

# TRAFFIC IMPACT ANALYSIS

FOR

**1216 Rolesville Road**

LOCATED

IN

**ROLESVILLE, NC**

Prepared For:  
The Town of Rolesville

Prepared By:  
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*dba*

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FEBRUARY 2023

RKA Project No. 20498-007

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Reviewed By: JM

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**TRAFFIC IMPACT ANALYSIS**  
**1216 ROLESVILLE ROAD**  
**ROLESVILLE, NORTH CAROLINA**

**1. INTRODUCTION**

The contents of this report present the findings of the Traffic Impact Analysis (TIA) conducted for the proposed development to be located at 1216 Rolesville Road in Rolesville, North Carolina. The purpose of this study is to determine the potential impacts to the surrounding transportation system created by traffic generated by the proposed development, as well as recommend improvements to mitigate the impacts.

The proposed development is anticipated to be completed in 2028 and is assumed to consist of the following uses:

- 68 units Single-Family Attached Housing
- 30,000 square feet (sq. ft.) retail

The study analyzes traffic conditions during the weekday AM and PM peak hours for the following scenarios:

- 2022 Existing Traffic Conditions
- 2028 (build-out year plus one) No-Build Traffic Conditions
- 2028 (build-out year plus one) Build Traffic Conditions

**1.1. Site Location and Study Area**

The development is proposed to be located at 1216 Rolesville Road in Rolesville, North Carolina. Refer to Figure 1 for the site location map.

The study area for the TIA was determined through coordination with the North Carolina Department of Transportation (NCDOT) and the Town of Rolesville (Town) and consists of the following intersections:

- US 401 and E Young Street (Signalized)
- US 401 and U-Turn North of E Young Street (Signalized)
- US 401 and U-Turn South of E Young Street (Signalized)
- E Young Street and Quarry Road (Unsignalized)
- E Young Street and Rolesville High School Driveway (Unsignalized)
- Rolesville Road and Sunset Manor Drive/Site Drive 1 (Unsignalized)
- Rolesville Road and Fowler Road (Unsignalized)
- Rolesville Road and Site Drive 2 (Proposed unsignalized)

Refer to Appendix A for the approved scoping documentation.

## **1.2. Proposed Land Use and Site Access**

The proposed development is to be located on the west side of Rolesville Road, across from Sunset Manor Drive, at 1216 Rolesville Road in Rolesville, North Carolina. The development is anticipated to be completed in 2028 and is anticipated to consist of the following uses:

- 68 units Single-Family Attached Housing (LUC 215)
- 30,000 sq. ft. retail (LUC 822)

Access to the development is proposed to be provided via one full-movement driveway connection to Rolesville Road aligning with Sunset Manor Drive and one right-in/right-out (RIRO) driveway located approximately 275 feet (ft) to the south. A stub connection to the planned The Point development is also proposed.

Refer to the attached site location map and preliminary site plan.

**1.3. Adjacent Land Uses**

The proposed development is located in an area consisting primarily of farms, undeveloped land, and residential development. The southern portion of The Point development is currently under construction. According to the 2019 TIA prepared for The Point, the development is expected to build out by 2025. A stub connection is proposed to connect The Point to the north side of the proposed development. To be conservative, the connection was not considered in this study.

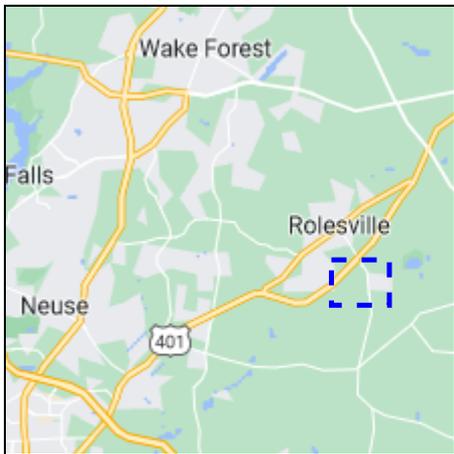
**1.4. Existing Roadways**

Existing lane configurations (number of traffic lanes on each intersection approach), storage capacities, and other intersection and roadway information within the study area are shown in Figure 3. Table 1 provides a summary of roadway information.

**Table 1: Existing Roadway Inventory**

Road Name	Route Number	Typical Cross Section	Speed Limit	2021 AADT (vpd)
Louisburg Rd	US 401	4-lane divided	55 mph	18,500
E Young Street/Rolesville Road	SR 1003	2-lane undivided	45 mph	5,400
Quarry Road	SR 2305	2-lane undivided	45 mph	1,100
Sunset Manor Drive	SR 5471	2-lane undivided	25 mph	310*
Fowler Road	SR 2308	2-lane undivided	45 mph	1,300

\*2022 AADT estimated assuming PM peak hour traffic represents 10% of daily traffic volume.



**LEGEND**

-  Existing Study Intersection
-  Existing Study Intersection
-  Proposed Site Access
-  Study Area

