty Classical Academy

2: Providence Road S & Lenny Stadler Way/Site Access 1

04/20/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↕		↖	↕	
Traffic Volume (vph)	43	4	32	4	4	4	83	1445	21	48	1134	67
Future Volume (vph)	43	4	32	4	4	4	83	1445	21	48	1134	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			1%			1%	
Storage Length (ft)	0		50	0		425	325		100	100		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Fr <sub>t</sub>			0.850			0.850		0.996			0.992	
Fl <sub>t</sub> Protected		0.959			0.976		0.950			0.950		
Satd. Flow (prot)	0	1777	1575	0	1818	1583	1761	3507	0	1761	3493	0
Fl <sub>t</sub> Permitted		0.745			0.813		0.950			0.144		
Satd. Flow (perm)	0	1381	1575	0	1514	1583	1761	3507	0	267	3493	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			10			35			35	
Link Distance (ft)		1059			530			2837			1141	
Travel Time (s)		20.6			36.1			55.3			22.2	
Peak Hour Factor	0.90	0.50	0.90	0.50	0.50	0.50	0.90	0.88	0.50	0.50	0.87	0.90
Adj. Flow (vph)	48	8	36	8	8	8	92	1642	42	96	1303	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	56	36	0	16	8	92	1684	0	96	1377	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	Prot	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8		8				6		
Detector Phase	4	4	5	8	8	8	5	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	10.0		10.0	10.0	
Minimum Split (s)	12.4	12.4	12.3	20.0	20.0	20.0	12.3	15.3		36.3	36.3	
Total Split (s)	20.0	20.0	12.4	20.0	20.0	20.0	12.4	70.0		57.6	57.6	
Total Split (%)	22.2%	22.2%	13.8%	22.2%	22.2%	22.2%	13.8%	77.8%		64.0%	64.0%	
Maximum Green (s)	14.6	14.6	7.1	13.0	13.0	13.0	7.1	64.7		52.3	52.3	
Yellow Time (s)	3.0	3.0	3.0	5.0	5.0	5.0	3.0	3.8		3.8	3.8	
All-Red Time (s)	2.4	2.4	2.3	2.0	2.0	2.0	2.3	1.5		1.5	1.5	
Lost Time Adjust (s)		-2.0	-0.3		-2.0	-2.0	-0.3	-0.3		-2.0	-0.3	
Total Lost Time (s)		3.4	5.0		5.0	5.0	5.0	5.0		3.3	5.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Min		Min	Min	

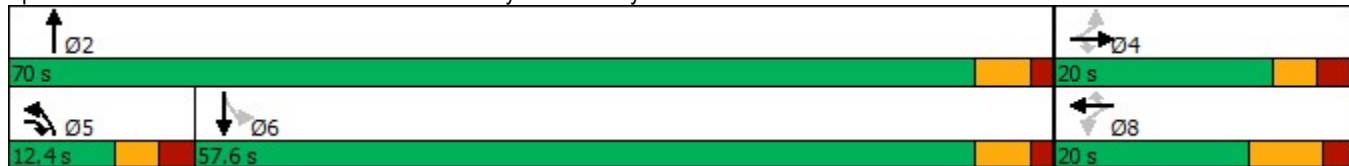


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										24.0	24.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		11.8	15.7		11.0	11.0	8.6	53.8		44.1	42.8	
Actuated g/C Ratio		0.19	0.25		0.17	0.17	0.14	0.85		0.70	0.68	
v/c Ratio		0.22	0.09		0.06	0.03	0.39	0.56		0.52	0.58	
Control Delay		32.9	22.8		33.0	32.5	40.1	4.4		22.7	10.0	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		32.9	22.8		33.0	32.5	40.1	4.4		22.7	10.0	
LOS		C	C		C	C	D	A		C	B	
Approach Delay		29.0			32.8			6.3			10.8	
Approach LOS		C			C			A			B	
Queue Length 50th (ft)		22	11		6	3	39	154		25	211	
Queue Length 95th (ft)		34	37		14	9	#115	229		29	282	
Internal Link Dist (ft)		979			450			2757			1061	
Turn Bay Length (ft)			50			425	325			100		
Base Capacity (vph)		423	392		419	438	240	3112		215	2775	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.13	0.09		0.04	0.02	0.38	0.54		0.45	0.50	

Intersection Summary

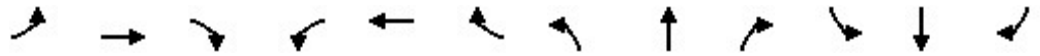
Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 63.3  
 Natural Cycle: 80  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.58  
 Intersection Signal Delay: 9.1  
 Intersection LOS: A  
 Intersection Capacity Utilization 69.0%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 2: Providence Road S & Lenny Stadler Way/Site Access 1





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	427	224	56	789	8	224	4	56	6	4	11
Future Volume (vph)	6	427	224	56	789	8	224	4	56	6	4	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		150	100		125	0		100	0		0
Storage Lanes	1		1	1		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.940	
Flt Protected	0.950			0.950				0.953			0.987	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	0	1775	1583	0	1728	0
Flt Permitted	0.102			0.383				0.710			0.890	
Satd. Flow (perm)	190	1863	1583	713	1863	1583	0	1323	1583	0	1558	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35		35				10			25	
Link Distance (ft)		934		1208				1091			997	
Travel Time (s)		18.2		23.5				74.4			27.2	
Peak Hour Factor	0.90	0.90	0.50	0.50	0.89	0.90	0.50	0.50	0.50	0.90	0.50	0.90
Adj. Flow (vph)	7	474	448	112	887	9	448	8	112	7	8	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	474	448	112	887	9	0	456	112	0	27	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Free	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		Free	6		6	8		8	4		
Detector Phase	2	2		6	6	6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	17.0	17.0		17.0	17.0	17.0	14.0	14.0	14.0	14.0	14.0	
Total Split (s)	47.0	47.0		47.0	47.0	47.0	33.0	33.0	33.0	33.0	33.0	
Total Split (%)	58.8%	58.8%		58.8%	58.8%	58.8%	41.3%	41.3%	41.3%	41.3%	41.3%	
Maximum Green (s)	40.0	40.0		40.0	40.0	40.0	26.0	26.0	26.0	26.0	26.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0		-2.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	
Recall Mode	Min	Min		Min	Min	Min	None	None	None	None	None	
Act Effct Green (s)	39.1	39.1	77.3	39.1	39.1	39.1		28.1	28.1		28.1	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.51	0.51	1.00	0.51	0.51	0.51		0.36	0.36		0.36	
v/c Ratio	0.07	0.50	0.28	0.31	0.94	0.01		0.95	0.19		0.05	
Control Delay	11.7	14.7	0.4	13.8	37.3	9.2		57.8	19.2		17.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	11.7	14.7	0.4	13.8	37.3	9.2		57.8	19.2		17.6	
LOS	B	B	A	B	D	A		E	B		B	
Approach Delay		7.8			34.4			50.2			17.6	
Approach LOS		A			C			D			B	
Queue Length 50th (ft)	2	141	0	30	377	2		222	39		9	
Queue Length 95th (ft)	9	219	0	31	#626	9		150	40		14	
Internal Link Dist (ft)		854			1128			1011			917	
Turn Bay Length (ft)	125		150	100		125			100			
Base Capacity (vph)	103	1016	1583	389	1016	863		481	575		566	
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	
Reduced v/c Ratio	0.07	0.47	0.28	0.29	0.87	0.01		0.95	0.19		0.05	

Intersection Summary

Area Type: Other  
 Cycle Length: 80  
 Actuated Cycle Length: 77.3  
 Natural Cycle: 80  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.95  
 Intersection Signal Delay: 28.0  
 Intersection LOS: C  
 Intersection Capacity Utilization 74.2%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 4: Site Access 2/Wheatberry Hill Drive & Weddington Road

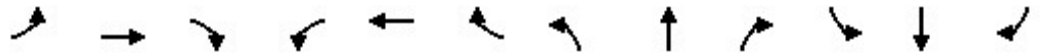




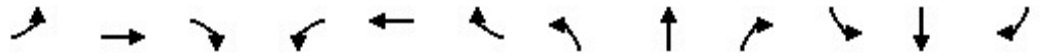
Liberty Classical Academy

2: Providence Road S & Lenny Stadler Way/Site Access 1

04/20/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↗	↕		↗	↕	
Traffic Volume (vph)	42	4	26	21	4	48	48	1288	4	4	1271	48
Future Volume (vph)	42	4	26	21	4	48	48	1288	4	4	1271	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			1%			1%	
Storage Length (ft)	0		50	0		425	325		100	100		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850			0.850		0.999			0.995	
Flt Protected		0.959			0.960		0.950			0.950		
Satd. Flow (prot)	0	1777	1575	0	1788	1583	1761	3518	0	1761	3504	0
Flt Permitted		0.739			0.722		0.950			0.174		
Satd. Flow (perm)	0	1370	1575	0	1345	1583	1761	3518	0	322	3504	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			10			35			35	
Link Distance (ft)		1059			530			2837			1141	
Travel Time (s)		20.6			36.1			55.3			22.2	
Peak Hour Factor	0.90	0.50	0.90	0.50	0.50	0.50	0.90	0.88	0.50	0.50	0.88	0.90
Adj. Flow (vph)	47	8	29	42	8	96	53	1464	8	8	1444	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	55	29	0	50	96	53	1472	0	8	1497	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	Prot	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8		8				6		
Detector Phase	4	4	5	8	8	8	5	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	10.0		10.0	10.0	
Minimum Split (s)	12.4	12.4	12.3	20.0	20.0	20.0	12.3	15.3		36.3	36.3	
Total Split (s)	20.0	20.0	12.3	20.0	20.0	20.0	12.3	70.0		57.7	57.7	
Total Split (%)	22.2%	22.2%	13.7%	22.2%	22.2%	22.2%	13.7%	77.8%		64.1%	64.1%	
Maximum Green (s)	14.6	14.6	7.0	13.0	13.0	13.0	7.0	64.7		52.4	52.4	
Yellow Time (s)	3.0	3.0	3.0	5.0	5.0	5.0	3.0	3.8		3.8	3.8	
All-Red Time (s)	2.4	2.4	2.3	2.0	2.0	2.0	2.3	1.5		1.5	1.5	
Lost Time Adjust (s)		-2.0	-0.3		-2.0	-2.0	-0.3	-0.3		-2.0	-0.3	
Total Lost Time (s)		3.4	5.0		5.0	5.0	5.0	5.0		3.3	5.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Min		Min	Min	

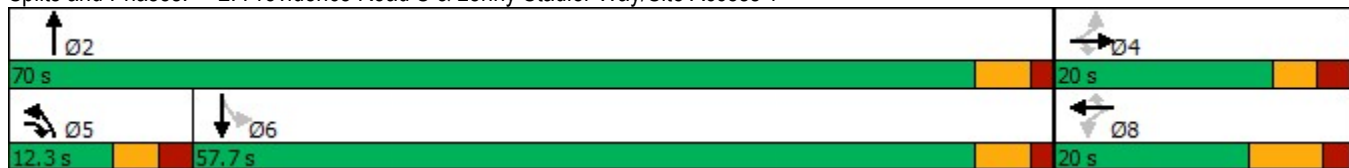


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										24.0	24.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		13.9	21.2		12.7	12.7	8.4	49.2		44.4	43.2	
Actuated g/C Ratio		0.21	0.32		0.19	0.19	0.13	0.75		0.68	0.66	
v/c Ratio		0.19	0.06		0.19	0.31	0.24	0.56		0.04	0.65	
Control Delay		29.9	20.3		31.5	32.7	37.7	6.3		8.0	12.8	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		29.9	20.3		31.5	32.7	37.7	6.3		8.0	12.8	
LOS		C	C		C	C	D	A		A	B	
Approach Delay		26.6			32.3			7.4			12.8	
Approach LOS		C			C			A			B	
Queue Length 50th (ft)		21	9		20	39	22	146		2	268	
Queue Length 95th (ft)		32	32		31	51	66	215		4	366	
Internal Link Dist (ft)		979			450			2757			1061	
Turn Bay Length (ft)			50			425	325			100		
Base Capacity (vph)		396	507		351	414	224	3109		259	2776	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.14	0.06		0.14	0.23	0.24	0.47		0.03	0.54	

Intersection Summary

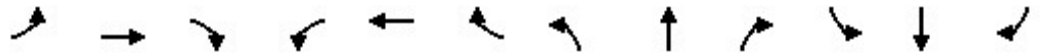
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	65.7
Natural Cycle:	70
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.65
Intersection Signal Delay:	11.5
Intersection LOS:	B
Intersection Capacity Utilization:	60.8%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 2: Providence Road S & Lenny Stadler Way/Site Access 1





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	700	157	39	571	11	157	4	39	12	4	11
Future Volume (vph)	12	700	157	39	571	11	157	4	39	12	4	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		150	100		125	0		100	0		0
Storage Lanes	1		1	1		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.951	
Flt Protected	0.950			0.950				0.954			0.981	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	0	1777	1583	0	1738	0
Flt Permitted	0.272			0.151				0.707			0.826	
Satd. Flow (perm)	507	1863	1583	281	1863	1583	0	1317	1583	0	1463	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			10			25	
Link Distance (ft)		934			1208			1091			997	
Travel Time (s)		18.2			23.5			74.4			27.2	
Peak Hour Factor	0.90	0.89	0.50	0.50	0.90	0.90	0.50	0.50	0.50	0.90	0.50	0.90
Adj. Flow (vph)	13	787	314	78	634	12	314	8	78	13	8	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	787	314	78	634	12	0	322	78	0	33	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Free	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		Free	6		6	8		8	4		
Detector Phase	2	2		6	6	6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	17.0	17.0		17.0	17.0	17.0	14.0	14.0	14.0	14.0	14.0	
Total Split (s)	37.0	37.0		37.0	37.0	37.0	23.0	23.0	23.0	23.0	23.0	
Total Split (%)	61.7%	61.7%		61.7%	61.7%	61.7%	38.3%	38.3%	38.3%	38.3%	38.3%	
Maximum Green (s)	30.0	30.0		30.0	30.0	30.0	16.0	16.0	16.0	16.0	16.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0		-2.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	
Recall Mode	Min	Min		Min	Min	Min	None	None	None	None	None	
Act Effect Green (s)	26.6	26.6	53.7	26.6	26.6	26.6		16.8	16.8		16.8	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.50	0.50	1.00	0.50	0.50	0.50		0.31	0.31		0.31	
v/c Ratio	0.05	0.85	0.20	0.57	0.69	0.02		0.78	0.16		0.07	
Control Delay	7.5	22.9	0.3	29.2	14.9	6.7		34.9	16.1		15.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	7.5	22.9	0.3	29.2	14.9	6.7		34.9	16.1		15.4	
LOS	A	C	A	C	B	A		C	B		B	
Approach Delay		16.4			16.3			31.2			15.4	
Approach LOS		B			B			C			B	
Queue Length 50th (ft)	2	209	0	17	147	2		101	19		8	
Queue Length 95th (ft)	9	#362	0	22	245	8		87	26		14	
Internal Link Dist (ft)		854			1128			1011			917	
Turn Bay Length (ft)	125		150	100		125			100			
Base Capacity (vph)	311	1145	1583	172	1145	973		455	547		505	
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	
Reduced v/c Ratio	0.04	0.69	0.20	0.45	0.55	0.01		0.71	0.14		0.07	