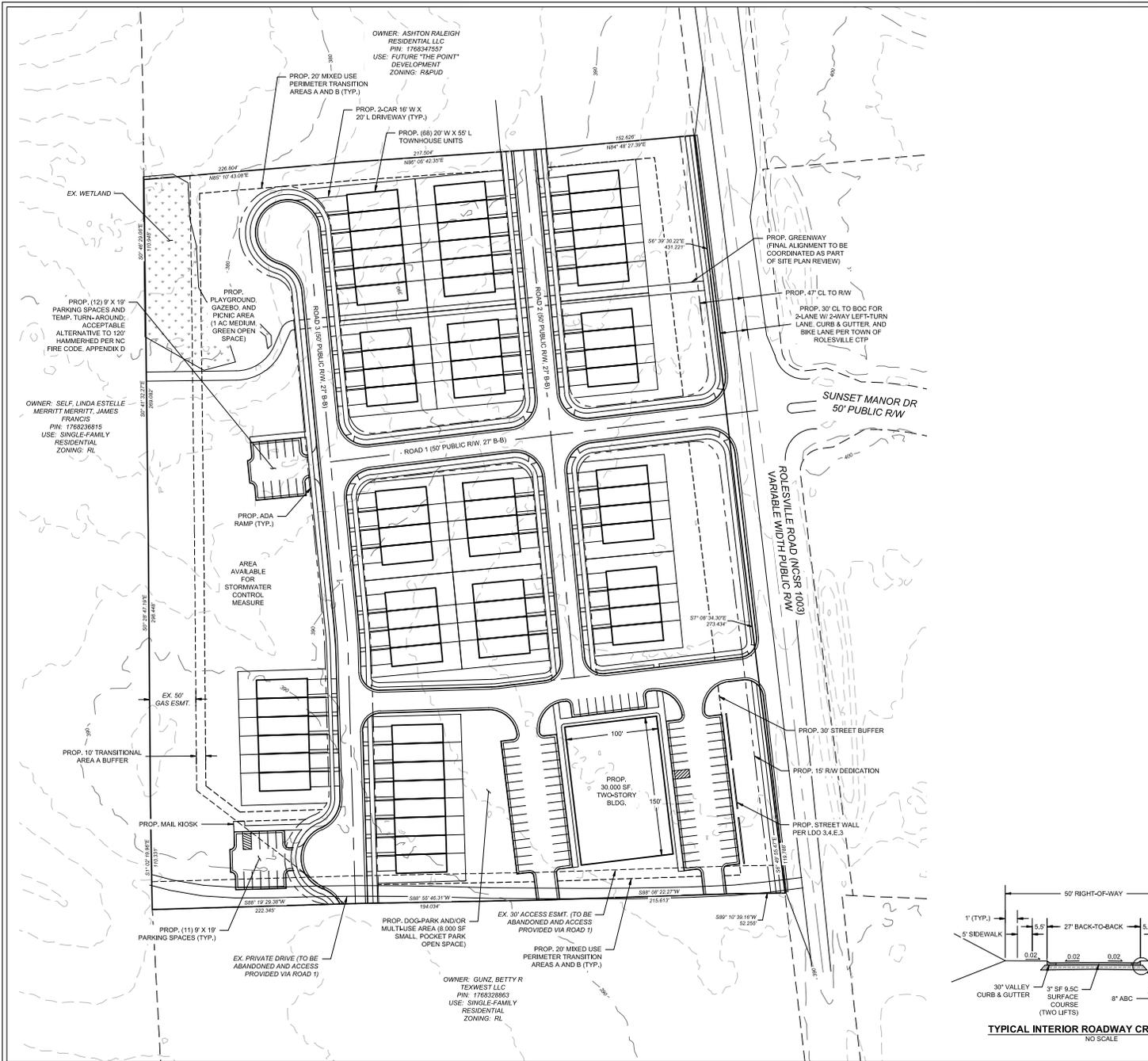


1216 Rolesville Road  
Rolesville, NC

Site Location Map

Scale: Not to Scale

Figure 1



SUMMARY INFORMATION	
DEVELOPMENT NAME: ROLESVILLE ROAD MIXED USE	
SITE ADDRESS: 1216 ROLESVILLE RD	
PIN NUMBER(S): 1768337689	
TOTAL ACREAGE: 11.8 AC	
EXISTING USE: VACANT	
PROPOSED USE: MIXED USE	
JURISDICTION: TOWN OF ROLESVILLE	
CURRENT ZONING DISTRICT: RL	
PROPOSED ZONING DISTRICT: NEIGHBORHOOD CENTER (NC)	
PROPOSED COMMERCIAL AREA: 30,000 SF	
PROPOSED MAX. BLDG. HEIGHT: 35' (TWO STORIES)	
SETBACKS (MIN/MAX):	
FRONT: 15'/100'	
SIDE: 10'/50'	
REAR: 10'/50'	
PARKING REQUIREMENTS:	
RETAIL SALES AND SERVICE:	
2.5 SPACES / 1,000 SF	
PARKING REQUIRED:	
2.5 SPACES / 1,000 SF = 30,000 SF = 75 SPACES	
PARKING PROVIDED:	
75 SPACES (2 ADA ACCESSIBLE)	
PROPOSED TOWNHOME UNITS: 68	
MAX. DENSITY: 8 UNITS/AC	
PROPOSED DENSITY: 5.6 UNITS/AC	
PROPOSED MAX. BLDG. HEIGHT: 35' (TWO STORIES)	
SETBACKS (MIN/MAX):	
FRONT: 15'/100'	
SIDE: 10'/50' (MIN. 30' BETWEEN STRUCTURES)	
REAR: 10'/50'	
PARKING REQUIREMENTS:	
DWELLING MULTIPLE FAMILY PARKING:	
2.0 SPACES PER UNIT PLUS 0.25 GUEST SPACE PER UNIT	
PARKING REQUIRED:	
2.0 SPACES * 68 UNITS + 0.25 SPACES * 68 UNITS = 153 SPACES	
PARKING PROVIDED:	
2 SPACES PER DRIVEWAY + 21 GUEST = 157 SPACES	
MAIL KIOSK PARKING PROVIDED:	
2 SPACES FOR MAIL KIOSK (1 IS ADA ACCESSIBLE)	
TOTAL PARKING PROVIDED:	
157 SPACES = 2 MAIL KIOSK SPACES = 159 SPACES (1 IS ADA ACCESSIBLE)	
REQUIRED OPEN SPACE: 1.77 AC (15%)	
PROPOSED OPEN SPACE: 3.97 AC (32.8%)	
USE BREAKDOWN:	
RIGHT-OF-WAY: 2.62 AC (22.2%)	
RESIDENTIAL LOTS: 3.72 AC (31.5%)	
COMMERCIAL AREA: 1.26 AC (10.6%)	
COMMON AREAS & OPEN SPACE: 4.20 AC (35.6%)	
ENGINEER:	
FLM ENGINEERING, INC.	
P.O. BOX 91727	
RALEIGH, NC 27675	
919.810.1051	

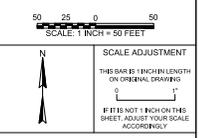


POST OFFICE BOX 91727  
 RALEIGH, NORTH CAROLINA 27675  
 PHONE: 919.810.1051  
 FIRM NC LICENSE NUMBER C-4222

REVISION HISTORY			
REV #	DESCRIPTION	DATE	BY
1	TOR COMMENTS	5/2/2022	FLM
2	ELIMINATE WESTERN STUB ROAD	7/12/2022	FLM

ORIGINAL PLAN SIZE: 24" X 36"

**PRELIMINARY PLANS**  
 DO NOT USE FOR CONSTRUCTION



ROLESVILLE RD MIXED USE  
 MA 22-05  
 1216 ROLESVILLE RD  
 ROLESVILLE, NC

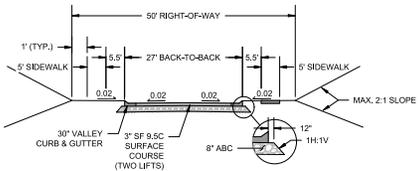
DATE:	02-21-2022
SCALE:	AS SHOWN
DESIGNED BY:	FLM
APPROVED BY:	
PROJECT NO.:	

SKETCH PLAN  
**C-1**  
 SHEET 1 OF 1

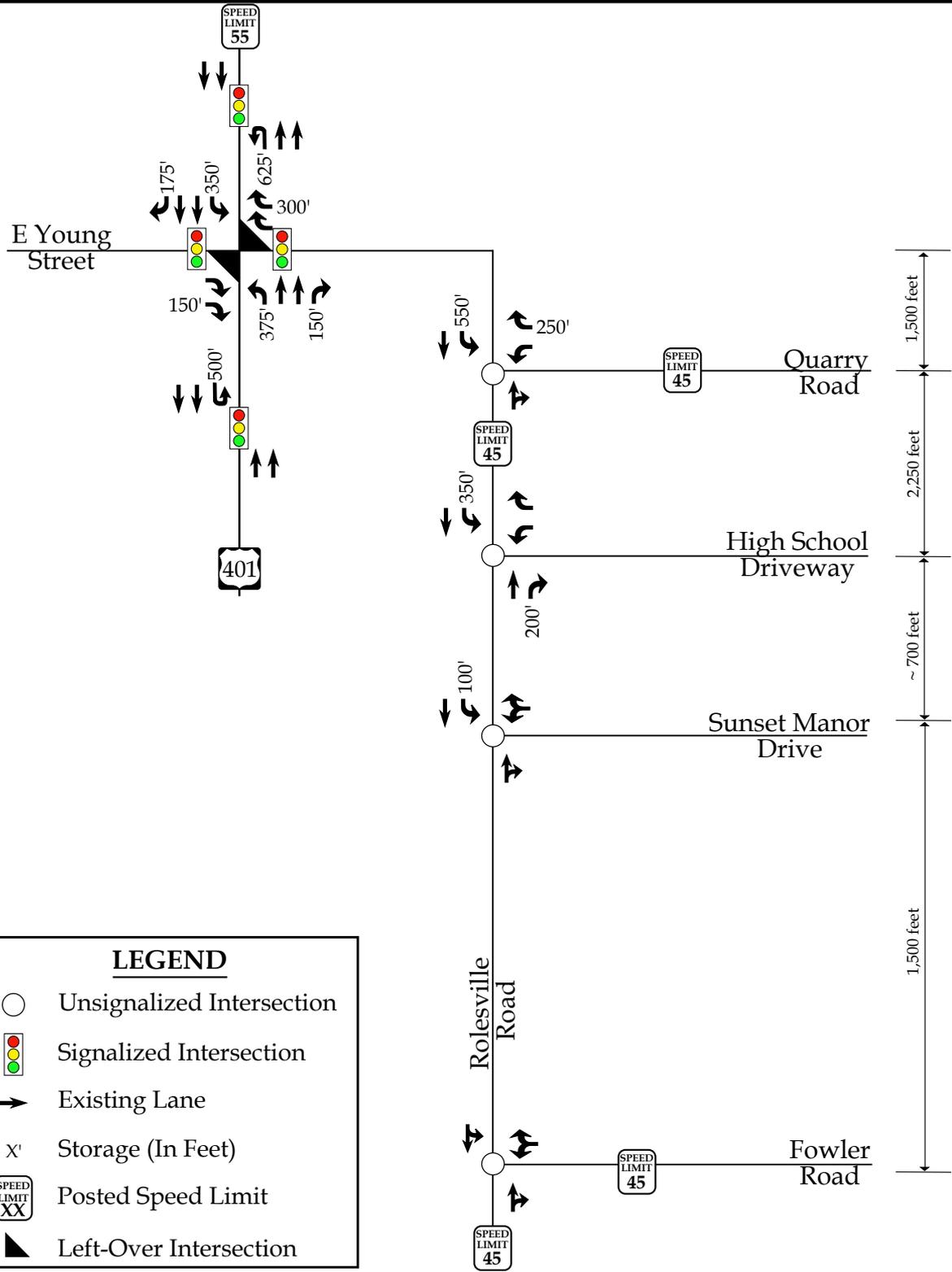
- NOTES**
- SKETCH PLAN BASED ON WAKE COUNTY GIS DATA PARCEL DATA.
  - THESE ARE NO AREAS WITHIN THE REGULATORY FLOODPLAIN AS SHOWN ON FEMA FIRM PANEL 3720185000J, EFFECTIVE 5/2/2008.
  - EXISTING TOPOGRAPHIC DATA SHOWN IS WAKE COUNTY GIS TWO-FOOT CONTOURS.

**LEGEND**

---	EX. PROPERTY LINE
---	EX. ADJACENT OWNERS
---	EX. BASEMENT
---	EX. MAJOR CONTOUR (10')
---	EX. MINOR CONTOUR (2')
---	PROP. RIGHT-OF-WAY
---	PROP. LOT LINES
---	PROP. BUFFER



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**LEGEND**

- Unsignalized Intersection
- 🚦 Signalized Intersection
- ➔ Existing Lane
- x' Storage (In Feet)
- 🚫 (with XX) Posted Speed Limit
- ⬛ Left-Over Intersection

## **2. 2022 EXISTING PEAK HOUR CONDITIONS**

### **2.1. 2022 Existing Peak Hour Traffic Volumes**

Existing peak hour traffic volumes were determined based on traffic counts conducted at the study intersections listed below, in September of 2022 and January 2023 during typical weekday AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods, which schools were in session:

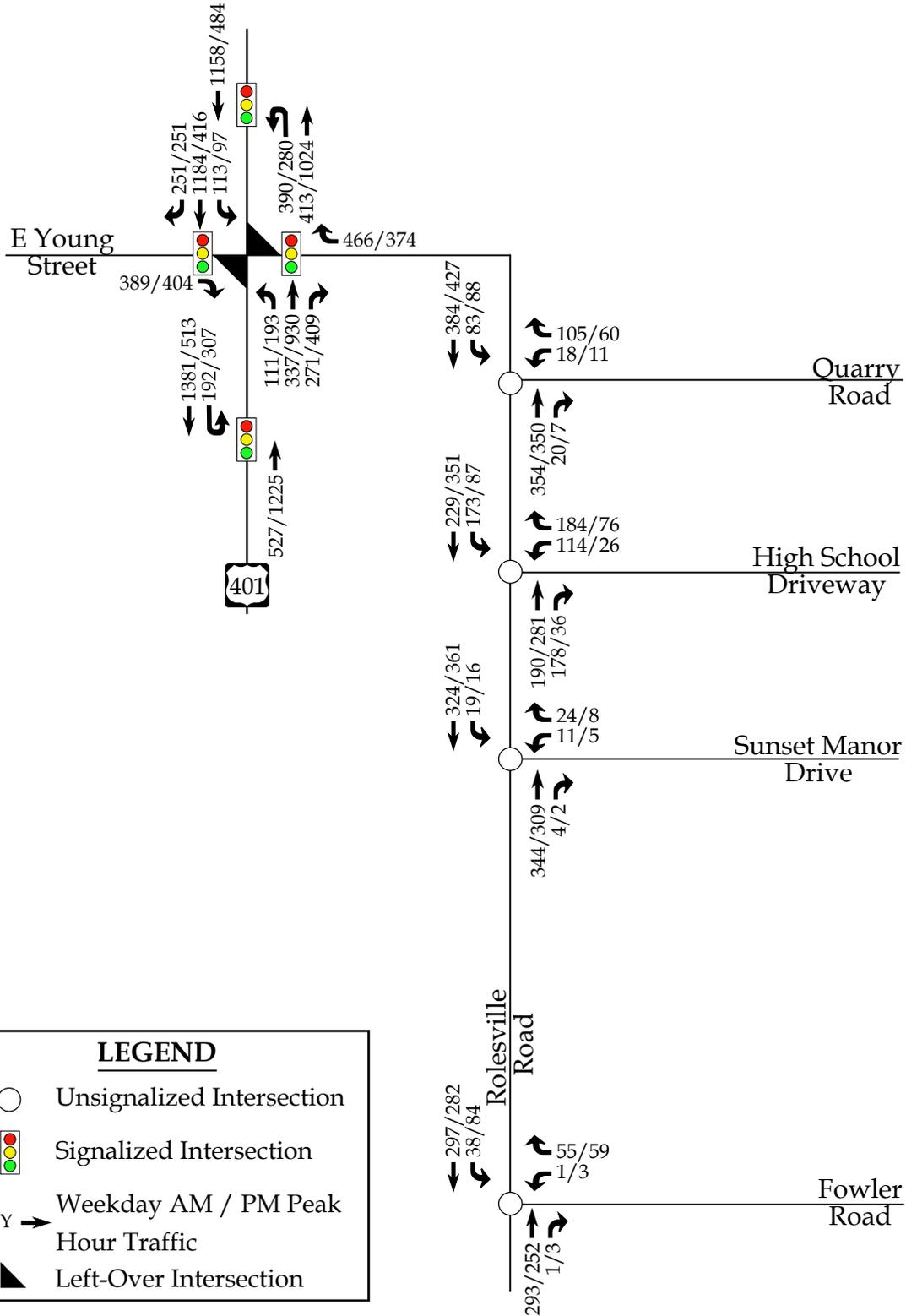
- US 401 and E Young Street
- US 401 and U-Turn North of E Young Street
- US 401 and U-Turn South of E Young Street
- E Young Street and Quarry Road
- E Young Street and Rolesville High School Driveway
- Rolesville Road and Sunset Manor Drive
- Rolesville Road and Fowler Road

Existing traffic volumes were balanced between study intersections, where appropriate. Refer to Figure 4 for 2022 existing weekday AM and PM peak hour traffic volumes. A copy of the count data is located in Appendix B of this report.

### **2.2. Analysis of 2022 Existing Peak Hour Traffic Conditions**

The 2022 existing weekday AM and PM peak hour traffic volumes were analyzed to determine the current levels of service at the study intersections under existing roadway conditions.

Signal information was obtained from NCDOT is included in Appendix C. The results of the analysis are presented in Section 7 of this report.



**LEGEND**

- Unsignalized Intersection
- 🚦 Signalized Intersection
- X / Y → Weekday AM / PM Peak Hour Traffic
- ▲ Left-Over Intersection



1216 Rolesville Road  
Rolesville, NC

2022 Existing Peak Hour Traffic	
Scale: Not to Scale	Figure 4

Note: Based on NCDOT Congestion Management guidelines, a volume of 4 vehicles per hour (vph) was analyzed for any movement with less than 4 vph.

### 3. 2028 NO-BUILD PEAK HOUR CONDITIONS

In order to account for growth of traffic and subsequent traffic conditions at a future year traffic projections are needed. Projected traffic is the component of traffic due to the growth of the community and surrounding area that is anticipated to occur regardless of whether the proposed development is constructed. No-build traffic is comprised of existing traffic growth within the study area and additional traffic created as a result of nearby approved developments.

#### 3.1. Ambient Traffic Growth

Through coordination with the Town and NCDOT, it was determined that an annual growth rate of 2% would be used to generate 2028 projected weekday AM and PM peak hour traffic volumes. Refer to Figure 5 for the 2028 projected weekday AM and PM peak hour traffic volumes.

#### 3.2. Approved Development Traffic

Based on coordination with the NCDOT and the Town, it was determined the following approved developments are expected to build out prior to 2028 and should be included in the determination of future traffic volumes:

- The Point – 96 single family detached homes north of US 401 and 525 single-family detached homes, 320 multi-family units, and 122,800 sq. ft. of retail development south of US 401. Trips for this development were taken from the 2019 TIA prepared for the development.
- Kalas Falls – 215 single-family homes on the west side of Rolesville Road between Mitchell Mill Road and Fowler Road. Trips for this development were taken from the 2019 TIA prepared for Kalas Falls.
- Preserve at Moody Falls – 82 single-family detached homes on the west side of Rolesville Road south of existing intersection of Rolesville Road and Amazon Trail. Since a TIA was not required for this development, trips for the 82 homes were generated and assigned to the roadway network according to the same distribution as Kalas Falls trips.

- Rolesville Crossing (Wheeler Tract) - 233 single-family detached homes and 125 multi-family townhomes in the northeast quadrant of the intersection of Rolesville Road and Mitchell Mill Road. Trips for this development were taken from the 2019 TIA prepared for the development.
- Tucker Wilkins - 27 single-family detached homes and 64 multi-family units on the west side of Rolesville Road north of Mitchell Mill Road. Since a TIA was not required for this development, trips for the 91 residential units were generated and assigned to the roadway network according to the same distribution as Kalas Falls trips.

Approved development information is provided in Appendix D. Refer to Figure 6 for the total weekday AM and PM peak hour approved development trips.

### 3.3. Future Roadway Improvements

The following improvements are anticipated to be made by The Point and are considered in the analysis of future conditions:

#### US 401

- Coordinate the traffic signals at the intersections of US 401 at E Young Street and the superstreet u-turn locations to the north and south.