Intersection Summary

Area Type: Other  
 Cycle Length: 60  
 Actuated Cycle Length: 53.7  
 Natural Cycle: 60  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.85  
 Intersection Signal Delay: 18.9  
 Intersection LOS: B  
 Intersection Capacity Utilization 61.0%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 4: Site Access 2/Wheatberry Hill Drive & Weddington Road



Intersection: 2: Providence Road S & Lenny Stadler Way/Site Access 1

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	LT	R	LT	R	L	T	TR	L	T	TR	
Maximum Queue (ft)	94	61	50	40	191	458	476	131	257	252	
Average Queue (ft)	38	22	17	11	68	166	190	64	131	134	
95th Queue (ft)	84	54	46	36	186	488	509	129	239	244	
Link Distance (ft)	1008				2759			2759		1068	1068
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	50		425			325			100		
Storage Blk Time (%)	13	4				5		6	8		
Queuing Penalty (veh)	5	2				5		40	8		

Intersection: 4: Site Access 2/Wheatberry Hill Drive & Weddington Road

Movement	EB	EB	EB	B5	B5	WB	WB	WB	NB	NB	SB
Directions Served	L	T	R	T		L	T	R	LT	R	LTR
Maximum Queue (ft)	30	216	179	66	79	200	765	50	323	198	48
Average Queue (ft)	6	118	69	4	5	94	440	4	188	79	14
95th Queue (ft)	25	206	167	93	111	222	880	45	292	183	43
Link Distance (ft)	866		728		728	1166		1002		954	
Upstream Blk Time (%)					0	1					
Queuing Penalty (veh)					0	0					
Storage Bay Dist (ft)	125		150			100		125		100	
Storage Blk Time (%)	6		1		0		39	33		1	
Queuing Penalty (veh)	25		4		3		47	37		5	

Zone Summary

Zone wide Queuing Penalty: 181

Intersection: 2: Providence Road S & Lenny Stadler Way/Site Access 1

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	76	53	72	114	84	183	216	47	298	299
Average Queue (ft)	33	15	33	65	37	84	117	6	161	159
95th Queue (ft)	69	46	69	113	77	161	206	38	293	289
Link Distance (ft)	1008		454			2759	2759		1068	1068
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		50		425	325			100		
Storage Blk Time (%)	8	2							14	
Queuing Penalty (veh)	2	1							1	

Intersection: 4: Site Access 2/Wheatberry Hill Drive & Weddington Road

Movement	EB	EB	EB	B5	WB	WB	WB	NB	NB	SB
Directions Served	L	T	R	T	L	T	R	LT	R	LTR
Maximum Queue (ft)	37	483	250	354	110	244	33	233	163	44
Average Queue (ft)	9	224	80	40	44	132	4	133	46	17
95th Queue (ft)	31	432	250	278	95	230	34	223	117	46
Link Distance (ft)		866		728		1166		1002		954
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	125		150		100		125		100	
Storage Blk Time (%)		18	0		1	11		17	0	
Queuing Penalty (veh)		59	0		4	10		14	1	

Zone Summary

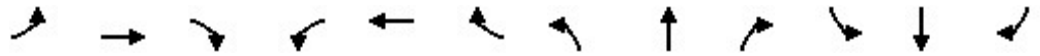
Zone wide Queuing Penalty: 92
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## **2031 Build + Improvements Traffic Volumes**

Liberty Classical Academy

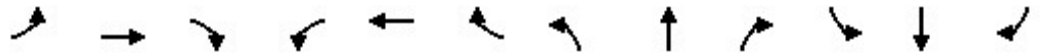
2: Providence Road S & Lenny Stadler Way/Site Access 1

04/25/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↕		↖	↕	
Traffic Volume (vph)	46	4	34	4	4	4	89	1533	17	39	1198	72
Future Volume (vph)	46	4	34	4	4	4	89	1533	17	39	1198	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			1%			1%	
Storage Length (ft)	0		50	0		425	325		100	100		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Fr <sub>t</sub>			0.850			0.850		0.997			0.992	
Fl <sub>t</sub> Protected		0.959			0.976		0.950			0.950		
Satd. Flow (prot)	0	1777	1575	0	1818	1583	1761	3511	0	1761	3493	0
Fl <sub>t</sub> Permitted		0.744			0.811		0.122			0.126		
Satd. Flow (perm)	0	1379	1575	0	1511	1583	226	3511	0	234	3493	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			10			35			35	
Link Distance (ft)		1059			785			2837			1141	
Travel Time (s)		20.6			53.5			55.3			22.2	
Peak Hour Factor	0.90	0.50	0.90	0.50	0.50	0.50	0.90	0.88	0.50	0.50	0.88	0.90
Adj. Flow (vph)	51	8	38	8	8	8	99	1742	34	78	1361	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	59	38	0	16	8	99	1776	0	78	1441	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	D.P+P	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8		8	6			6		
Detector Phase	4	4	5	8	8	8	5	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	10.0		10.0	10.0	
Minimum Split (s)	12.4	12.4	12.3	20.0	20.0	20.0	12.3	15.3		36.3	36.3	
Total Split (s)	20.0	20.0	12.3	20.0	20.0	20.0	12.3	70.0		57.7	57.7	
Total Split (%)	22.2%	22.2%	13.7%	22.2%	22.2%	22.2%	13.7%	77.8%		64.1%	64.1%	
Maximum Green (s)	14.6	14.6	7.0	13.0	13.0	13.0	7.0	64.7		52.4	52.4	
Yellow Time (s)	3.0	3.0	3.0	5.0	5.0	5.0	3.0	3.8		3.8	3.8	
All-Red Time (s)	2.4	2.4	2.3	2.0	2.0	2.0	2.3	1.5		1.5	1.5	
Lost Time Adjust (s)		-2.0	-0.3		-2.0	-2.0	-0.3	-0.3		-2.0	-0.3	
Total Lost Time (s)		3.4	5.0		5.0	5.0	5.0	5.0		3.3	5.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Min		Min	Min	



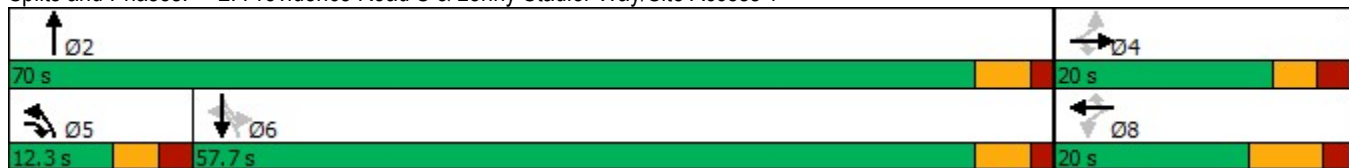


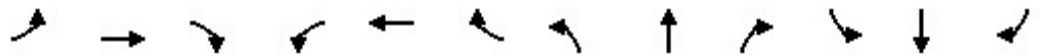
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										24.0	24.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		11.6	15.7		10.8	10.8	47.9	54.9		45.7	44.4	
Actuated g/C Ratio		0.18	0.24		0.17	0.17	0.74	0.85		0.71	0.69	
v/c Ratio		0.24	0.10		0.06	0.03	0.27	0.60		0.47	0.60	
Control Delay		33.1	22.9		32.9	32.5	4.9	4.8		21.8	10.3	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		33.1	22.9		32.9	32.5	4.9	4.8		21.8	10.3	
LOS		C	C		C	C	A	A		C	B	
Approach Delay		29.1			32.8			4.8			10.9	
Approach LOS		C			C			A			B	
Queue Length 50th (ft)		23	11		6	3	10	171		19	226	
Queue Length 95th (ft)		35	39		14	9	23	258		25	313	
Internal Link Dist (ft)		979			705			2757			1061	
Turn Bay Length (ft)			50			425	325			100		
Base Capacity (vph)		402	382		398	417	364	3126		189	2785	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.15	0.10		0.04	0.02	0.27	0.57		0.41	0.52	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	64.8
Natural Cycle:	80
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.60
Intersection Signal Delay:	8.3
Intersection LOS:	A
Intersection Capacity Utilization:	71.5%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 2: Providence Road S & Lenny Stadler Way/Site Access 1





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	459	179	45	847	9	179	4	45	6	4	12
Future Volume (vph)	6	459	179	45	847	9	179	4	45	6	4	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		150	100		125	0		100	0		0
Storage Lanes	1		1	1		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.937	
Flt Protected	0.950			0.950				0.953			0.988	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	0	1775	1583	0	1724	0
Flt Permitted	0.102			0.385				0.710			0.895	
Satd. Flow (perm)	190	1863	1583	717	1863	1583	0	1323	1583	0	1562	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35		35				10			25	
Link Distance (ft)		934		1208				1091			997	
Travel Time (s)		18.2		23.5				74.4			27.2	
Peak Hour Factor	0.90	0.90	0.50	0.50	0.89	0.90	0.50	0.50	0.50	0.90	0.50	0.90
Adj. Flow (vph)	7	510	358	90	952	10	358	8	90	7	8	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	510	358	90	952	10	0	366	90	0	28	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12		12				0			0	
Link Offset(ft)		0		0				0			0	
Crosswalk Width(ft)		16		16				16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Free	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		Free	6		6	8		8	4		
Detector Phase	2	2		6	6	6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	19.0	19.0		19.0	19.0	19.0	14.0	14.0	14.0	14.0	14.0	
Total Split (s)	48.0	48.0		48.0	48.0	48.0	27.0	27.0	27.0	27.0	27.0	
Total Split (%)	64.0%	64.0%		64.0%	64.0%	64.0%	36.0%	36.0%	36.0%	36.0%	36.0%	
Maximum Green (s)	41.0	41.0		41.0	41.0	41.0	20.0	20.0	20.0	20.0	20.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0		-2.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	
Recall Mode	Min	Min		Min	Min	Min	None	None	None	None	None	
Act Effect Green (s)	39.3	39.3	71.1	39.3	39.3	39.3		21.7	21.7		21.7	

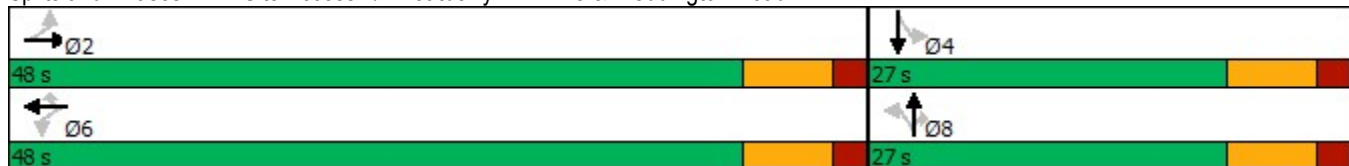


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.55	0.55	1.00	0.55	0.55	0.55		0.31	0.31		0.31	
v/c Ratio	0.07	0.49	0.23	0.23	0.92	0.01		0.91	0.19		0.06	
Control Delay	9.0	11.6	0.3	9.7	30.7	7.0		54.8	21.0		19.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	9.0	11.6	0.3	9.7	30.7	7.0		54.8	21.0		19.5	
LOS	A	B	A	A	C	A		D	C		B	
Approach Delay		7.0			28.7			48.2			19.5	
Approach LOS		A			C			D			B	
Queue Length 50th (ft)	1	127	0	19	352	2		165	31		9	
Queue Length 95th (ft)	7	198	0	21	#619	8		122	35		15	
Internal Link Dist (ft)		854			1128			1011			917	
Turn Bay Length (ft)	125		150	100		125			100			
Base Capacity (vph)	115	1136	1583	437	1136	965		413	493		487	
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	
Reduced v/c Ratio	0.06	0.45	0.23	0.21	0.84	0.01		0.89	0.18		0.06	

Intersection Summary

Area Type: Other  
 Cycle Length: 75  
 Actuated Cycle Length: 71.1  
 Natural Cycle: 75  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 24.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 69.7%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

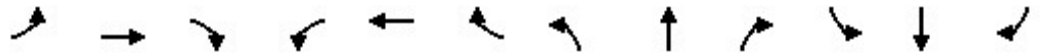
Splits and Phases: 4: Site Access 2/Wheatberry Hill Drive & Weddington Road



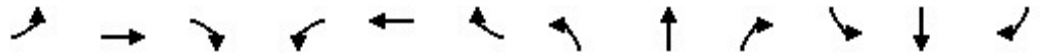
Liberty Classical Academy

2: Providence Road S & Lenny Stadler Way/Site Access 1

04/25/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↕		↖	↕	
Traffic Volume (vph)	45	4	28	17	4	39	51	1370	4	4	1352	51
Future Volume (vph)	45	4	28	17	4	39	51	1370	4	4	1352	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			0%			1%			1%	
Storage Length (ft)	0		50	0		425	325		100	100		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850			0.850		0.999			0.995	
Flt Protected		0.959			0.961		0.950			0.950		
Satd. Flow (prot)	0	1777	1575	0	1790	1583	1761	3518	0	1761	3504	0
Flt Permitted		0.733			0.727		0.093			0.164		
Satd. Flow (perm)	0	1359	1575	0	1354	1583	172	3518	0	304	3504	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			10			35			35	
Link Distance (ft)		1059			785			2837			1141	
Travel Time (s)		20.6			53.5			55.3			22.2	
Peak Hour Factor	0.90	0.50	0.90	0.50	0.50	0.50	0.90	0.89	0.50	0.50	0.89	0.90
Adj. Flow (vph)	50	8	31	34	8	78	57	1539	8	8	1519	57
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	58	31	0	42	78	57	1547	0	8	1576	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	pm+ov	Perm	NA	Perm	D.P+P	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8		8	6			6		
Detector Phase	4	4	5	8	8	8	5	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	10.0		10.0	10.0	
Minimum Split (s)	12.4	12.4	12.3	20.0	20.0	20.0	12.3	15.3		36.3	36.3	
Total Split (s)	20.0	20.0	12.3	20.0	20.0	20.0	12.3	70.0		57.7	57.7	
Total Split (%)	22.2%	22.2%	13.7%	22.2%	22.2%	22.2%	13.7%	77.8%		64.1%	64.1%	
Maximum Green (s)	14.6	14.6	7.0	13.0	13.0	13.0	7.0	64.7		52.4	52.4	
Yellow Time (s)	3.0	3.0	3.0	5.0	5.0	5.0	3.0	3.8		3.8	3.8	
All-Red Time (s)	2.4	2.4	2.3	2.0	2.0	2.0	2.3	1.5		1.5	1.5	
Lost Time Adjust (s)		-2.0	-0.3		-2.0	-2.0	-0.3	-0.3		-2.0	-0.3	
Total Lost Time (s)		3.4	5.0		5.0	5.0	5.0	5.0		3.3	5.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	3.0	3.0	3.0	2.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Min		Min	Min	