#### US 401 and E Young Street

- Extend the storage of the existing northbound right turn lane on US 401 to provide 400 feet of storage.

#### E Young Street and Quarry Road/North Point Site Driveway

- Construct a northbound left turn lane on E Young Street with 100 feet of storage.
- Construct a southbound right turn lane on E Young Street with 100 feet of storage.
- Construct a northbound right turn lane on E Young Street with 100 feet of storage.
- Restripe the existing westbound left turn lane on Quarry Road to a shared left-through lane.
- Provide an exclusive left turn lane with 275 feet of storage and a shared through-right lane on the North Point Site Driveway.
- Install a traffic signal when warranted.

#### E Young Street and Rolesville High School Driveway/South North Point Site Driveway

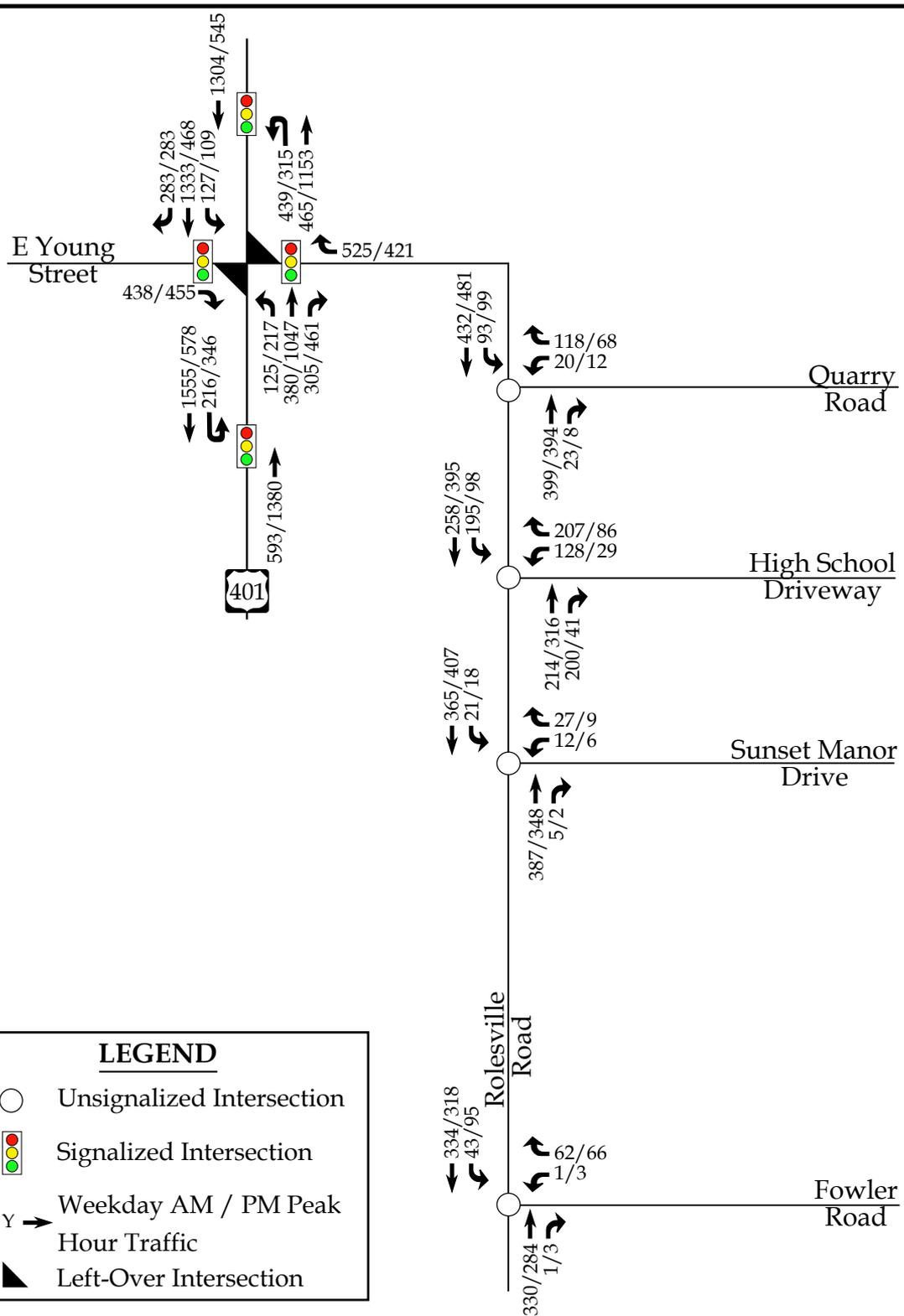
- Construct a northbound left turn lane on E Young Street with 50 feet of storage.
- Provide one egress lane on the South Site Driveway.

### **3.4. 2028 No-Build Peak Hour Traffic Volumes**

The 2028 no-build traffic volumes were determined by adding the total adjacent development trips (Figure 6) to the 2028 projected traffic volumes (Figure 5). Refer to Figure 7 for an illustration of the 2028 no-build peak hour traffic volumes at the study intersections.

### **3.5. Analysis of 2028 No-Build Peak Hour Traffic Conditions**

The 2028 no-build AM and PM peak hour traffic volumes were analyzed with the same roadway conditions and traffic control as under existing conditions. Approved development improvements noted in Section 3.3 of this report were included in the analysis. Capacity analysis results are presented in Section 7 of this report.



**LEGEND**

- Unsignalized Intersection
- 🚦 Signalized Intersection
- X / Y → Weekday AM / PM Peak Hour Traffic
- ▲ Left-Over Intersection

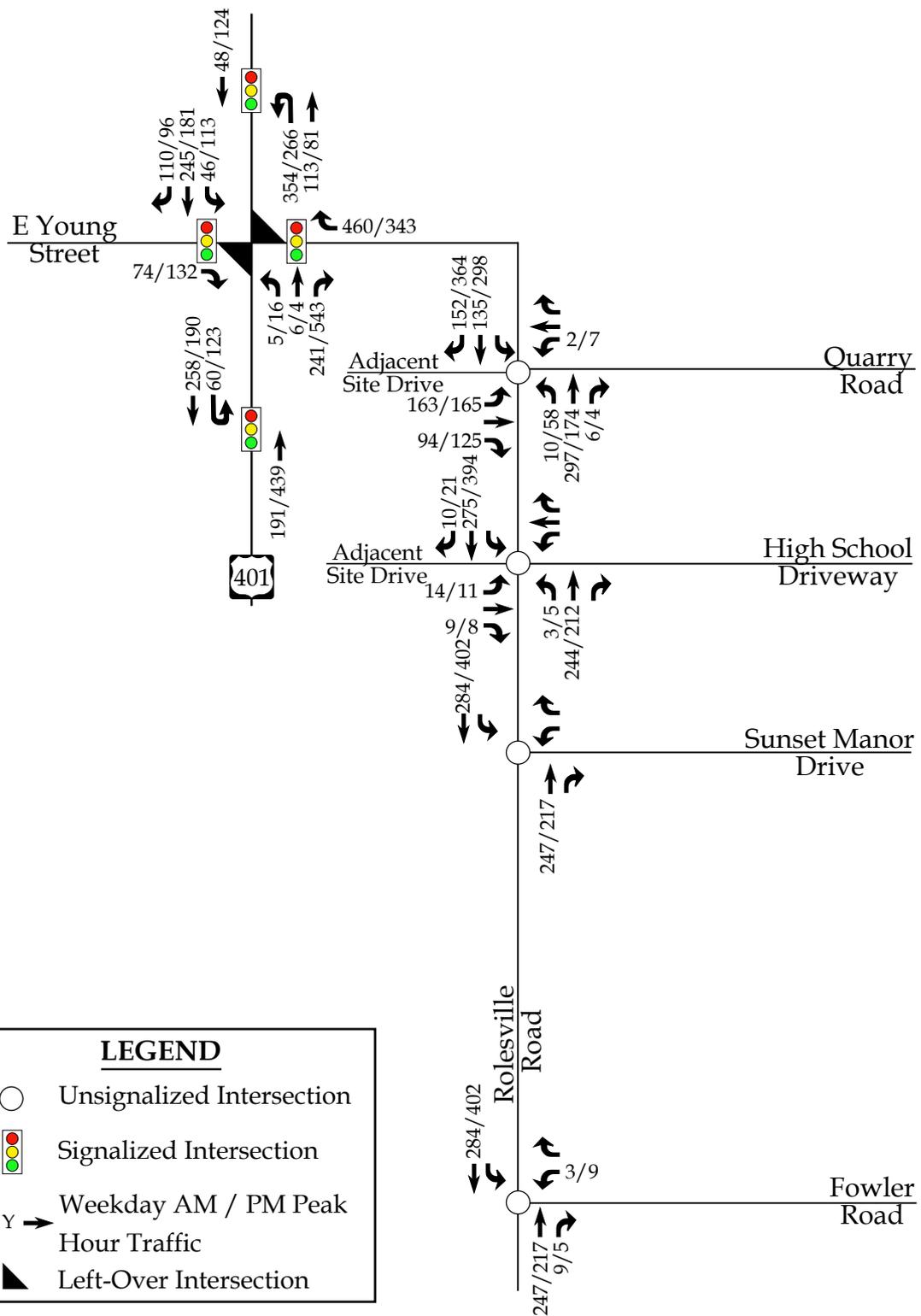


1216 Rolesville Road  
Rolesville, NC

2028 Projected  
Peak Hour Traffic

Scale: Not to Scale      Figure 5

Note: Based on NCDOT Congestion Management guidelines, a volume of 4 vehicles per hour (vph) was analyzed for any movement with less than 4 vph.



**LEGEND**

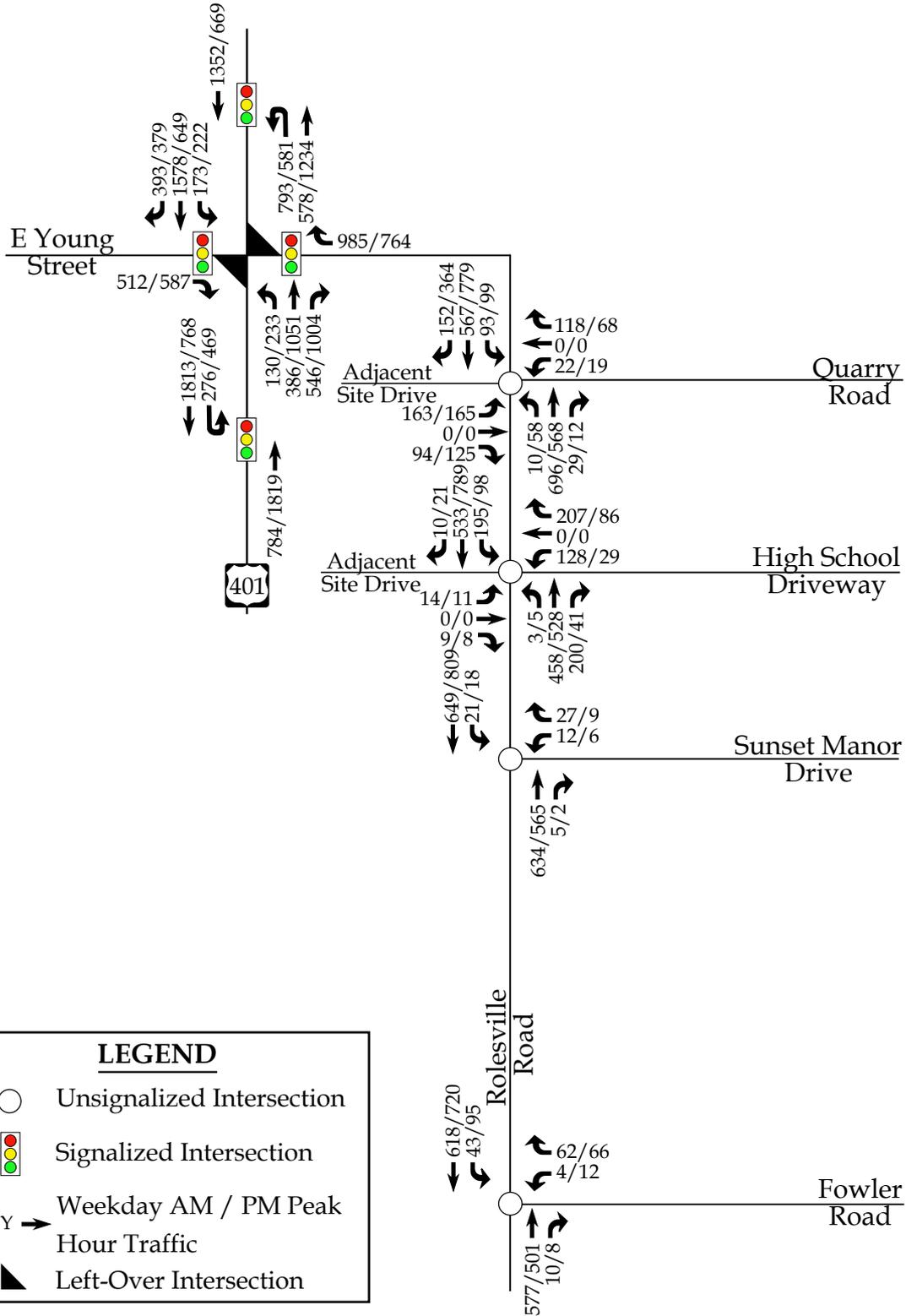
- Unsignalized Intersection
- 🚦 Signalized Intersection
- X / Y → Weekday AM / PM Peak Hour Traffic
- ▲ Left-Over Intersection



1216 Rolesville Road  
Rolesville, NC

Adjacent Development Trips

Scale: Not to Scale      Figure 6



**LEGEND**

- Unsignalized Intersection
- 🚦 Signalized Intersection
- X / Y → Weekday AM / PM Peak Hour Traffic
- ▲ Left-Over Intersection



1216 Rolesville Road  
Rolesville, NC

2028 No-Build  
Peak Hour Traffic

Scale: Not to Scale      Figure 7

Note: Based on NCDOT Congestion Management guidelines, a volume of 4 vehicles per hour (vph) was analyzed for any movement with less than 4 vph.

**4. SITE TRIP GENERATION AND DISTRIBUTION**

**4.1. Trip Generation**

The proposed development is expected to consist of 68 townhomes and 30,000 sf of retail space. Average weekday daily, AM peak hour, and PM peak hour trips for the proposed development were estimated using methodology contained within the ITE *Trip Generation Manual*, 11th Edition. Table 2 provides a summary of the trip generation potential for the site.

**Table 2: Trip Generation Summary**

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)			Weekday PM Peak Hour Trips (vph)		
			Enter	Exit	Total	Enter	Exit	Total
Single-Family Attached Housing (215)	68 DU	468	7	23	30	22	15	37
Retail (<40 KSF) (822)	30 KSF	1,496	36	23	59	85	85	170
<b>Total Trips</b>		<b>1,964</b>	<b>43</b>	<b>46</b>	<b>89</b>	<b>107</b>	<b>100</b>	<b>207</b>
<i>Internal Capture (15% PM)*</i>			-	-	-	-15	-15	-30
<b>Total External Trips</b>			<b>43</b>	<b>46</b>	<b>89</b>	<b>92</b>	<b>85</b>	<b>177</b>
<i>Pass-By Trips: Shopping Center (34% PM)</i>			-	-	-	-26	-26	-52
<b>Total Primary Trips</b>			<b>43</b>	<b>46</b>	<b>89</b>	<b>66</b>	<b>59</b>	<b>125</b>

\*Utilizing methodology contained in the NCHRP Report 684.

It is estimated that the proposed development will generate 1,964 total site trips during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 89 trips (43 entering and 46 exiting) will occur during the weekday AM peak hour and 207 trips (107 entering and 100 exiting) will occur during the weekday PM peak hour.

Internal capture of trips between the retail and residential land uses was considered in this study. Internal capture is the consideration for trips that will be made within the site between different land uses, so the vehicle technically never leaves the internal site but can still be considered as a trip to that specific land use. Based on NCHRP Report 684 methodology, a weekday PM peak hour internal capture rate of 15% was applied to the trips generated from the development. The internal capture reductions are expected to account for approximately

30 trips (15 entering and 15 exiting) during the weekday PM peak hour. NCHRP internal capture reports are provided in Appendix C.

Pass-by trips were also taken into consideration. Pass-by trips are expected to account for approximately 52 trips (26 entering and 26 exiting) during the weekday PM peak hour. It should be noted that the pass-by trips were balanced, as it is likely that these trips would enter and exit in the same hour.

The total primary trips are the calculated site trips after the reduction for internal capture and pass-by trips. Primary site trips are expected to account for approximately 89 trips (43 entering and 46 exiting) during the weekday AM peak hour and 125 trips (66 entering and 59 exiting) during the weekday PM peak hour.

#### **4.2. Site Trip Distribution and Assignment**

Site trips are distributed based on existing traffic patterns, location of population centers adjacent to the study area, and engineering judgment. A summary of the overall distributions is below.