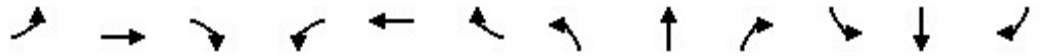
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										24.0	24.0	
Pedestrian Calls (#/hr)										0	0	
Act Effct Green (s)		13.0	17.4		12.3	12.3	48.1	53.8		46.2	45.0	
Actuated g/C Ratio		0.19	0.25		0.18	0.18	0.69	0.77		0.66	0.65	
v/c Ratio		0.23	0.08		0.17	0.28	0.19	0.57		0.04	0.69	
Control Delay		32.3	22.0		32.7	33.9	5.0	6.0		7.8	14.3	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		32.3	22.0		32.7	33.9	5.0	6.0		7.8	14.3	
LOS		C	C		C	C	A	A		A	B	
Approach Delay		28.7			33.5			6.0			14.3	
Approach LOS		C			C			A			B	
Queue Length 50th (ft)		23	10		17	33	6	152		2	287	
Queue Length 95th (ft)		34	33		28	43	17	239		4	410	
Internal Link Dist (ft)		979			705			2757			1061	
Turn Bay Length (ft)			50			425	325			100		
Base Capacity (vph)		369	393		332	388	308	3059		231	2603	
Starvation Cap Reductn		0	0		0	0	0	0		0	0	
Spillback Cap Reductn		0	0		0	0	0	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.16	0.08		0.13	0.20	0.19	0.51		0.03	0.61	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	69.5
Natural Cycle:	75
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.69
Intersection Signal Delay:	11.4
Intersection LOS:	B
Intersection Capacity Utilization:	63.2%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 2: Providence Road S & Lenny Stadler Way/Site Access 1





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	751	126	31	615	12	126	4	31	13	4	12
Future Volume (vph)	13	751	126	31	615	12	126	4	31	13	4	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		150	100		125	0		100	0		0
Storage Lanes	1		1	1		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.950	
Flt Protected	0.950			0.950				0.954			0.980	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	0	1777	1583	0	1734	0
Flt Permitted	0.250			0.131				0.707			0.844	
Satd. Flow (perm)	466	1863	1583	244	1863	1583	0	1317	1583	0	1494	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			10			25	
Link Distance (ft)		934			1208			1091			997	
Travel Time (s)		18.2			23.5			74.4			27.2	
Peak Hour Factor	0.90	0.89	0.50	0.50	0.90	0.90	0.50	0.50	0.50	0.90	0.50	0.90
Adj. Flow (vph)	14	844	252	62	683	13	252	8	62	14	8	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	844	252	62	683	13	0	260	62	0	35	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Free	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		Free	6		6	8		8	4		
Detector Phase	2	2		6	6	6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	19.0	19.0		19.0	19.0	19.0	14.0	14.0	14.0	14.0	14.0	
Total Split (s)	45.0	45.0		45.0	45.0	45.0	30.0	30.0	30.0	30.0	30.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%	60.0%	40.0%	40.0%	40.0%	40.0%	40.0%	
Maximum Green (s)	38.0	38.0		38.0	38.0	38.0	23.0	23.0	23.0	23.0	23.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0		-2.0	-2.0		-2.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	
Recall Mode	Min	Min		Min	Min	Min	None	None	None	None	None	
Act Effect Green (s)	32.3	32.3	61.4	32.3	32.3	32.3		18.5	18.5		18.5	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.53	0.53	1.00	0.53	0.53	0.53		0.30	0.30		0.30	
v/c Ratio	0.06	0.86	0.16	0.48	0.70	0.02		0.66	0.13		0.08	
Control Delay	8.9	24.4	0.2	26.2	16.1	8.0		29.0	17.9		17.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	
Total Delay	8.9	24.4	0.2	26.2	16.1	8.0		29.0	17.9		17.5	
LOS	A	C	A	C	B	A		C	B		B	
Approach Delay		18.7			16.8			26.8			17.5	
Approach LOS		B			B			C			B	
Queue Length 50th (ft)	2	256	0	14	180	2		90	18		10	
Queue Length 95th (ft)	12	#542	0	22	338	10		82	24		16	
Internal Link Dist (ft)		854			1128			1011			917	
Turn Bay Length (ft)	125		150	100		125			100			
Base Capacity (vph)	321	1284	1583	168	1284	1091		568	682		644	
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	
Reduced v/c Ratio	0.04	0.66	0.16	0.37	0.53	0.01		0.46	0.09		0.05	

Intersection Summary

Area Type: Other  
 Cycle Length: 75  
 Actuated Cycle Length: 61.4  
 Natural Cycle: 60  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 19.2  
 Intersection LOS: B  
 Intersection Capacity Utilization 63.7%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 4: Site Access 2/Wheatberry Hill Drive & Weddington Road



Intersection: 2: Providence Road S & Lenny Stadler Way/Site Access 1

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	LT	R	LT	R	L	T	TR	L	T	TR	
Maximum Queue (ft)	97	61	42	33	183	419	442	122	217	218	
Average Queue (ft)	44	24	11	7	64	165	199	56	109	112	
95th Queue (ft)	86	54	37	27	218	488	527	111	205	208	
Link Distance (ft)	1008				2759			2759		1068	1068
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	50		425		325		100				
Storage Blk Time (%)	14	5					6	1	6		
Queuing Penalty (veh)	5	3					6	10	5		

Intersection: 4: Site Access 2/Wheatberry Hill Drive & Weddington Road

Movement	EB	EB	EB	B5	WB	WB	WB	NB	NB	SB
Directions Served	L	T	R	T	L	T	R	LT	R	LTR
Maximum Queue (ft)	26	225	166	316	199	892	92	209	111	44
Average Queue (ft)	5	107	40	25	84	475	8	121	41	17
95th Queue (ft)	22	198	133	229	214	1052	72	200	92	44
Link Distance (ft)	866		728		1166		1002		954	
Upstream Blk Time (%)	0				8					
Queuing Penalty (veh)	0				0					
Storage Bay Dist (ft)	125	150		100		125		100		
Storage Blk Time (%)	4		1	0		35	17		0	
Queuing Penalty (veh)	13		3	3		35	15		1	

Zone Summary

Zone wide Queuing Penalty: 98



Intersection: 2: Providence Road S & Lenny Stadler Way/Site Access 1

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	81	55	68	108	65	170	203	127	596	596
Average Queue (ft)	41	21	30	53	30	82	113	21	233	235
95th Queue (ft)	81	52	69	104	60	155	190	109	566	570
Link Distance (ft)	1008		721			2759	2759		1068	1068
Upstream Blk Time (%)									0	0
Queuing Penalty (veh)									0	1
Storage Bay Dist (ft)		50		425	325			100		
Storage Blk Time (%)	14	4							26	
Queuing Penalty (veh)	4	2							2	

Intersection: 4: Site Access 2/Wheatberry Hill Drive & Weddington Road

Movement	EB	EB	EB	B5	B5	WB	WB	WB	NB	NB	SB
Directions Served	L	T	R	T		L	T	R	LT	R	LTR
Maximum Queue (ft)	68	349	249	365	61	94	261	7	157	65	50
Average Queue (ft)	11	189	52	24	4	35	133	1	95	33	22
95th Queue (ft)	56	324	208	223	86	79	234	5	150	64	51
Link Distance (ft)		866		728	728		1166		1002		954
Upstream Blk Time (%)				0							
Queuing Penalty (veh)				0							
Storage Bay Dist (ft)	125		150			100		125		100	
Storage Blk Time (%)		13				0	10		9		
Queuing Penalty (veh)		35				1	8		5		

























Zone Summary

Zone wide Queuing Penalty: 59

**2040 Horizon Year Background Traffic Volumes**

Liberty Classical Academy  
3: Providence Road S & Rae Road

04/07/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	363	327	442	155	535	63	712	1371	152	63	1381	590
Future Volume (vph)	363	327	442	155	535	63	712	1371	152	63	1381	590
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	450		400	250		250	350		250	450		500
Storage Lanes	2		1	1		1	2		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	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)	3433	3539	1583	1770	3539	1583	3433	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	3433	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)		1243			1501			1182			1356	
Travel Time (s)		24.2			29.2			17.9			20.5	
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)	403	363	491	172	594	70	791	1523	169	70	1534	656
Shared Lane Traffic (%)												
Lane Group Flow (vph)	403	363	491	172	594	70	791	1523	169	70	1534	656
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	16.0	21.0	28.0	17.0	22.0	14.0	28.0	68.0	17.0	14.0	54.0	16.0
Total Split (%)	13.3%	17.5%	23.3%	14.2%	18.3%	11.7%	23.3%	56.7%	14.2%	11.7%	45.0%	13.3%
Maximum Green (s)	9.0	14.0	21.0	10.0	15.0	7.0	21.0	61.0	10.0	7.0	47.0	9.0
Yellow 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
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	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	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0
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	0.0

Liberty Classical Academy  
 3: Providence Road S & Rae Road

04/07/2023

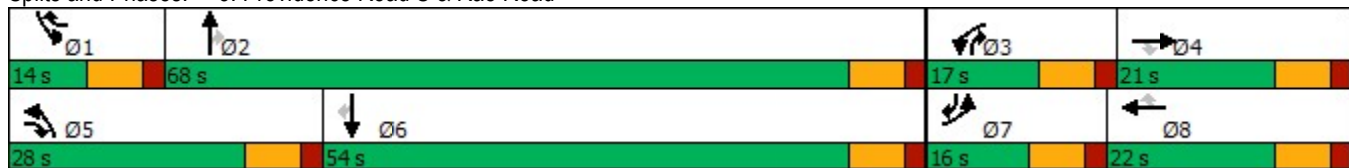


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	0.0
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	11.0	16.0	44.0	12.0	17.0	31.0	23.0	63.0	80.0	9.0	49.0	65.0
Actuated g/C Ratio	0.09	0.13	0.37	0.10	0.14	0.26	0.19	0.52	0.67	0.08	0.41	0.54
v/c Ratio	1.28	0.77	0.85	0.97	1.19	0.17	1.20	0.82	0.16	0.53	1.06	0.77
Control Delay	193.1	62.1	50.1	114.9	146.8	36.0	147.7	28.4	7.9	68.6	76.8	28.9
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	193.1	62.1	50.1	114.9	146.8	36.0	147.7	28.4	7.9	68.6	76.8	28.9
LOS	F	E	D	F	F	D	F	C	A	E	E	C
Approach Delay		99.4			131.0			65.0			62.6	
Approach LOS		F			F			E			E	
Queue Length 50th (ft)	~204	144	346	135	~291	42	~384	498	45	53	~688	382
Queue Length 95th (ft)	#306	#208	#535	#278	#408	82	#507	602	73	103	#827	548
Internal Link Dist (ft)		1163			1421			1102			1276	
Turn Bay Length (ft)	450		400	250		250	350		250	450		500
Base Capacity (vph)	314	471	580	177	501	408	657	1857	1055	132	1445	857
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	1.28	0.77	0.85	0.97	1.19	0.17	1.20	0.82	0.16	0.53	1.06	0.77

Intersection Summary































Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Natural Cycle: 120  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 1.28  
 Intersection Signal Delay: 78.6      Intersection LOS: E  
 Intersection Capacity Utilization 100.3%      ICU Level of Service G  
 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: 3: Providence Road S & Rae Road



Liberty Classical Academy  
3: Providence Road S & Rae Road

04/07/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 		 	 			 	
Traffic Volume (vph)	590	535	713	153	327	63	442	1381	155	63	1371	363
Future Volume (vph)	590	535	713	153	327	63	442	1381	155	63	1371	363
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	450		400	250		250	350		250	450		500
Storage Lanes	2		1	1		1	2		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	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)	3433	3539	1583	1770	3539	1583	3433	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	3433	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)		1243			1501			1182			1356	
Travel Time (s)		24.2			29.2			17.9			20.5	
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)	656	594	792	170	363	70	491	1534	172	70	1523	403
Shared Lane Traffic (%)												
Lane Group Flow (vph)	656	594	792	170	363	70	491	1534	172	70	1523	403
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	24.0	24.0	30.0	15.0	15.0	14.0	30.0	67.0	15.0	14.0	51.0	24.0
Total Split (%)	20.0%	20.0%	25.0%	12.5%	12.5%	11.7%	25.0%	55.8%	12.5%	11.7%	42.5%	20.0%
Maximum Green (s)	17.0	17.0	23.0	8.0	8.0	7.0	23.0	60.0	8.0	7.0	44.0	17.0
Yellow 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
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	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	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0
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	0.0

Liberty Classical Academy  
 3: Providence Road S & Rae Road

04/07/2023

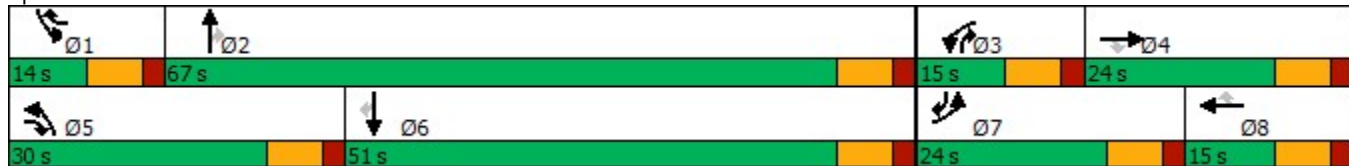


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	0.0
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	19.0	19.0	49.0	10.0	10.0	24.0	25.0	62.0	77.0	9.0	46.0	70.0
Actuated g/C Ratio	0.16	0.16	0.41	0.08	0.08	0.20	0.21	0.52	0.64	0.08	0.38	0.58
v/c Ratio	1.21	1.06	1.23	1.16	1.23	0.22	0.69	0.84	0.17	0.53	1.12	0.44
Control Delay	153.2	103.4	147.7	170.7	176.8	42.4	49.6	30.1	9.2	68.6	100.8	15.8
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	153.2	103.4	147.7	170.7	176.8	42.4	49.6	30.1	9.2	68.6	100.8	15.8
LOS	F	F	F	F	F	D	D	C	A	E	F	B
Approach Delay	136.6				159.5				32.8		82.5	
Approach LOS	F				F				C		F	
Queue Length 50th (ft)	~319	~266	~756	~155	~182	46	182	514	50	53	~716	165
Queue Length 95th (ft)	#437	#384	#996	#297	#283	89	242	620	80	103	#856	241
Internal Link Dist (ft)	1163				1421				1102		1276	
Turn Bay Length (ft)	450		400	250		250	350		250	450		500
Base Capacity (vph)	543	560	646	147	294	316	715	1828	1015	132	1356	923
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	1.21	1.06	1.23	1.16	1.23	0.22	0.69	0.84	0.17	0.53	1.12	0.44

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Natural Cycle: 120  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 1.23  
 Intersection Signal Delay: 89.5      Intersection LOS: F  
 Intersection Capacity Utilization 103.0%      ICU Level of Service G  
 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: 3: Providence Road S & Rae Road



Intersection: 3: Providence Road S & Rae Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	L	T
Maximum Queue (ft)	500	550	1207	1203	495	350	1365	1336	350	400	450	1155
Average Queue (ft)	480	526	832	773	368	313	910	871	230	398	448	1097
95th Queue (ft)	555	614	1470	1428	564	451	1517	1474	486	406	458	1330
Link Distance (ft)			1182	1182			1439	1439				1115
Upstream Blk Time (%)			23	9			7	5				62
Queuing Penalty (veh)			0	0			0	0				0
Storage Bay Dist (ft)	450	450			400	250			250	350	350	
Storage Blk Time (%)	57	80	1	1	22	13	85	82		57	77	0
Queuing Penalty (veh)	102	145	4	6	40	38	146	58		436	590	0

Intersection: 3: Providence Road S & Rae Road

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	R	L	T	T	R
Maximum Queue (ft)	1135	163	550	1318	1326	600
Average Queue (ft)	1067	39	235	1169	1185	580
95th Queue (ft)	1349	133	643	1562	1581	708
Link Distance (ft)	1115			1287	1287	
Upstream Blk Time (%)	8			17	38	
Queuing Penalty (veh)	0			0	0	
Storage Bay Dist (ft)		250	450			500
Storage Blk Time (%)	7			56	53	2
Queuing Penalty (veh)	11			39	348	12

Network Summary

Network wide Queuing Penalty: 1975
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Intersection: 3: Providence Road S & Rae Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	L	T
Maximum Queue (ft)	477	523	1210	1228	500	350	1255	1202	350	232	331	461
Average Queue (ft)	407	448	1194	1202	500	319	791	749	223	163	207	298
95th Queue (ft)	631	677	1226	1221	500	438	1348	1296	478	230	309	443
Link Distance (ft)			1182	1182			1439	1439				1115
Upstream Blk Time (%)			31	68			2	2				
Queuing Penalty (veh)			0	0			0	0				
Storage Bay Dist (ft)	450	450			400	250			250	350	350	
Storage Blk Time (%)	27	43	0	0	85	53	89	88			0	4
Queuing Penalty (veh)	79	127	2	3	254	95	151	61			0	19

Intersection: 3: Providence Road S & Rae Road

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	R	L	T	T	R
Maximum Queue (ft)	468	327	550	1328	1328	600
Average Queue (ft)	298	80	235	1284	1287	597
95th Queue (ft)	444	264	648	1434	1433	658
Link Distance (ft)	1115			1287	1287	
Upstream Blk Time (%)				44	62	
Queuing Penalty (veh)				0	0	
Storage Bay Dist (ft)		250	450			500
Storage Blk Time (%)	13			65	65	
Queuing Penalty (veh)	22			45	261	

Network Summary































Network wide Queuing Penalty: 1119
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## **2040 Horizon Year Build Traffic Volumes**

Liberty Classical Academy  
3: Providence Road S & Rae Road

04/07/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 		 	 			 	
Traffic Volume (vph)	456	327	442	155	535	63	712	1418	152	63	1406	639
Future Volume (vph)	456	327	442	155	535	63	712	1418	152	63	1406	639
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	450		400	250		250	350		250	450		500
Storage Lanes	2		1	1		1	2		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	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)	3433	3539	1583	1770	3539	1583	3433	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	3433	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)		1243			1501			1182			1356	
Travel Time (s)		24.2			29.2			17.9			20.5	
Peak Hour Factor	0.82	0.90	0.90	0.90	0.90	0.90	0.90	0.89	0.90	0.90	0.89	0.87
Adj. Flow (vph)	556	363	491	172	594	70	791	1593	169	70	1580	734
Shared Lane Traffic (%)												
Lane Group Flow (vph)	556	363	491	172	594	70	791	1593	169	70	1580	734
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	21.0	22.0	27.0	20.0	21.0	14.0	27.0	64.0	20.0	14.0	51.0	21.0
Total Split (%)	17.5%	18.3%	22.5%	16.7%	17.5%	11.7%	22.5%	53.3%	16.7%	11.7%	42.5%	17.5%
Maximum Green (s)	14.0	15.0	20.0	13.0	14.0	7.0	20.0	57.0	13.0	7.0	44.0	14.0
Yellow 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
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	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	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0
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	0.0

Liberty Classical Academy  
 3: Providence Road S & Rae Road

04/07/2023

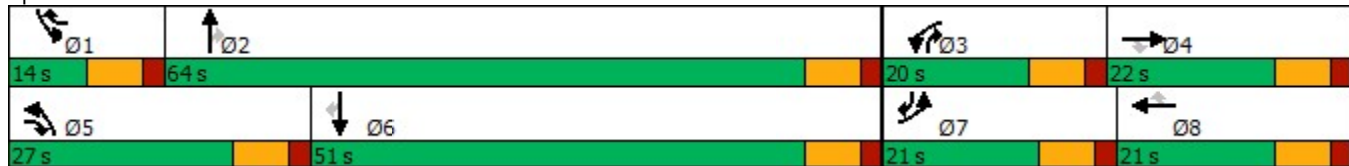


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	0.0
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	16.0	17.5	44.5	14.5	16.0	30.0	22.0	59.0	78.5	9.0	46.0	67.0
Actuated g/C Ratio	0.13	0.15	0.37	0.12	0.13	0.25	0.18	0.49	0.65	0.08	0.38	0.56
v/c Ratio	1.22	0.70	0.84	0.80	1.26	0.18	1.26	0.92	0.16	0.53	1.17	0.83
Control Delay	160.0	57.2	48.9	78.5	176.3	36.8	169.2	37.8	8.4	68.6	117.3	31.9
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	160.0	57.2	48.9	78.5	176.3	36.8	169.2	37.8	8.4	68.6	117.3	31.9
LOS	F	E	D	E	F	D	F	D	A	E	F	C
Approach Delay		94.8			144.5			76.6			89.6	
Approach LOS		F			F			E			F	
Queue Length 50th (ft)	~271	143	346	131	~303	43	~395	582	46	53	~764	447
Queue Length 95th (ft)	#333	197	#535	#242	#421	83	#519	686	75	103	#887	601
Internal Link Dist (ft)		1163			1421			1102			1276	
Turn Bay Length (ft)	450		400	250		250	350		250	450		500
Base Capacity (vph)	457	516	587	221	471	395	629	1740	1042	132	1356	883
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	1.22	0.70	0.84	0.78	1.26	0.18	1.26	0.92	0.16	0.53	1.17	0.83

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Natural Cycle: 120  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 1.26  
 Intersection Signal Delay: 92.4      Intersection LOS: F  
 Intersection Capacity Utilization 103.6%      ICU Level of Service G  
 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: 3: Providence Road S & Rae Road



Liberty Classical Academy  
3: Providence Road S & Rae Road

04/07/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	628	535	713	153	327	63	442	1401	155	63	1416	452
Future Volume (vph)	628	535	713	153	327	63	442	1401	155	63	1416	452
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	450		400	250		250	350		250	450		500
Storage Lanes	2		1	1		1	2		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	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)	3433	3539	1583	1770	3539	1583	3433	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	3433	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)		1243			1501			1182			1356	
Travel Time (s)		24.2			29.2			17.9			20.5	
Peak Hour Factor	0.88	0.90	0.90	0.90	0.90	0.90	0.90	0.89	0.90	0.90	0.89	0.82
Adj. Flow (vph)	714	594	792	170	363	70	491	1574	172	70	1591	551
Shared Lane Traffic (%)												
Lane Group Flow (vph)	714	594	792	170	363	70	491	1574	172	70	1591	551
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	25.0	24.0	28.0	16.0	15.0	14.0	28.0	66.0	16.0	14.0	52.0	25.0
Total Split (%)	20.8%	20.0%	23.3%	13.3%	12.5%	11.7%	23.3%	55.0%	13.3%	11.7%	43.3%	20.8%
Maximum Green (s)	18.0	17.0	21.0	9.0	8.0	7.0	21.0	59.0	9.0	7.0	45.0	18.0
Yellow 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
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	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	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0
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	0.0

Liberty Classical Academy  
 3: Providence Road S & Rae Road

04/07/2023

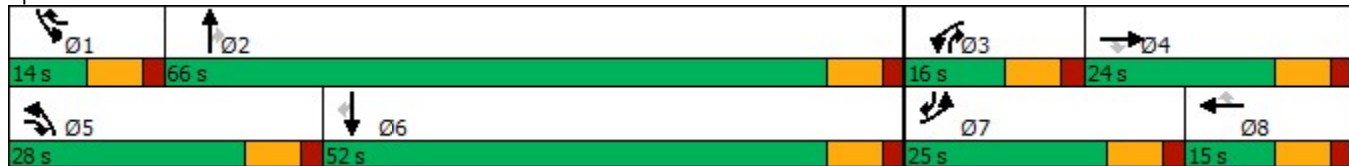


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	30.0	0.0
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	20.0	19.0	47.0	11.0	10.0	24.0	23.0	61.0	77.0	9.0	47.0	72.0
Actuated g/C Ratio	0.17	0.16	0.39	0.09	0.08	0.20	0.19	0.51	0.64	0.08	0.39	0.60
v/c Ratio	1.25	1.06	1.28	1.05	1.23	0.22	0.75	0.88	0.17	0.53	1.15	0.58
Control Delay	167.4	103.4	169.6	136.9	176.8	42.4	53.7	33.0	9.2	68.6	109.9	17.8
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	167.4	103.4	169.6	136.9	176.8	42.4	53.7	33.0	9.2	68.6	109.9	17.8
LOS	F	F	F	F	F	D	D	C	A	E	F	B
Approach Delay		150.1			149.9			35.7			85.6	
Approach LOS		F			F			D			F	
Queue Length 50th (ft)	~355	~266	~777	~143	~182	46	186	549	50	53	~761	247
Queue Length 95th (ft)	#460	#384	#1017	#285	#283	89	247	647	80	103	#884	301
Internal Link Dist (ft)		1163			1421			1102			1276	
Turn Bay Length (ft)	450		400	250		250	350		250	450		500
Base Capacity (vph)	572	560	620	162	294	316	657	1798	1015	132	1386	949
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	1.25	1.06	1.28	1.05	1.23	0.22	0.75	0.88	0.17	0.53	1.15	0.58

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Natural Cycle: 120  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 1.28  
 Intersection Signal Delay: 94.4      Intersection LOS: F  
 Intersection Capacity Utilization 104.3%      ICU Level of Service G  
 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: 3: Providence Road S & Rae Road



Intersection: 3: Providence Road S & Rae Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	L	T
Maximum Queue (ft)	500	550	1211	1216	455	350	1464	1464	350	400	450	1158
Average Queue (ft)	494	542	1047	1009	343	307	1076	1044	207	399	449	1122
95th Queue (ft)	531	589	1521	1540	553	475	1683	1663	470	400	449	1241
Link Distance (ft)			1182	1182			1439	1439				1115
Upstream Blk Time (%)			50	16			24	20				64
Queuing Penalty (veh)			0	0			0	0				0
Storage Bay Dist (ft)	450	450			400	250			250	350	350	
Storage Blk Time (%)	57	84	0	1	22	2	90	88		56	78	2
Queuing Penalty (veh)	104	152	1	4	40	6	155	62		443	620	13

Intersection: 3: Providence Road S & Rae Road

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	R	L	T	T	R
Maximum Queue (ft)	1141	216	550	1318	1338	600
Average Queue (ft)	1094	63	245	1292	1302	598
95th Queue (ft)	1253	226	651	1393	1388	627
Link Distance (ft)	1115			1287	1287	
Upstream Blk Time (%)	11			22	56	
Queuing Penalty (veh)	0			0	0	
Storage Bay Dist (ft)		250	450			500
Storage Blk Time (%)	13			61	60	3
Queuing Penalty (veh)	21			42	442	20

Network Summary

Network wide Queuing Penalty: 2125
------------------------------------

Intersection: 3: Providence Road S & Rae Road

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	T	R	L	L	T
Maximum Queue (ft)	451	494	1213	1231	500	350	1238	1184	350	283	399	506
Average Queue (ft)	396	438	1197	1204	500	322	773	734	224	185	237	314
95th Queue (ft)	623	677	1212	1223	500	430	1309	1260	479	287	380	481
Link Distance (ft)			1182	1182			1439	1439				1115
Upstream Blk Time (%)			31	71			2	1				
Queuing Penalty (veh)			0	0			0	0				
Storage Bay Dist (ft)	450	450			400	250			250	350	350	
Storage Blk Time (%)	24	40	0		87	24	89	89		0	1	6
Queuing Penalty (veh)	72	119	0		258	44	151	62		0	4	27