##### Residential

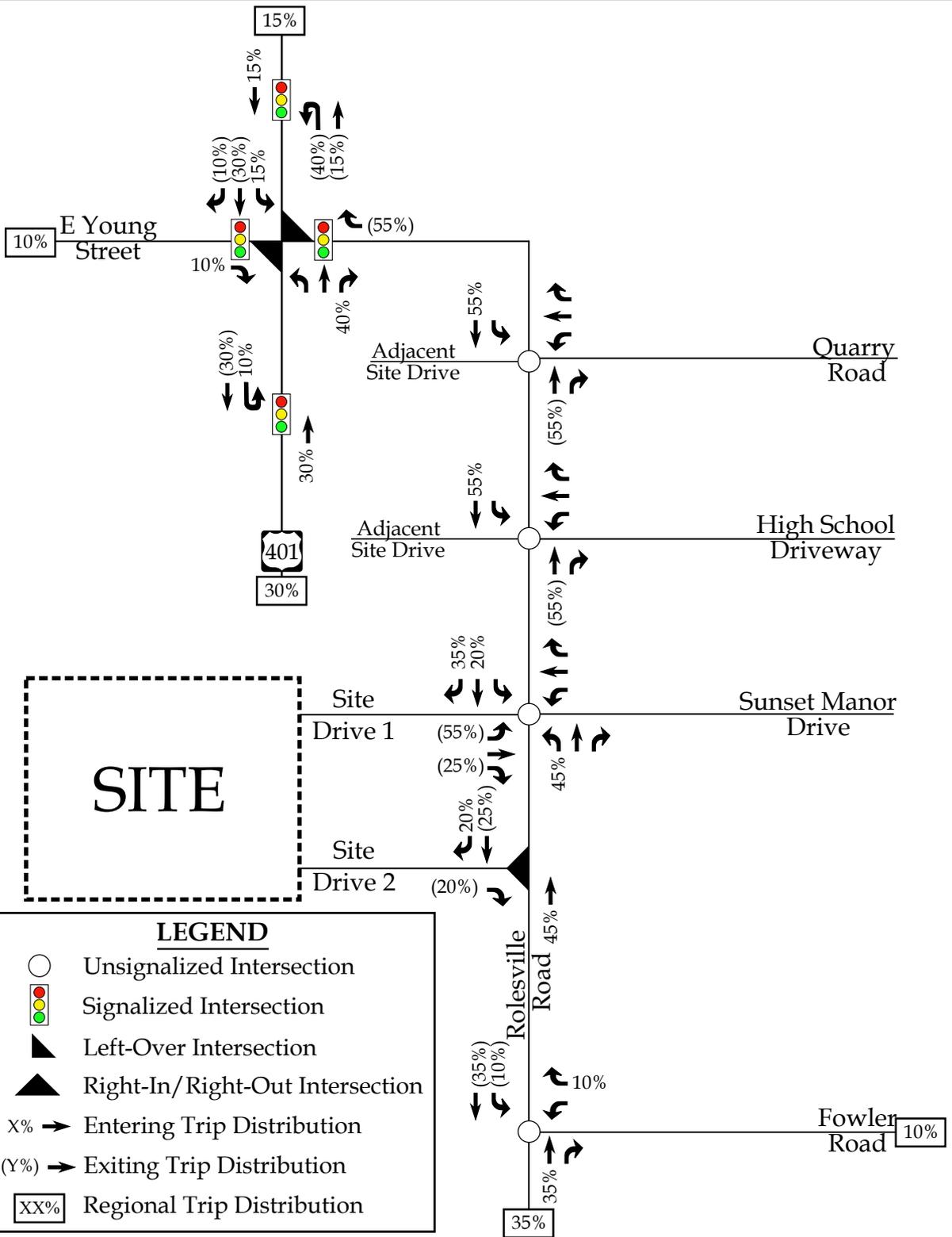
- 35% to/from the south via Rolesville Road
- 30% to/from the west via US 401 Bypass
- 15% to/from the east via US 401 Bypass
- 10% to/from the east via Fowler Road
- 10% to/from the north via E Young Street

##### Retail

- 25% to/from the south via Rolesville Road
- 20% to/from the east via US 401 Bypass
- 20% to/from the north via E Young Street
- 15% to/from the west via US 401 Bypass
- 10% to/from the east via Fowler Road
- 10% to/from the east via Quarry Road

Refer to Figure 8a for the residential site trip distribution, Figure 8b for the primary retail trip distribution, and Figure 8c for the pass-by retail trip distribution. Residential site trip

assignment is shown in Figure 9a, primary retail site trip assignment is shown in Figure 9b, and pass-by retail trip assignment is shown in Figure 9c. Total weekday AM and PM peak hour site trips are shown in Figure 10.



**LEGEND**

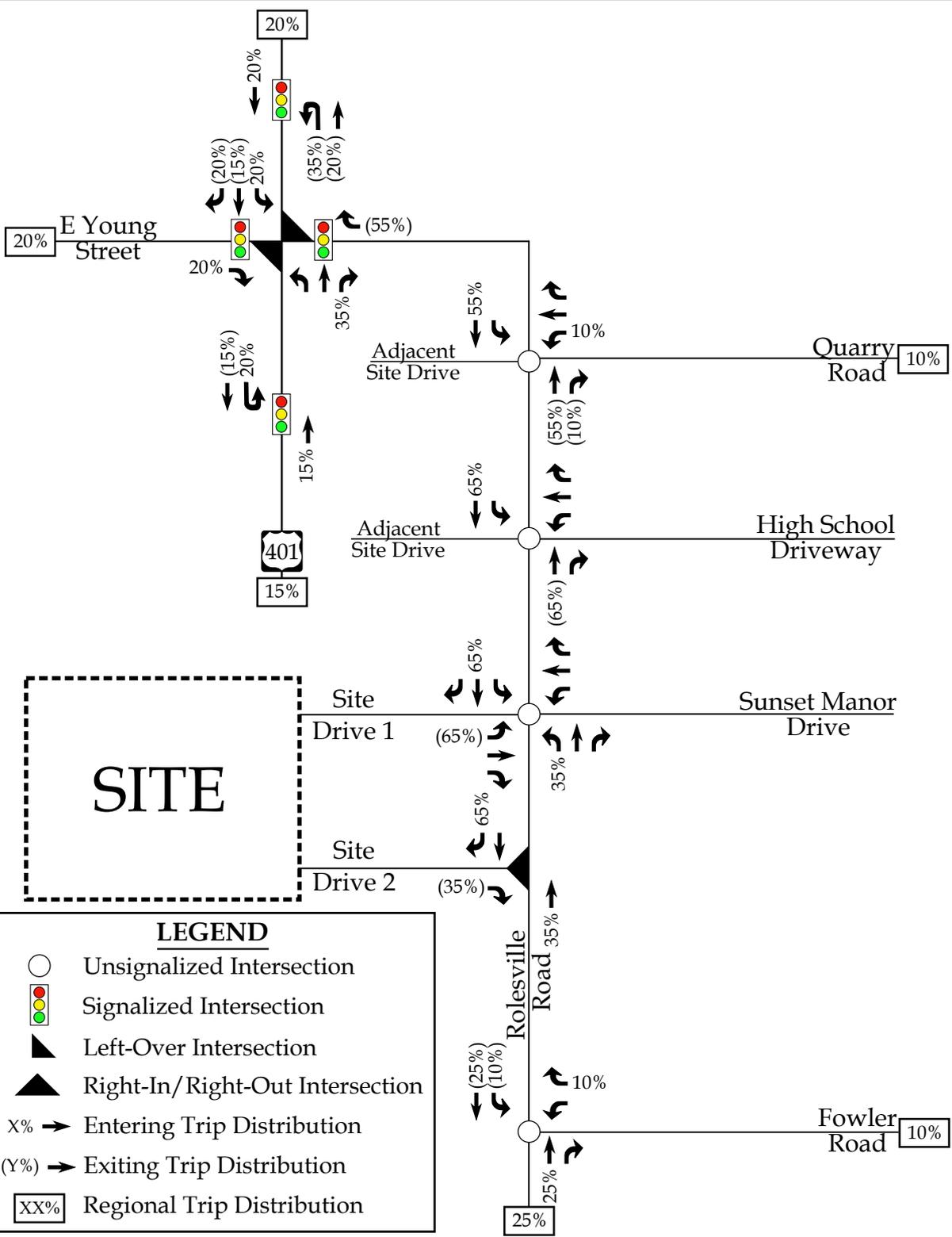
- Unsignalized Intersection
- Signalized Intersection
- Left-Over Intersection
- Right-In/Right-Out Intersection
- X% → Entering Trip Distribution
- (Y%) → Exiting Trip Distribution
- XX% Regional Trip Distribution