Intersection: 3: Providence Road S & Rae Road

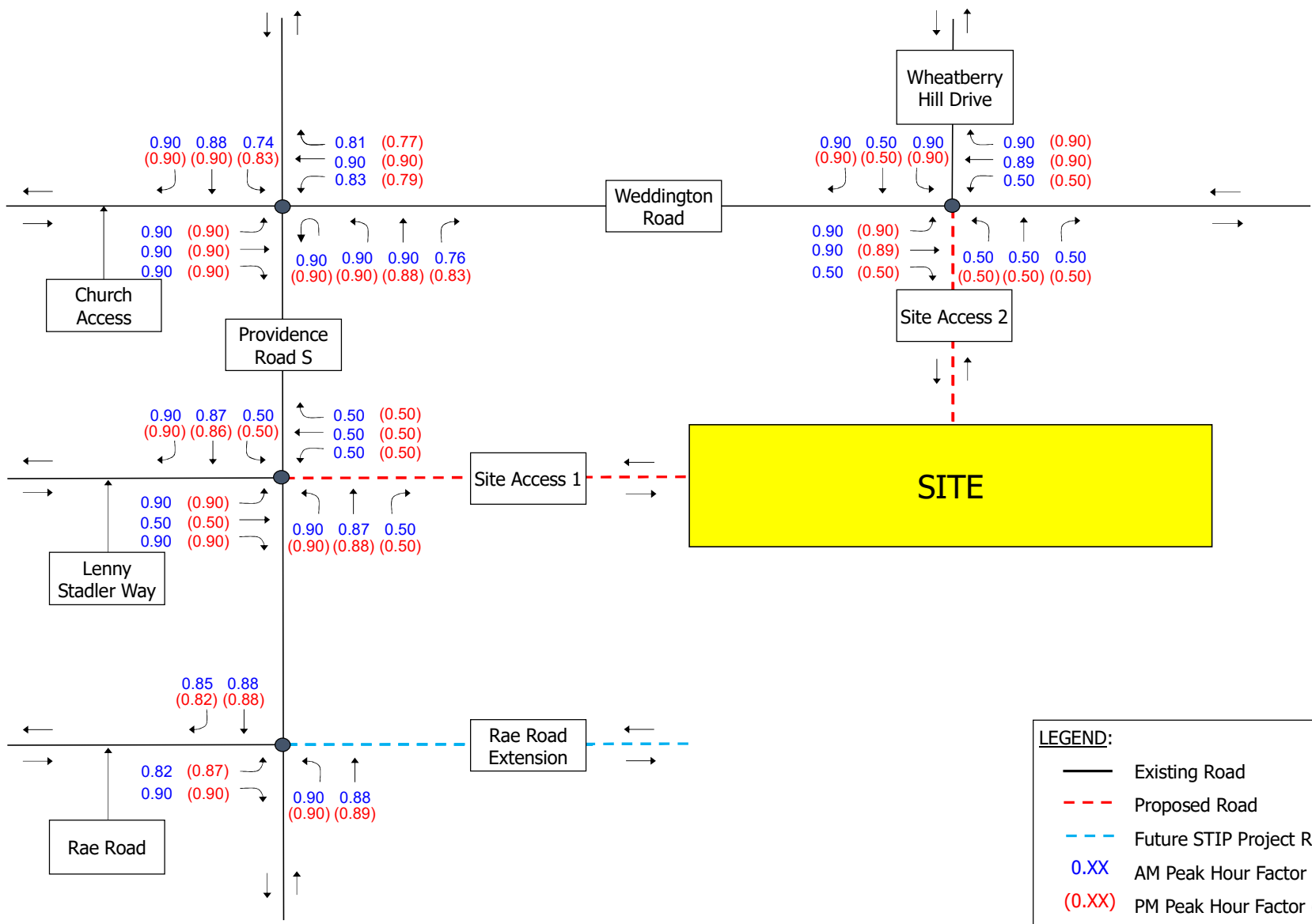
Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	R	L	T	T	R
Maximum Queue (ft)	493	349	550	1325	1329	600
Average Queue (ft)	313	101	259	1289	1296	591
95th Queue (ft)	477	314	668	1398	1402	692
Link Distance (ft)	1115			1287	1287	
Upstream Blk Time (%)				35	58	
Queuing Penalty (veh)				0	0	
Storage Bay Dist (ft)		250	450			500
Storage Blk Time (%)	15			62	61	
Queuing Penalty (veh)	26			43	337	

Network Summary

Network wide Queuing Penalty: 1144

## **Appendix E – Weighted Peak Hour Factors**





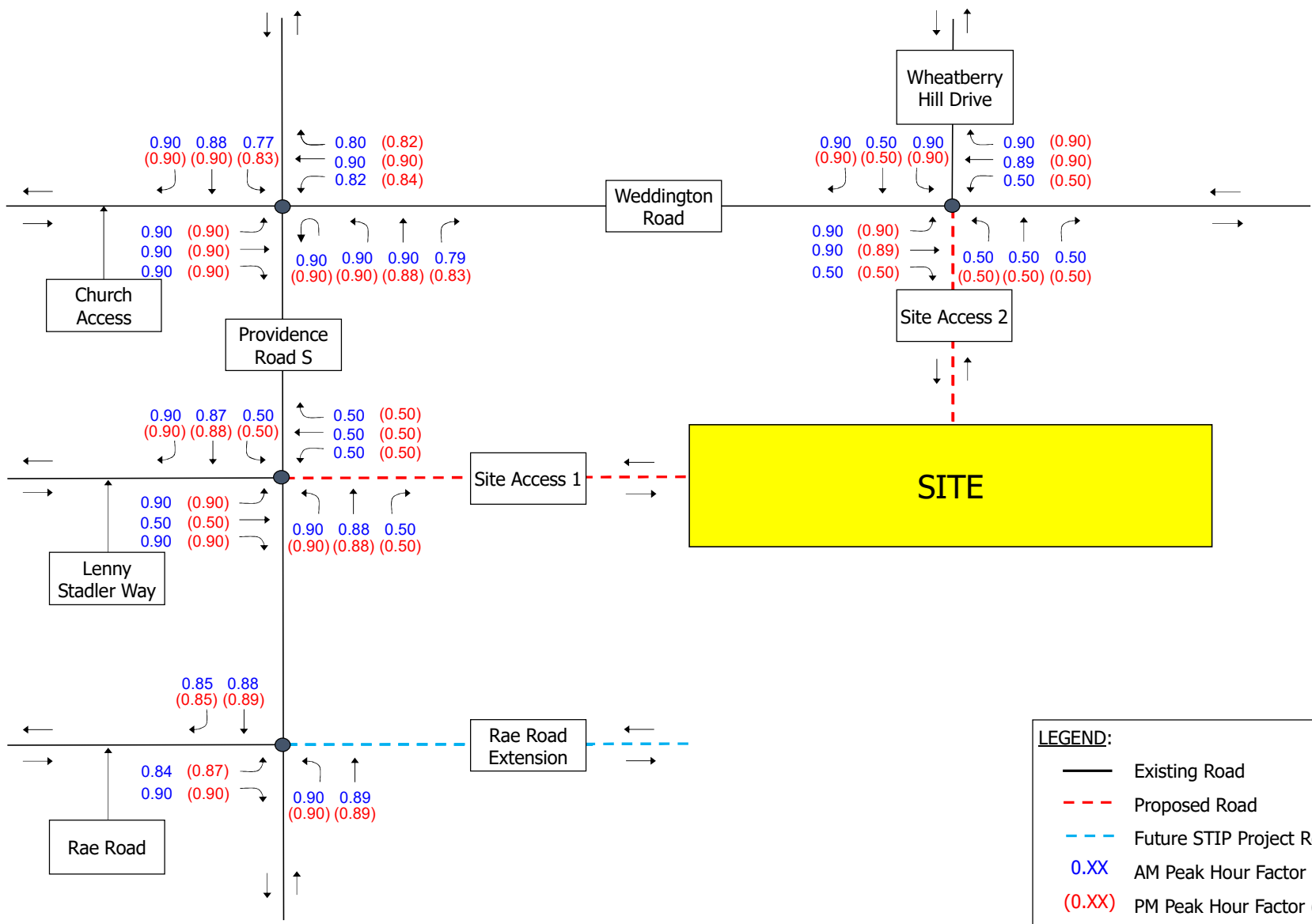
**LEGEND:**

- Existing Road
- - - Proposed Road
- - - Future STIP Project Road
- 0.XX AM Peak Hour Factor (PHF)
- (0.XX) PM Peak Hour Factor (PHF)



**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 High School Peak Hour Factors

Figure E-1



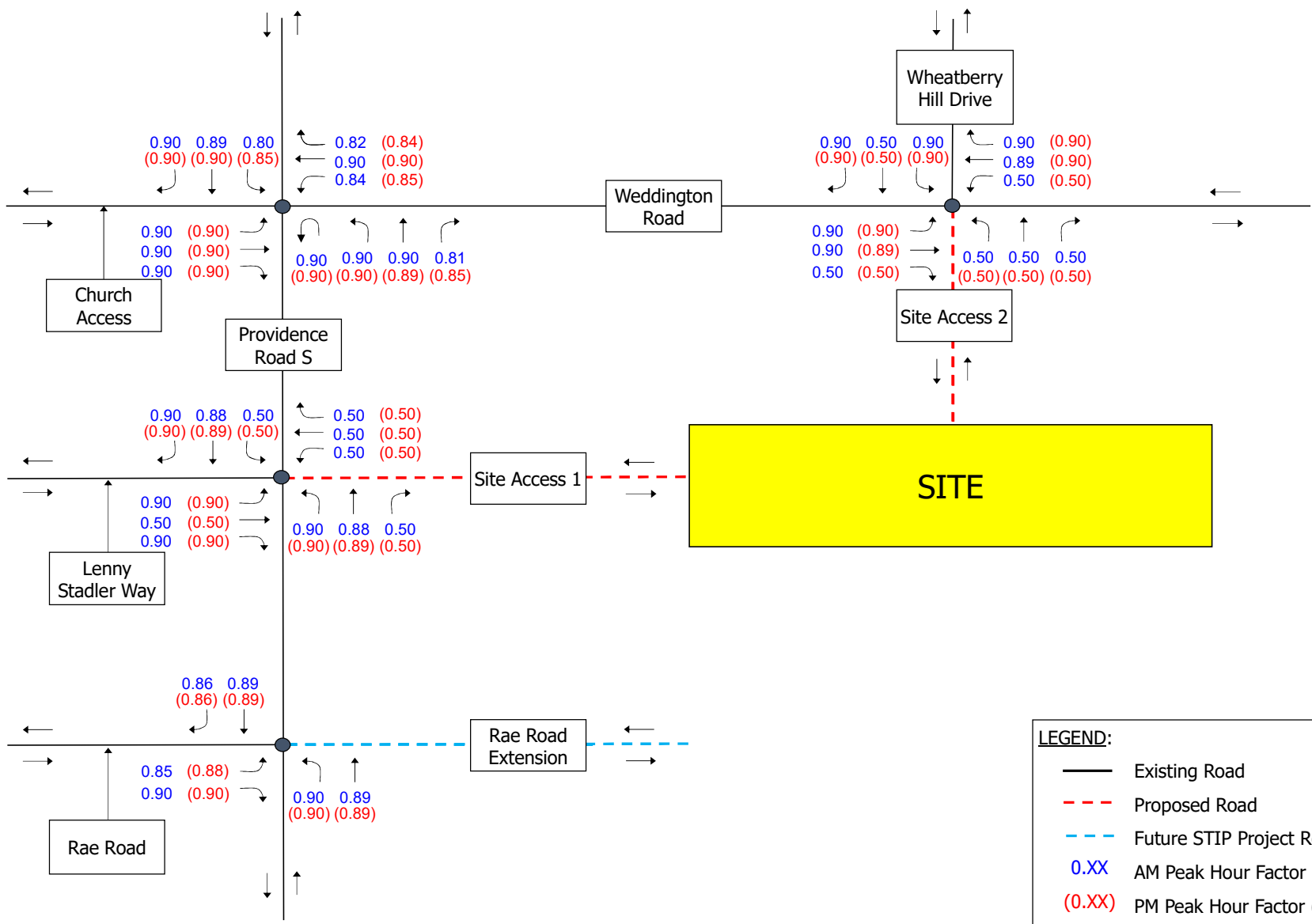
**LEGEND:**

- Existing Road
- - - Proposed Road
- - - Future STIP Project Road
- 0.XX AM Peak Hour Factor (PHF)
- (0.XX) PM Peak Hour Factor (PHF)



**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 Middle School Peak Hour Factors

Figure E-2



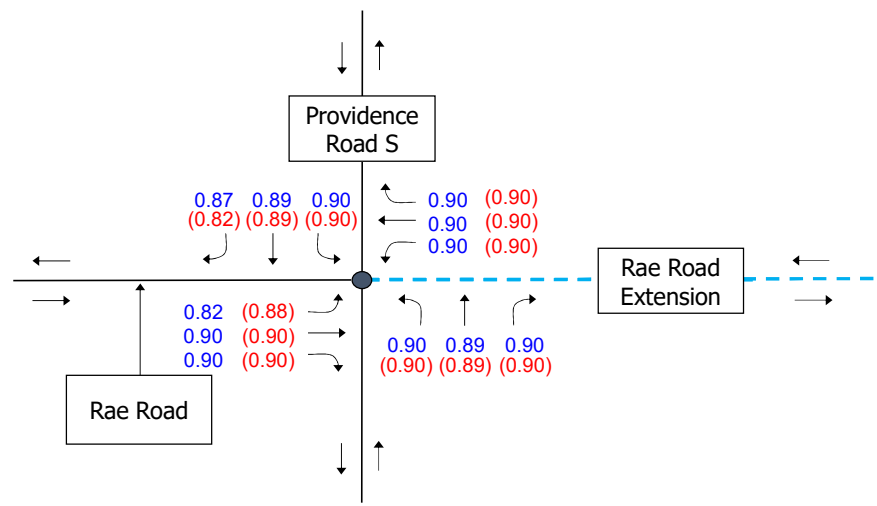
**LEGEND:**

- Existing Road
- - - Proposed Road
- - - Future STIP Project Road
- 0.XX AM Peak Hour Factor (PHF)
- (0.XX) PM Peak Hour Factor (PHF)



**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 Elementary School Peak Hour Factors

Figure E-3



**LEGEND:**

- Existing Road
- - - Proposed Road
- - - Future STIP Project Road
- 0.XX AM Peak Hour Factor (PHF)
- (0.XX) PM Peak Hour Factor (PHF)



**Liberty Classical Academy**  
**Traffic Impact Analysis**  
 Horizon Year Peak Hour Factors

Figure E-4

## **Appendix F – MSTA School Calculator**

# MSTA School Traffic Calculations

AM and PM Peak Traffic Estimates  
(These numbers do not reflect peak hour traffic volumes)

School Name: Liberty Classical Academy - Elementary School

Type: **Urban Charter**

Version: 04012021

AM Cars / Student	PM Cars / Student	Avg. Car Length	PM At one Time
55.94%	39.15%	22.19	48.67%
52.91%	47.50%	22.19	46.12%
50.08%	47.58%	22.83	55.71%

MSTA School Queue Input					Calculations					
Grade Level	Student Population	Number of Buses	Staff Members	Student Drivers	PM Total Vehicles	PM Peak Vehicles	Average Queue Length	Total AM Trips	Total PM Trips	High Demand Length
K - 10	400	6	50		157	77	1709	504	370	30%
11th										
12th										
Sum >>	400	6	50		157	77	1709	504	370	2221