1216 Rolesville Road  
Rolesville, NC

Residential Site  
Trip Distribution

Scale: Not to Scale Figure 8a

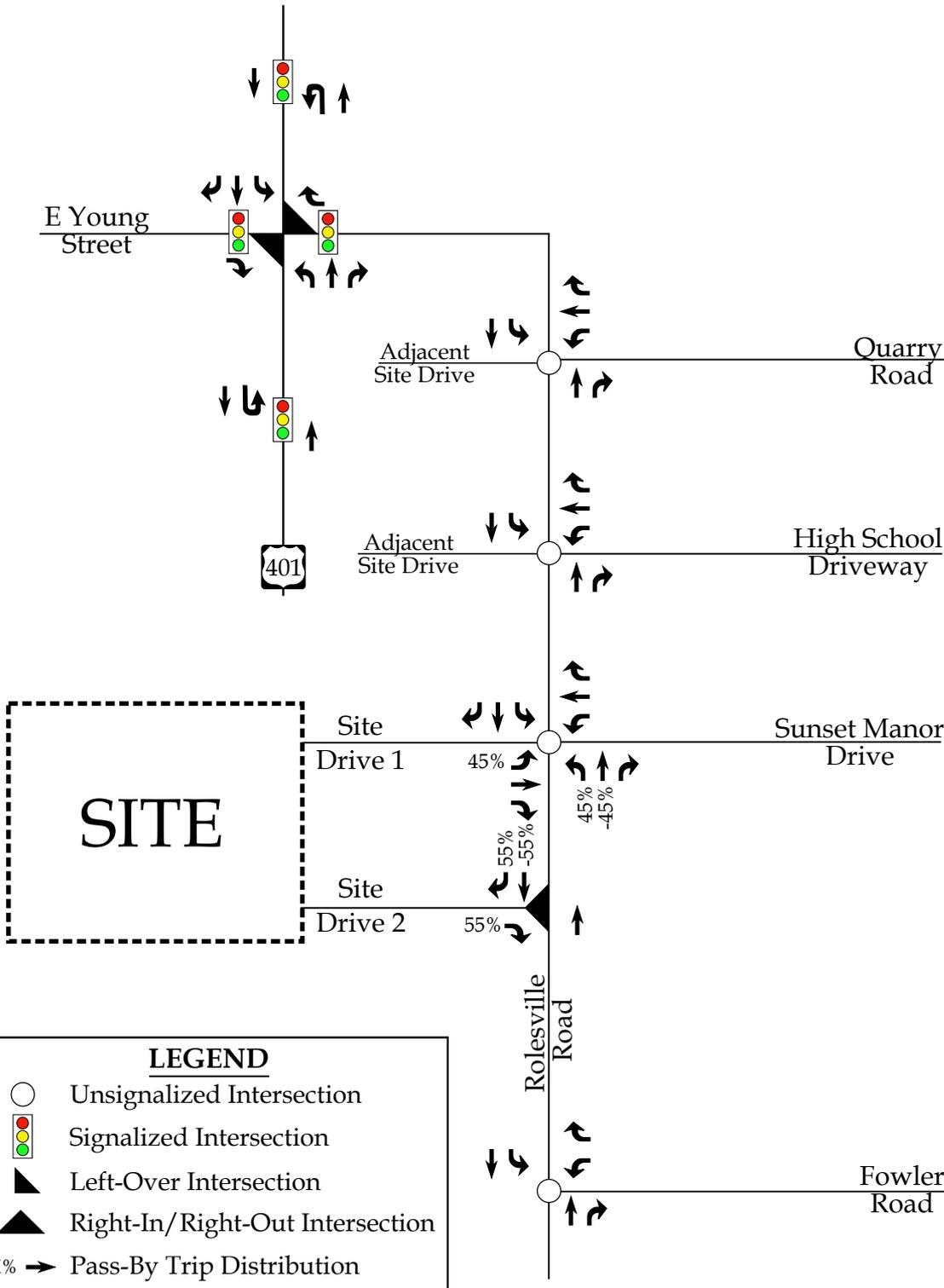


1216 Rolesville Road  
Rolesville, NC

Retail Site  
Trip Distribution

Scale: Not to Scale

Figure 8b



**LEGEND**

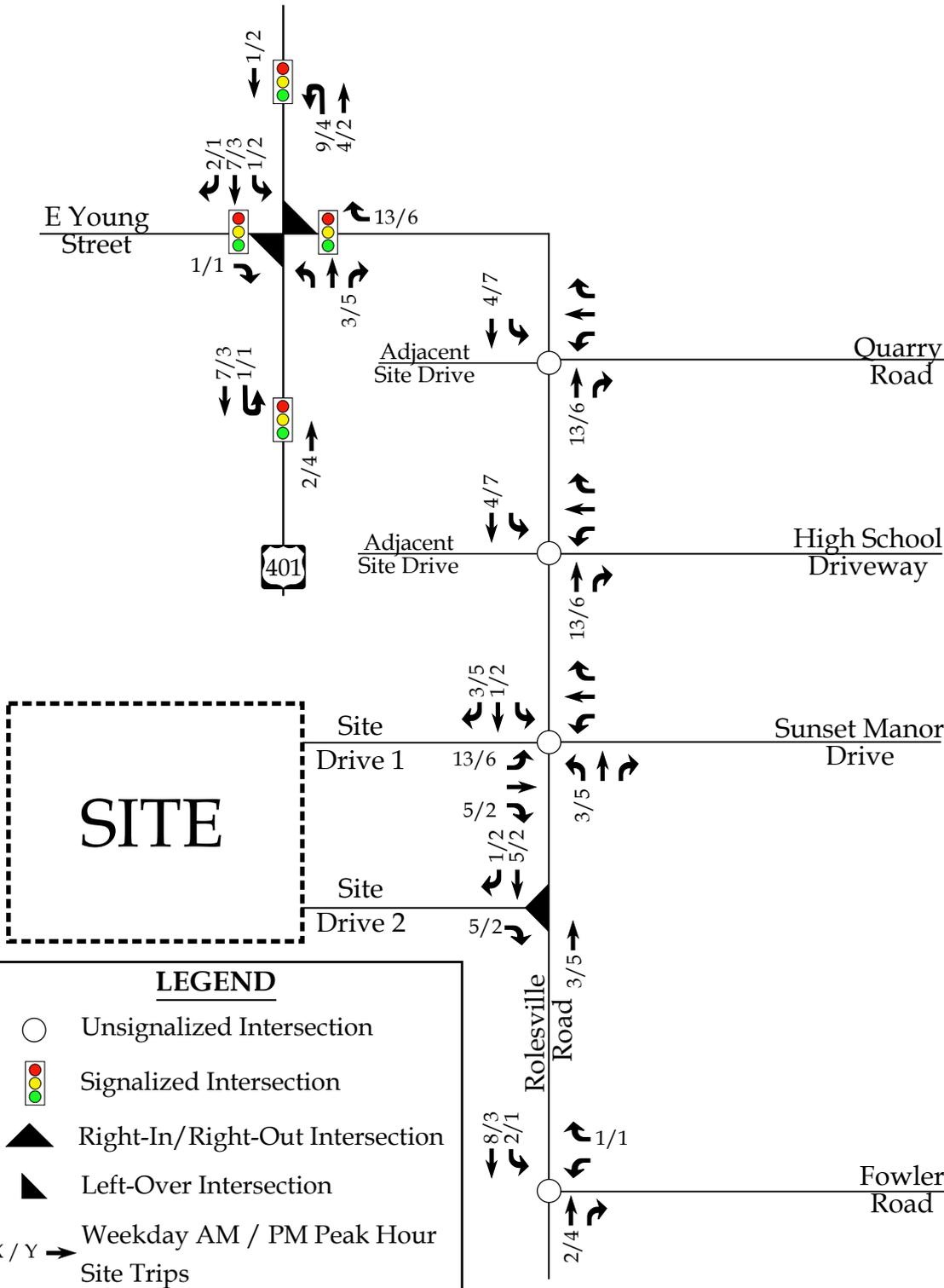
- Unsignalized Intersection
- ◫ Signalized Intersection
- ◼ Left-Over Intersection
- ◼ Right-In/Right-Out Intersection
- X% → Pass-By Trip Distribution



1216 Rolesville Road  
Rolesville, NC

Pass-By Site  
Trip Distribution

Scale: Not to Scale    Figure 8c



**LEGEND**

- Unsignalized Intersection
- 🚦 Signalized Intersection
- ▲ Right-In/Right-Out Intersection
- ▼ Left-Over Intersection
- X / Y → Weekday AM / PM Peak Hour Site Trips