513

Grade K-10								
AM Trips Generated					PM Trips Generated			
Direction	Parents	Buses	Staff	Trips	Parents	Buses	Staff	Trips
IN	224	6	50	280	157			157
OUT	224			224	157	6	50	213
AM K-10 Trips				504	PM K-10 Trips			370

ADT
874

**NOTES**

- Average Queue Length does not include an alternative traffic pattern required for high traffic demand days which is usually 30% additional length.
- Average Queue Length does not include the Student Loading Zone.
- Peak traffic volumes at schools normally occur within a 30-minute time period. (justifying a PHF of 0.5)

AM Trips Generated									PM Trips Generated			
Direction	Parents	Buses	Staff	Trips	Parents	Buses	Staff	Trips				
IN												
OUT												
AM 11th Trips					PM 11th Trips							

AM Trips Generated									PM Trips Generated			
Direction	Parents	Buses	Staff	Trips	Parents	Buses	Staff	Trips				
IN												
OUT												
AM 12th Trips					PM 12th Trips							

All AM TRIPS	In	280
	Out	224
	Total	504

All PM TRIPS	In	157
	Out	213
	Total	370

# MSTA School Traffic Calculations

## AM and PM Peak Traffic Estimates

(These numbers do not reflect peak hour traffic volumes)

School Name: Liberty Classical Academy - High School

Type: **Urban Charter**

Version: 04012021

AM Cars / Student	PM Cars / Student	Avg. Car Length	PM At one Time
55.94%	39.15%	22.19	48.67%
52.91%	47.50%	22.19	46.12%
50.08%	47.58%	22.83	55.71%

MSTA School Queue Input					Calculations					
Grade Level	Student Population	Number of Buses	Staff Members	Student Drivers	PM Total Vehicles	PM Peak Vehicles	Average Queue Length	Total AM Trips	Total PM Trips	High Demand Length
<b>K - 10</b>	300	4	37		118	58	1287	377	277	30%
<b>11th</b>	150	3	17	48	53	25	555	175	174	721
<b>12th</b>	150	2	15	128	21	12	274	163	187	357
Sum >>	600	9	69	176	192	95	2116	714	638	2751

636

Grade K-10									
AM Trips Generated					PM Trips Generated				
Direction	Parents	Buses	Staff	Trips	Parents	Buses	Staff	Trips	
IN	168	4	37	209	118			118	
OUT	168			168	118	4	37	159	
AM K-10 Trips				377	PM K-10 Trips				277

<b>ADT</b>
654

Grade 11											
AM Trips Generated					PM Trips Generated						
Direction	Parents	Buses	Staff	Student Dvr	Trips	Parents	Buses	Staff	Student Dvr	Trips	
IN	58	3	17	39	117	53				53	
OUT	58				58	53	3	17	48	121	
AM 11th Trips					175	PM 11th Trips					174

349

Grade 12											
AM Trips Generated					PM Trips Generated						
Direction	Parents	Buses	Staff	Student Dvr	Trips	Parents	Buses	Staff	Student Dvr	Trips	
IN	21	2	15	103	141	21				21	
OUT	21				21	21	2	15	128	166	
AM 12th Trips					163	PM 12th Trips					187

350

<b>All AM TRIPS</b>	In	467
	Out	247
	Total	714

<b>All PM TRIPS</b>	In	192
	Out	446
	Total	638

1352
------

**NOTES**

- Average Queue Length does not include an alternative traffic pattern required for high traffic demand days which is usually 30% additional length.
- Average Queue Length does not include the Student Loading Zone.
- Peak traffic volumes at schools normally occur within a 30-minute time period. (justifying a PHF of 0.5)

## MSTA School Traffic Calculations

AM and PM Peak Traffic Estimates  
(These numbers do not reflect peak hour traffic volumes)

School Name: Liberty Classical Academy - Middle School

Type: **Urban Charter**

Version: 04012021

AM Cars / Student	PM Cars / Student	Avg. Car Length	PM At one Time
55.94%	39.15%	22.19	48.67%
52.91%	47.50%	22.19	46.12%
50.08%	47.58%	22.83	55.71%

MSTA School Queue Input					Calculations					
Grade Level	Student Population	Number of Buses	Staff Members	Student Drivers	PM Total Vehicles	PM Peak Vehicles	Average Queue Length	Total AM Trips	Total PM Trips	High Demand Length
K - 10	500	7	62		196	96	2130	628	461	30%
11th										
12th										
Sum >>	500	7	62		196	96	2130	628	461	2769

639

Grade K-10									
AM Trips Generated					PM Trips Generated				
Direction	Parents	Buses	Staff	Trips	Parents	Buses	Staff	Trips	
IN	280	7	62	349	196			196	
OUT	280			280	196	7	62	265	
				AM K-10 Trips					PM K-10 Trips
				628					461

ADT
1089

Grade 11-12									
AM Trips Generated					PM Trips Generated				
Direction	Parents	Buses	Staff	Trips	Parents	Buses	Staff	Trips	
IN									
OUT									
				AM 11th Trips					PM 11th Trips
				0					0

Grade 11-12									
AM Trips Generated					PM Trips Generated				
Direction	Parents	Buses	Staff	Trips	Parents	Buses	Staff	Trips	
IN									
OUT									
				AM 12th Trips					PM 12th Trips
				0					0

All AM TRIPS	In	349
	Out	280
	Total	628

All PM TRIPS	In	196
	Out	265
	Total	461

**NOTES**

- Average Queue Length does not include an alternative traffic pattern required for high traffic demand days which is usually 30% additional length.
- Average Queue Length does not include the Student Loading Zone.
- Peak traffic volumes at schools normally occur within a 30-minute time period. (justifying a PHF of 0.5)



## **Appendix G – Traffic Management Plans**

Liberty Classical Academy  
April 11, 2023

### Liberty Classical Academy High School Transportation Management Plan (TMP)

The Transportation Management Plan (TMP) informs staff, parents, and visitors how to efficiently implement school traffic operations. This document may be shared with neighboring residences for informational purposes. It provides a traffic flow pattern and layout for average and high demand days. School traffic operations, such as short-term parking, loading, and unloading operations, should occur only within the designated areas – see **Figure 7-3**.

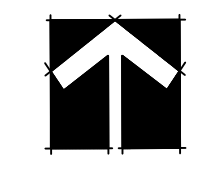
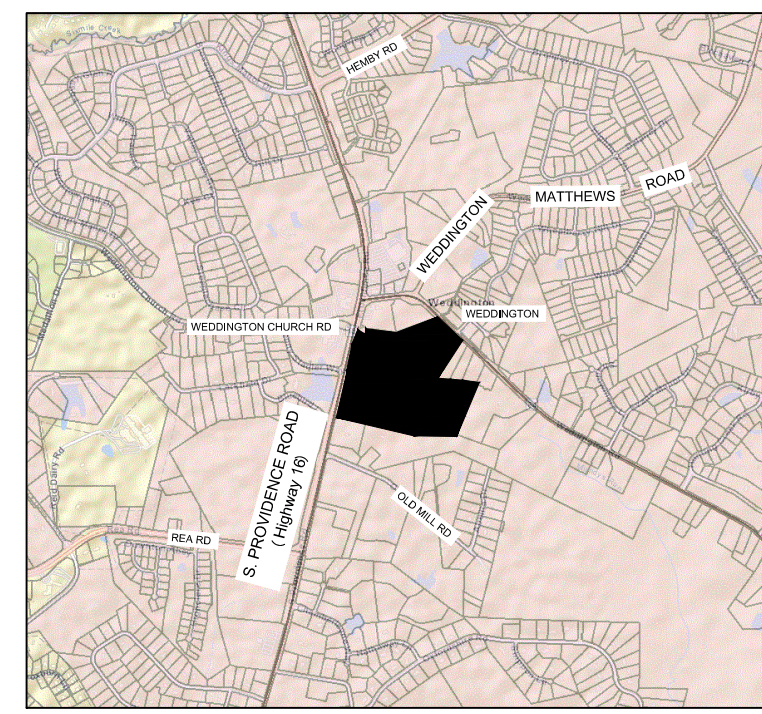
- Parents should follow the provided plan and only drop off and pick up children in designated unloading / loading zones located on school property.
- Parents should not enter the campus 30 minutes prior to the AM or PM bell.
- Parents should enter the school property via the site access off Weddington Road (Site Access 2) – see **Figure 7-3**.
- Upon entering via Site Access 2, parents should continue southwest, turn left at the roundabout, and continue travelling south and west towards the library.
- Upon reaching the library, parents should turn right (north) towards unloading / loading zone.
- After performing the right-turning maneuver, parents should double-stack (following the queue shown in **Figure 7-3**) until reaching the stop line between the middle school and high school buildings.
- Upon reaching the stop line parents are to wait until a school official directs them to pull forward into one single stack lane to approach the unloading / loading zones.
- For both unloading and loading, a school official will direct the first five (5) queued vehicles to pull forward and park in the unloading / loading zones.
- A school official will supervise unloading / loading to ensure the students' safety and help expedite the process.
- When a student needs longer time to unload / load, or the student is to be picked up early, parents should use the short-term visitors parking spaces located in front of the high school, south of the unloading / loading zone.
- After dropping off / picking up students, parents should travel towards the roundabout where they will turn right onto Site Access 2. Parents will then exit onto Weddington Road via Site Access 2 – see **Figure 7-3**.
- If needed, implement an "Advanced Identification" loading process during the PM student loading. To better organize and speed-up the student loading, this process will require the placement of a loading assistant (staff member, parent volunteer, or identified student patrol) prior to the student loading zone. It will be the loading assistant's responsibility to determine the name of the next student to be loaded. This can be accomplished by having parents display their student's name on a flash card (placed in the car's windshield) or by asking the parent. Once the information is obtained, it is forwarded (typically by walkie-talkie or megaphone) to a different loading assistant who has access to the students. When parents reach the loading zone, the student should be waiting next to the curb, ready to enter the vehicle. A third loading assistant should be stationed at the loading zone to supervise and ensure safe operations.
- All walkers and bicyclists should be released prior to the beginning of carpool operations.
- Visitors parking at the school should enter / exit via Site Access 2.
- Faculty / Buses should enter / exit via Site Access 1 (off Providence Road).
- Staff should enter / exit prior to / following parent unloading / loading operations.
- Student drivers should enter / exit via Site Access 2.

- (Arriving) Student drivers should travel westbound through the roundabout onto Site Access 1 where they will turn left (south) into the student parking lot.
- (Departing) Student drivers should turn right onto Site Access 1 (from the student parking lot) towards the roundabout, travel through the roundabout (northeast) onto Site Access 2, then exit onto Weddington Road.

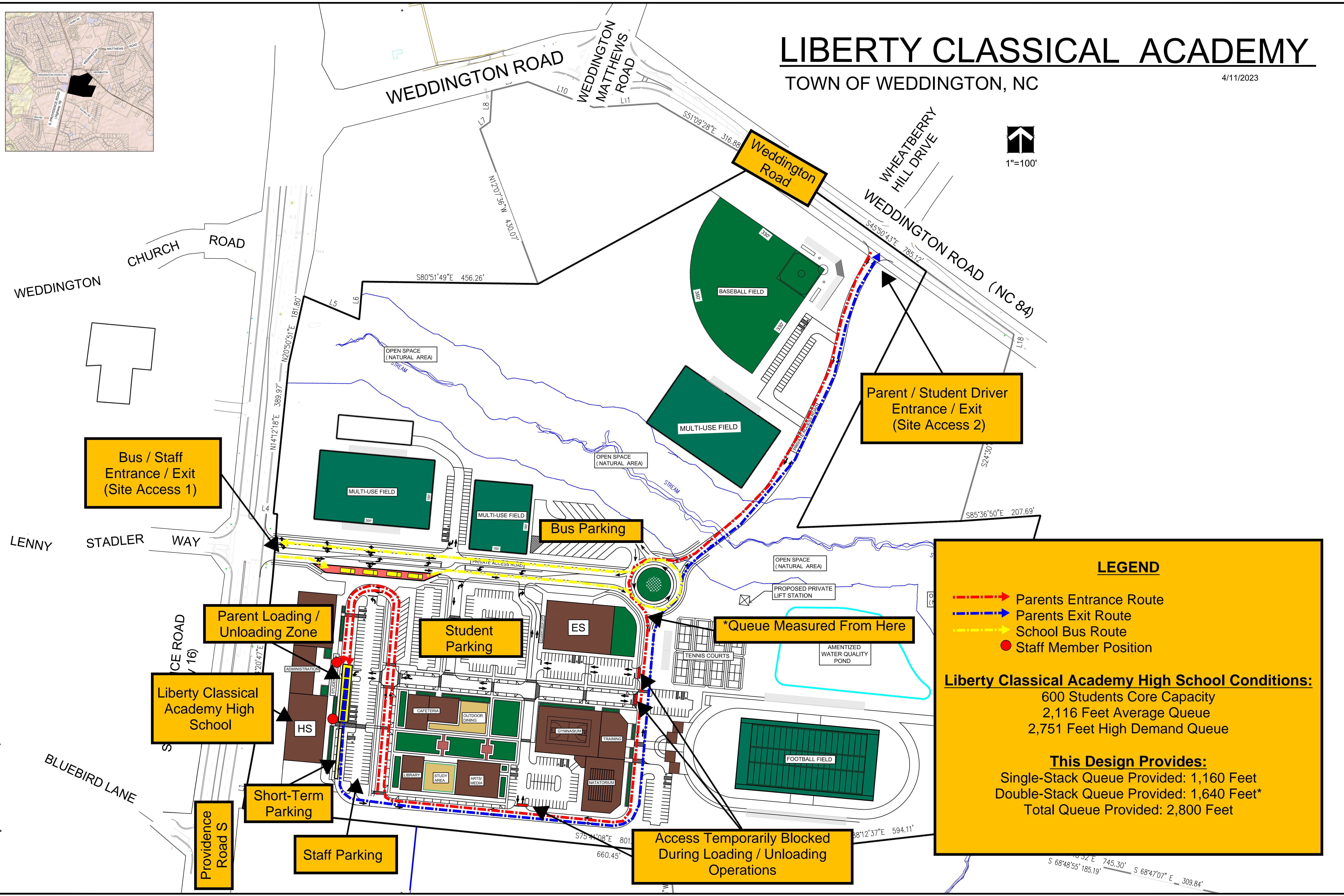
# LIBERTY CLASSICAL ACADEMY

TOWN OF WEDDINGTON, NC

4/11/2023



1"=100'



Parent / Student Driver Entrance / Exit (Site Access 2)

Bus / Staff Entrance / Exit (Site Access 1)

Bus Parking

Student Parking

Parent Loading / Unloading Zone

Liberty Classical Academy High School

Short-Term Parking

Staff Parking

\*Queue Measured From Here

Access Temporarily Blocked During Loading / Unloading Operations

**LEGEND**

- - - - - Parents Entrance Route
- - - - - Parents Exit Route
- - - - - School Bus Route
- Staff Member Position

**Liberty Classical Academy High School Conditions:**

- 600 Students Core Capacity
- 2,116 Feet Average Queue
- 2,751 Feet High Demand Queue

**This Design Provides:**

- Single-Stack Queue Provided: 1,160 Feet
- Double-Stack Queue Provided: 1,640 Feet\*
- Total Queue Provided: 2,800 Feet

Liberty Classical Academy  
April 10, 2023

### Liberty Classical Academy Middle School Transportation Management Plan (TMP)

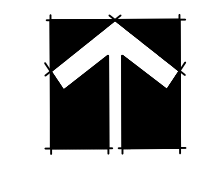
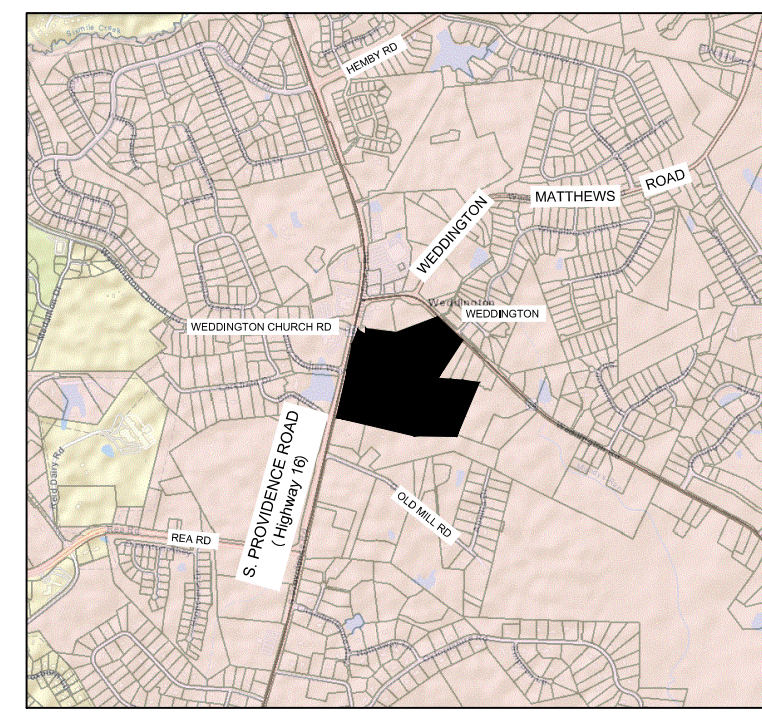
The Transportation Management Plan (TMP) informs staff, parents, and visitors how to efficiently implement school traffic operations. This document may be shared with neighboring residences for informational purposes. It provides a traffic flow pattern and layout for average and high demand days. School traffic operations, such as short-term parking, loading, and unloading operations, should occur only within the designated areas – see **Figure 7-4**.

- Parents should follow the provided plan and only drop off and pick up children in designated unloading / loading zones located on school property.
- Parents should not enter the campus 30 minutes prior to the AM or PM bell.
- Parents should enter the school property via the site access off Weddington Road (Site Access 2) – see **Figure 7-4**.
- Upon entering via Site Access 2, parents should continue southwest, turn left at the roundabout, and continue travelling south and west towards the library.
- Upon reaching the library, parents should turn right (north) towards unloading / loading zone.
- After performing the right-turning maneuver, parents should double-stack (following the queue shown in **Figure 7-4**) until reaching the stop line between the middle school and high school buildings.
- Upon reaching the stop line parents are to wait until a school official directs them to pull forward into one single stack lane to approach the unloading / loading zones.
- For both unloading and loading, a school official will direct the first five (5) queued vehicles to pull forward and park in the unloading / loading zones.
- A school official will supervise unloading / loading to ensure the students' safety and help expedite the process.
- When a student needs longer time to unload / load, or the student is to be picked up early, parents should use the short-term visitors parking spaces located in front of the high school, south of the unloading / loading zone.
- After dropping off / picking up students, parents should travel towards the roundabout where they will turn right onto Site Access 2. Parents will then exit onto Weddington Road via Site Access 2 – see **Figure 7-4**.
- If needed, implement an "Advanced Identification" loading process during the PM student loading. To better organize and speed-up the student loading, this process will require the placement of a loading assistant (staff member, parent volunteer, or identified student patrol) prior to the student loading zone. It will be the loading assistant's responsibility to determine the name of the next student to be loaded. This can be accomplished by having parents display their student's name on a flash card (placed in the car's windshield) or by asking the parent. Once the information is obtained, it is forwarded (typically by walkie-talkie or megaphone) to a different loading assistant who has access to the students. When parents reach the loading zone, the student should be waiting next to the curb, ready to enter the vehicle. A third loading assistant should be stationed at the loading zone to supervise and ensure safe operations.
- All walkers and bicyclists should be released prior to the beginning of carpool operations.
- Visitors parking at the school should enter / exit via Site Access 2.
- Faculty / Buses should enter / exit via Site Access 1 (off Providence Road).
- Staff should enter / exit prior to / following parent unloading / loading operations.

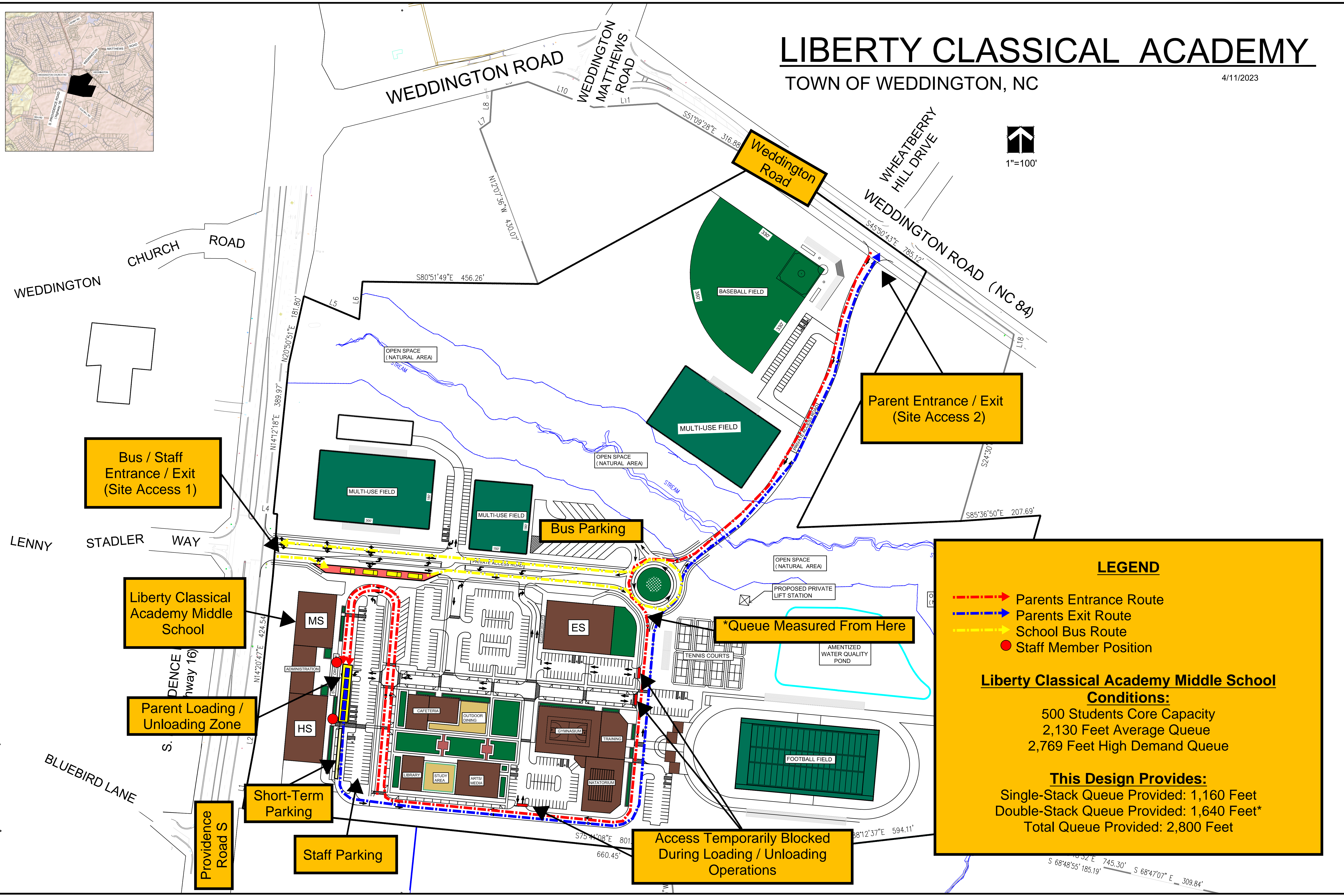
# LIBERTY CLASSICAL ACADEMY

TOWN OF WEDDINGTON, NC

4/11/2023



1"=100'



Bus / Staff Entrance / Exit (Site Access 1)

Parent Entrance / Exit (Site Access 2)

Liberty Classical Academy Middle School

Parent Loading / Unloading Zone

Short-Term Parking

Staff Parking

Bus Parking

\*Queue Measured From Here

Access Temporarily Blocked During Loading / Unloading Operations

**LEGEND**

- - - - - Parents Entrance Route
- - - - - Parents Exit Route
- - - - - School Bus Route
- Staff Member Position

**Liberty Classical Academy Middle School Conditions:**

- 500 Students Core Capacity
- 2,130 Feet Average Queue
- 2,769 Feet High Demand Queue

**This Design Provides:**

- Single-Stack Queue Provided: 1,160 Feet
- Double-Stack Queue Provided: 1,640 Feet\*
- Total Queue Provided: 2,800 Feet

### Liberty Classical Academy Elementary School Transportation Management Plan (TMP)

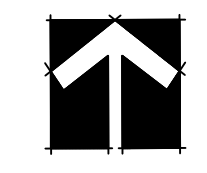
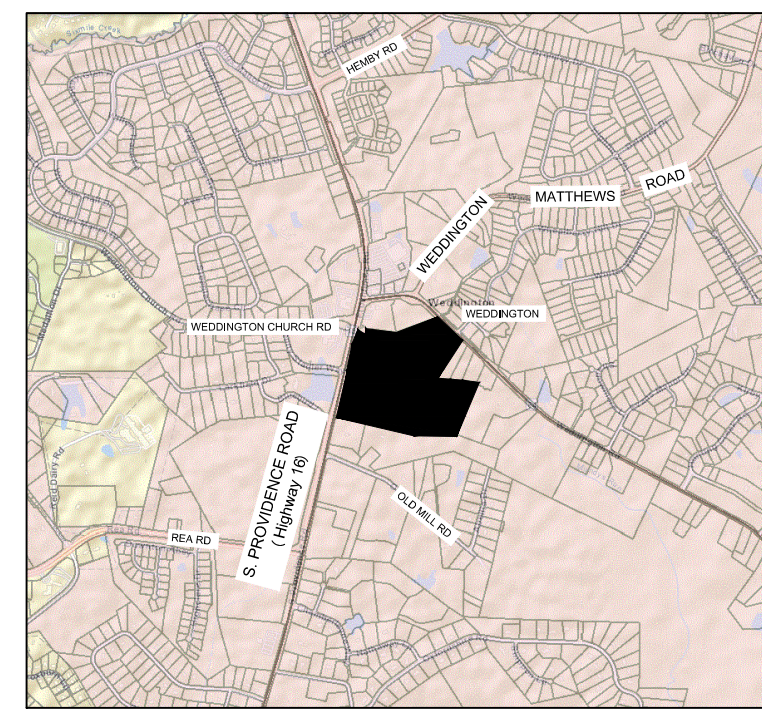
The Transportation Management Plan (TMP) informs staff, parents, and visitors how to efficiently implement school traffic operations. This document may be shared with neighboring residences for informational purposes. It provides a traffic flow pattern and layout for average and high demand days. School traffic operations, such as short-term parking, loading, and unloading operations, should occur only within the designated areas – see **Figure 7-5**.

- Parents should follow the provided plan and only drop off and pick up children in designated unloading / loading zones located on school property.
- Parents should not enter the campus 30 minutes prior to the AM or PM bell.
- Parents should enter the school property via the site access off Weddington Road (Site Access 2) – see **Figure 7-5**.
- Upon entering via Site Access 2, parents should continue southwest, turn left at the roundabout, and continue travelling south and west towards the library.
- Upon reaching the library, parents should turn right (north) towards cafeteria.
- Upon reaching the cafeteria, parents should turn right (east) towards unloading / loading zone.
- After performing the right-turning maneuver, parents should single-stack (following the queue shown in **Figure 7-5**) until reaching the stop line near the elementary school building.
- Upon reaching the stop line parents are to wait until a school official directs them to pull forward into one single stack lane to approach the unloading / loading zones.
- For both unloading and loading, a school official will direct the first five (5) queued vehicles to pull forward and park in the unloading / loading zones.
- A school official will supervise unloading / loading to ensure the students' safety and help expedite the process.
- When a student needs longer time to unload / load, or the student is to be picked up early, parents should use the short-term visitors parking spaces located in front of the elementary school.
- After dropping off / picking up students, parents should travel towards the roundabout where they will turn right onto Site Access 2. Parents will then exit onto Weddington Road via Site Access 2 – see **Figure 7-5**.
- If needed, implement an "Advanced Identification" loading process during the PM student loading. To better organize and speed-up the student loading, this process will require the placement of a loading assistant (staff member, parent volunteer, or identified student patrol) prior to the student loading zone. It will be the loading assistant's responsibility to determine the name of the next student to be loaded. This can be accomplished by having parents display their student's name on a flash card (placed in the car's windshield) or by asking the parent. Once the information is obtained, it is forwarded (typically by walkie-talkie or megaphone) to a different loading assistant who has access to the students. When parents reach the loading zone, the student should be waiting next to the curb, ready to enter the vehicle. A third loading assistant should be stationed at the loading zone to supervise and ensure safe operations.
- All walkers and bicyclists should be released prior to the beginning of carpool operations.
- Visitors parking at the school should enter / exit via Site Access 2.
- Faculty / Buses should enter / exit via Site Access 1 (off Providence Road).
- Staff should enter / exit prior to / following parent unloading / loading operations.

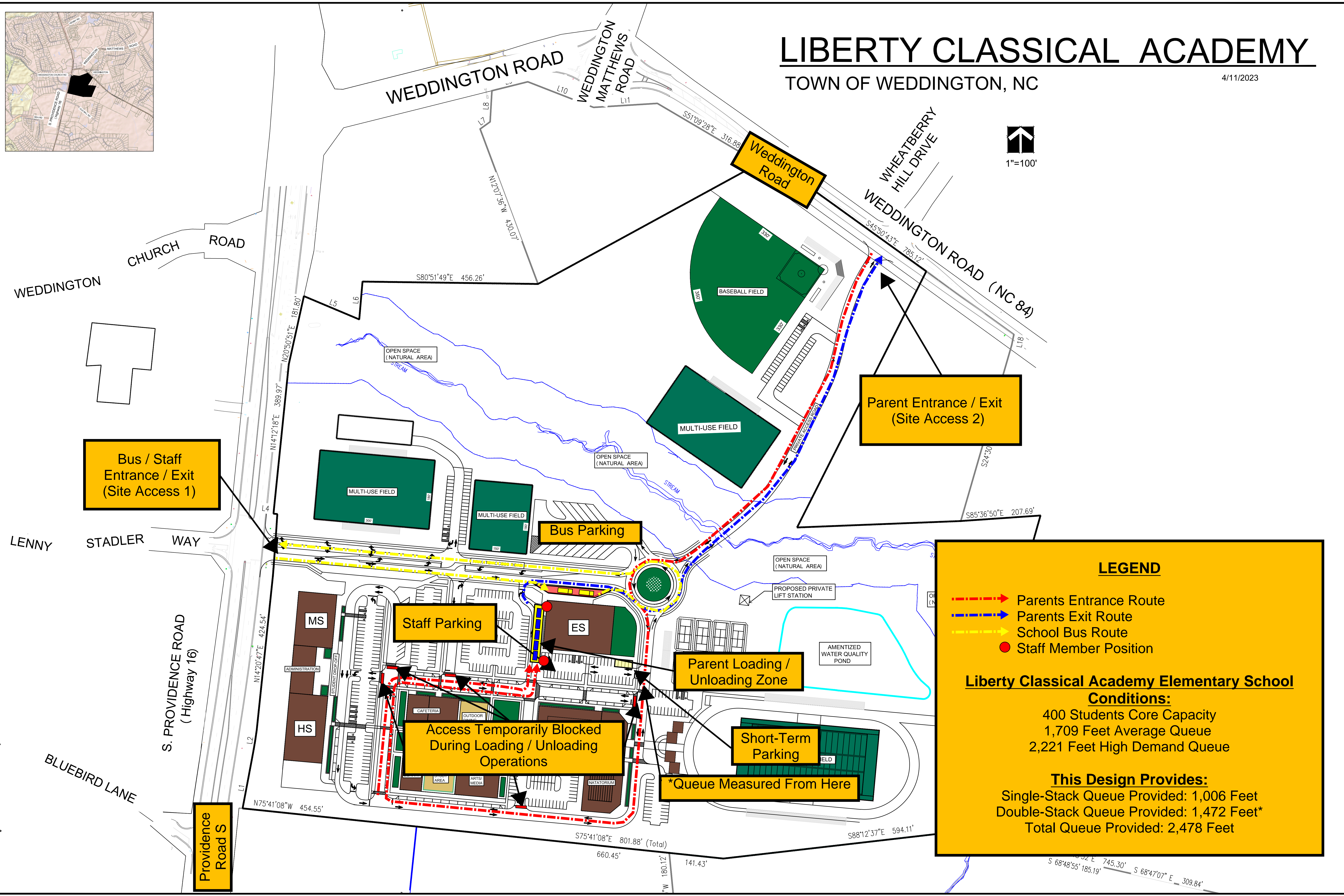
# LIBERTY CLASSICAL ACADEMY

TOWN OF WEDDINGTON, NC

4/11/2023



1"=100'



**Bus / Staff Entrance / Exit (Site Access 1)**

**Parent Entrance / Exit (Site Access 2)**

**Bus Parking**

**Staff Parking**

**Parent Loading / Unloading Zone**

**Access Temporarily Blocked During Loading / Unloading Operations**

**Short-Term Parking**

**\*Queue Measured From Here**

**Providence Road S**

**LEGEND**

- - - - - Parents Entrance Route
- - - - - Parents Exit Route
- - - - - School Bus Route
- Staff Member Position

**Liberty Classical Academy Elementary School Conditions:**

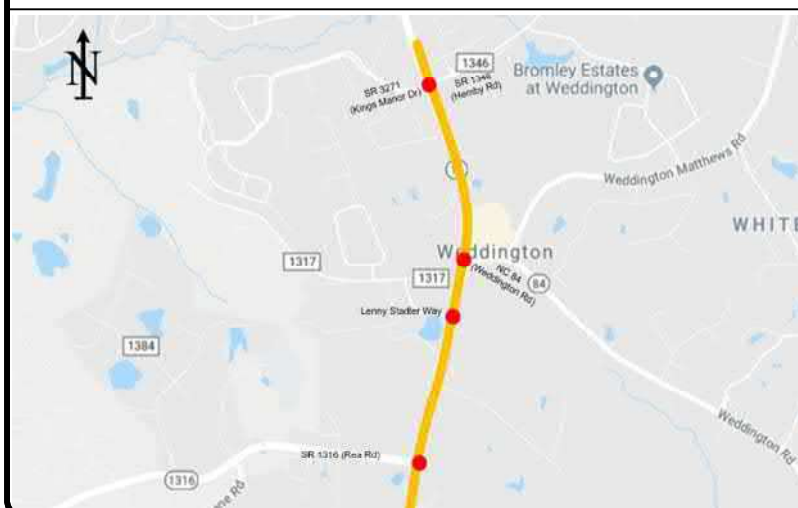
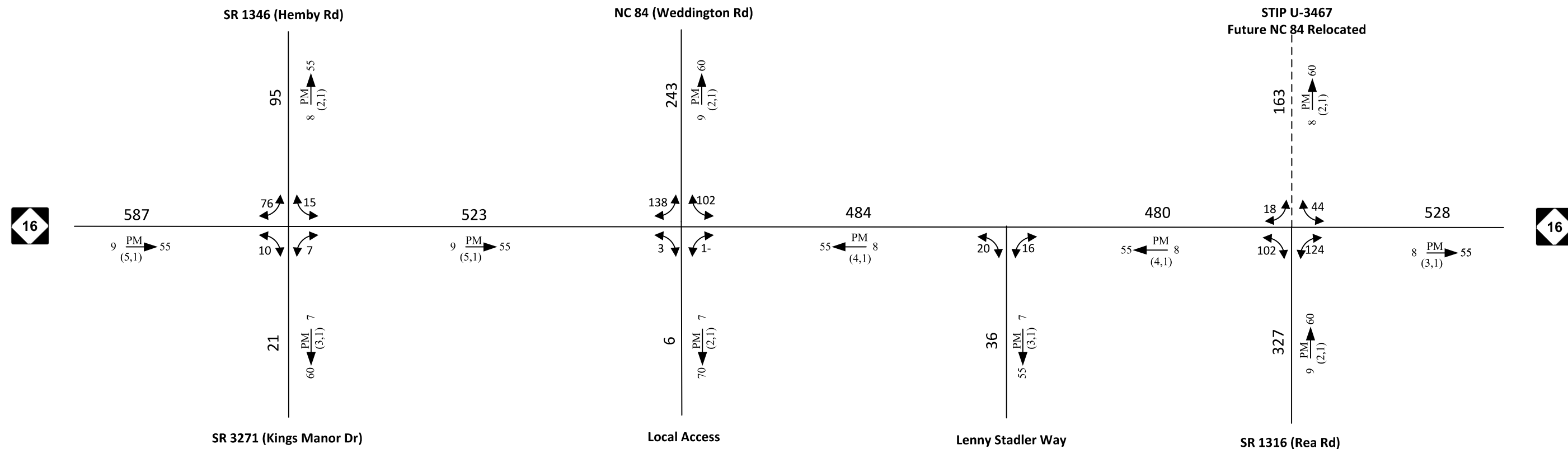
- 400 Students Core Capacity
- 1,709 Feet Average Queue
- 2,221 Feet High Demand Queue

**This Design Provides:**

- Single-Stack Queue Provided: 1,006 Feet
- Double-Stack Queue Provided: 1,472 Feet\*
- Total Queue Provided: 2,478 Feet



## **Appendix H – STIP Project Information**



**2040**

AVERAGE ANNUAL DAILY TRAFFIC

Build

Sheet 1 of 1

**LEGEND**

- ### No. of Vehicles Per Day in 100s
- 1- Less than 50 vpd
- X Movement Prohibited
- $\frac{K}{(d, t)}$  Design Hour Factor (%)
- PM PM Peak Period
- D Peak Hour Directional Split (%)
- Indicates Direction of D
- (d, t) Duals, TT-STs (%)

TIP: N/A	WBS: 34263.1.1
COUNTY: Union	DIVISION: 10
DATE: September 2018	
PREPARED BY: <b>RK&amp;K</b>	
LOCATION: Weddington, NC	
PROJECT: FS-1810D: NC 16 from SR 1316 (Rea Road) to the Mecklenburg County Line	

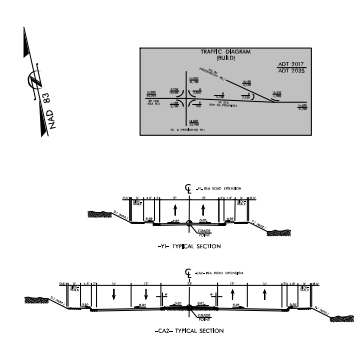
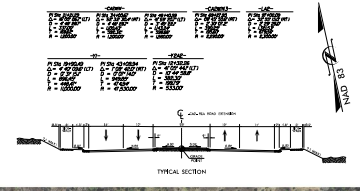


**DESIGN PUBLIC MEETING MAP**  
 PROJECT 39019.L1 (U-3467)  
 F.A. PROJECT STP-1316(10)  
 NC 84  
 NC 16 TO SR 1066 (WAXHAW-INDIAN TRAIL ROAD) IN WESLEY CHAPEL  
 UNION COUNTY

**PREFERRED ALTERNATE CA2**  
 ROLL 1 OF 3      JUNE 2017

**U-3467 DESIGN DATA**  
 Functional Class = Major Collector  
 Design Speed = 50 mph  
 Max. Superelev. = 0.04

**NC ONMAP PHOTO**  
 Download Date: SPRING 2017



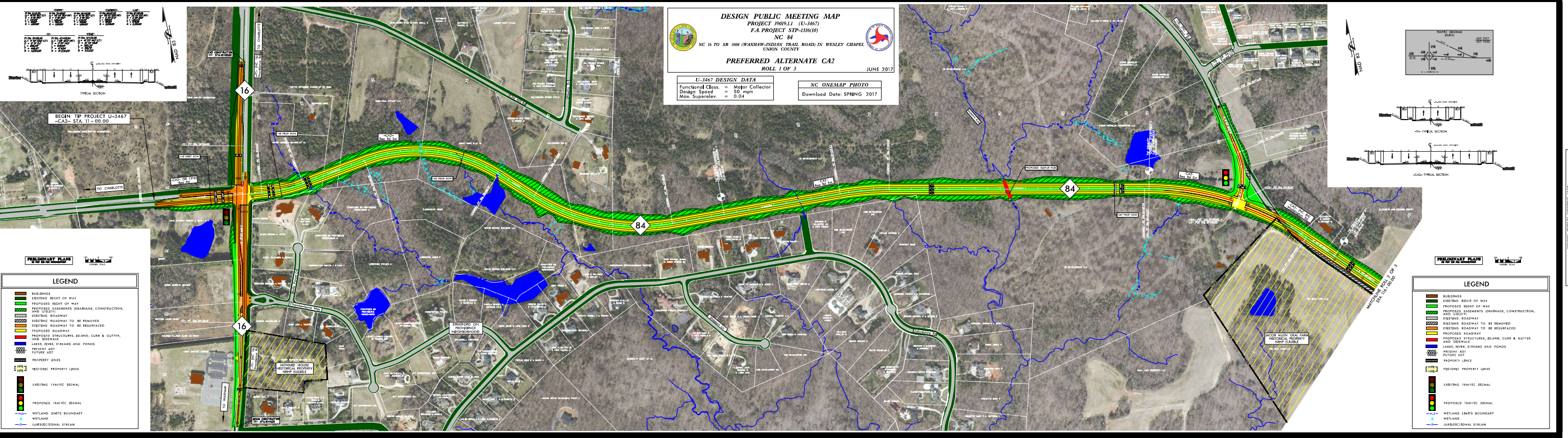
BEGIN TIP PROJECT U-3467  
 -CA2- STA. 11+00.00

**LEGEND**

- BUILDINGS
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- PROPOSED EASEMENTS DRAINAGE, CONSTRUCTION, AND UTILITIES
- EXISTING ROADWAY
- EXISTING ROADWAY TO BE REMOVED
- EXISTING ROADWAY TO BE RESURFACED
- PROPOSED ROADWAY
- PROPOSED STRUCTURES, ISLAND, CURB & GUTTER, AND SIDEWALK
- LAKES, RIVER, STREAMS AND PONDS
- PRESENT ASP
- FUTURE ASP
- PROPERTY LINES
- HISTORIC PROPERTY LINES
- EXISTING TRAFFIC SIGNAL
- PROPOSED TRAFFIC SIGNAL
- WETLAND LIMITS BOUNDARY
- WETLAND
- JURISDICTIONAL STREAM

**LEGEND**

- BUILDINGS
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- PROPOSED EASEMENTS DRAINAGE, CONSTRUCTION, AND UTILITIES
- EXISTING ROADWAY
- EXISTING ROADWAY TO BE REMOVED
- EXISTING ROADWAY TO BE RESURFACED
- PROPOSED ROADWAY
- PROPOSED STRUCTURES, ISLAND, CURB & GUTTER, AND SIDEWALK
- LAKES, RIVER, STREAMS AND PONDS
- PRESENT ASP
- FUTURE ASP
- PROPERTY LINES
- HISTORIC PROPERTY LINES
- EXISTING TRAFFIC SIGNAL
- PROPOSED TRAFFIC SIGNAL
- WETLAND LIMITS BOUNDARY
- WETLAND
- JURISDICTIONAL STREAM



PREPARED BY: J. W. BARNETT, INC.  
 PROJECT NO.: 39019.L1  
 DATE: 06/20/17  
 SCALE: AS SHOWN  
 DRAWN BY: JWB  
 CHECKED BY: JWB  
 APPROVED BY: JWB

PREPARED BY: J. W. BARNETT, INC.  
 PROJECT NO.: 39019.L1  
 DATE: 06/20/17  
 SCALE: AS SHOWN  
 DRAWN BY: JWB  
 CHECKED BY: JWB  
 APPROVED BY: JWB