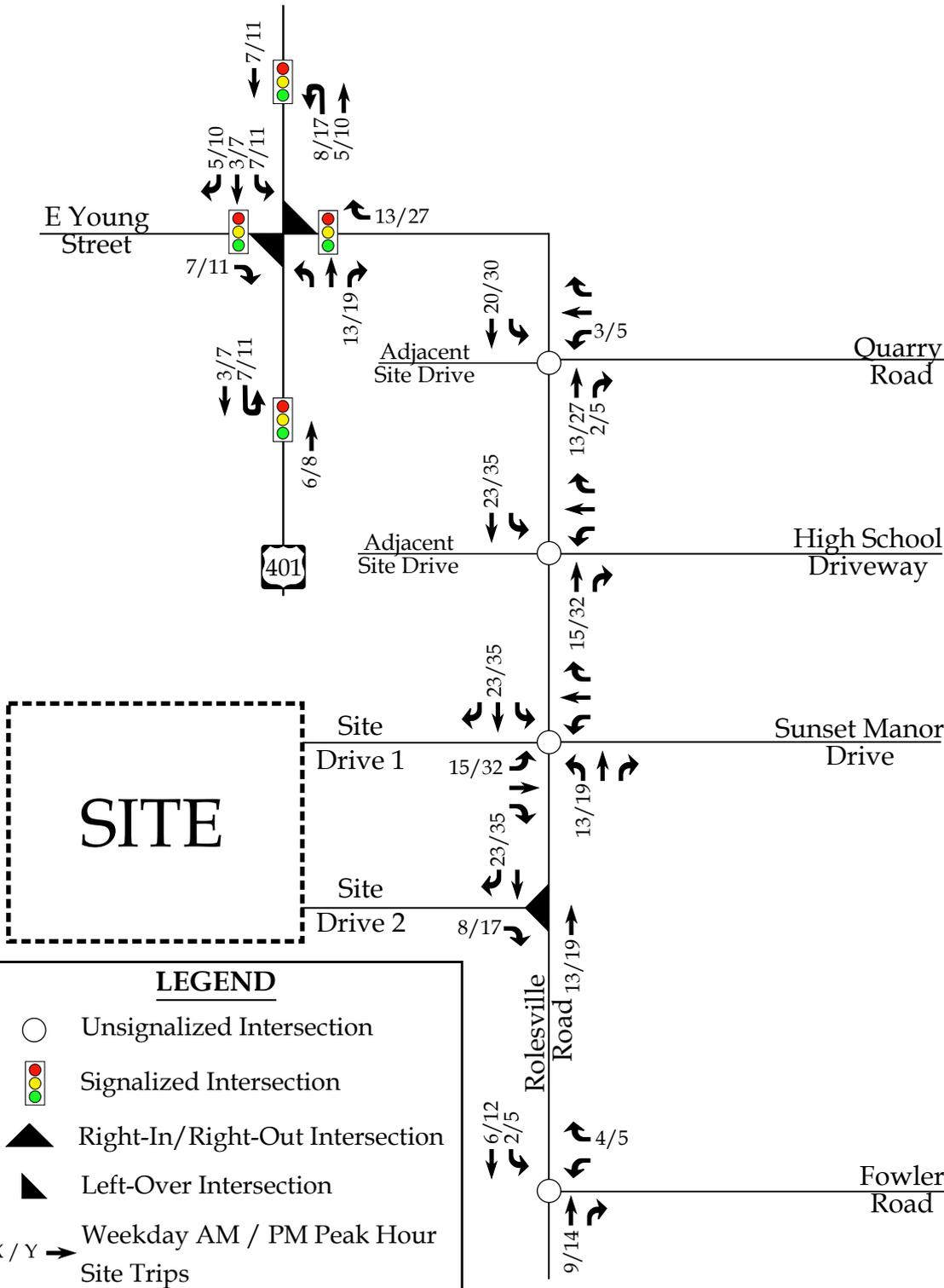


1216 Rolesville Road  
Rolesville, NC

Residential Site  
Trip Assignment

Scale: Not to Scale

Figure 9a



**LEGEND**

- Unsignalized Intersection
- 🚦 Signalized Intersection
- ▲ Right-In/Right-Out Intersection
- ◼ Left-Over Intersection
- X / Y → Weekday AM / PM Peak Hour Site Trips

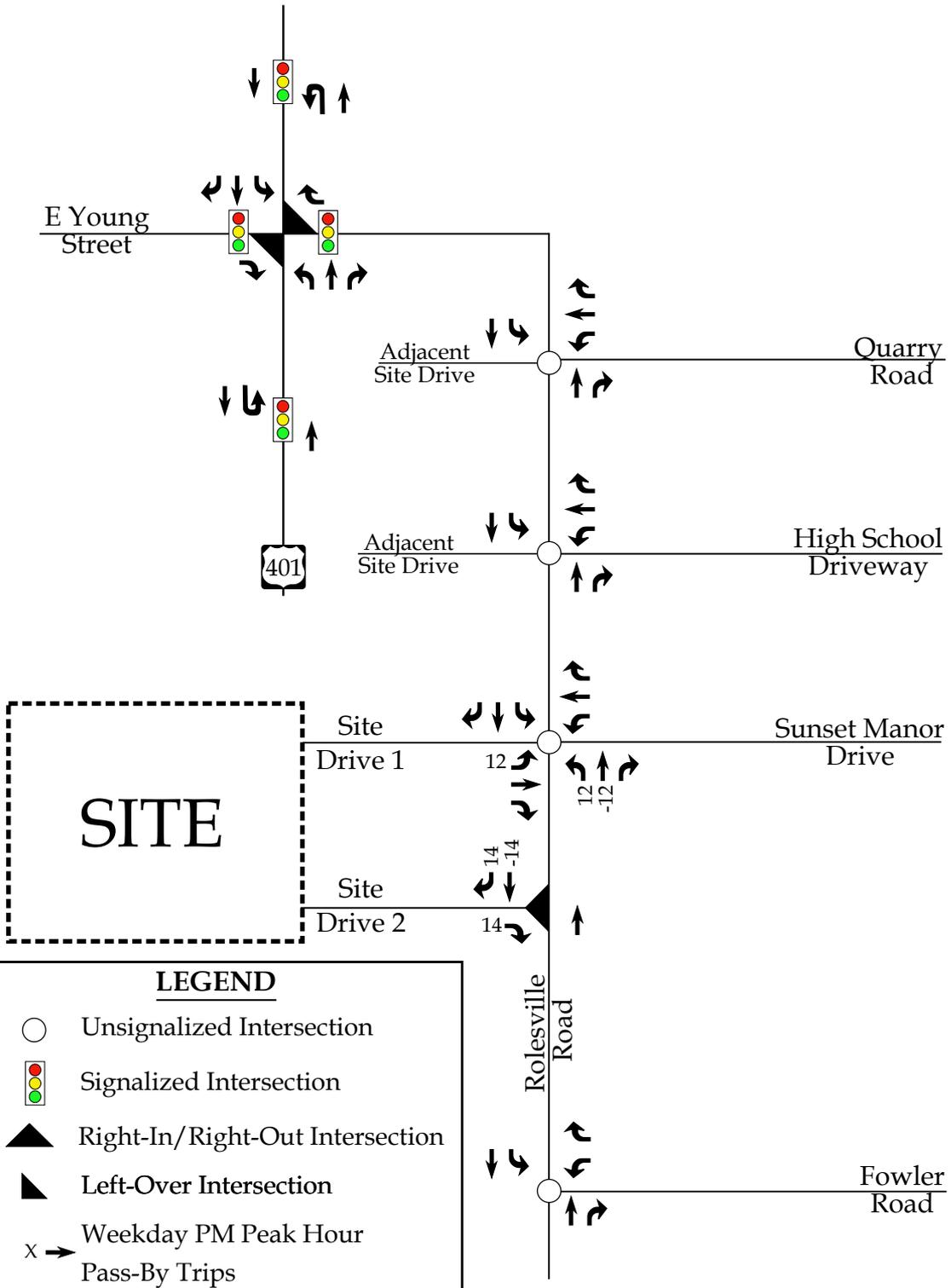


1216 Rolesville Road  
Rolesville, NC

Retail Site  
Trip Assignment

Scale: Not to Scale

Figure 9b



**LEGEND**

- Unsignalized Intersection
- 🚦 Signalized Intersection
- ▲ Right-In/Right-Out Intersection
- ▼ Left-Over Intersection
- x → Weekday PM Peak Hour Pass-By Trips

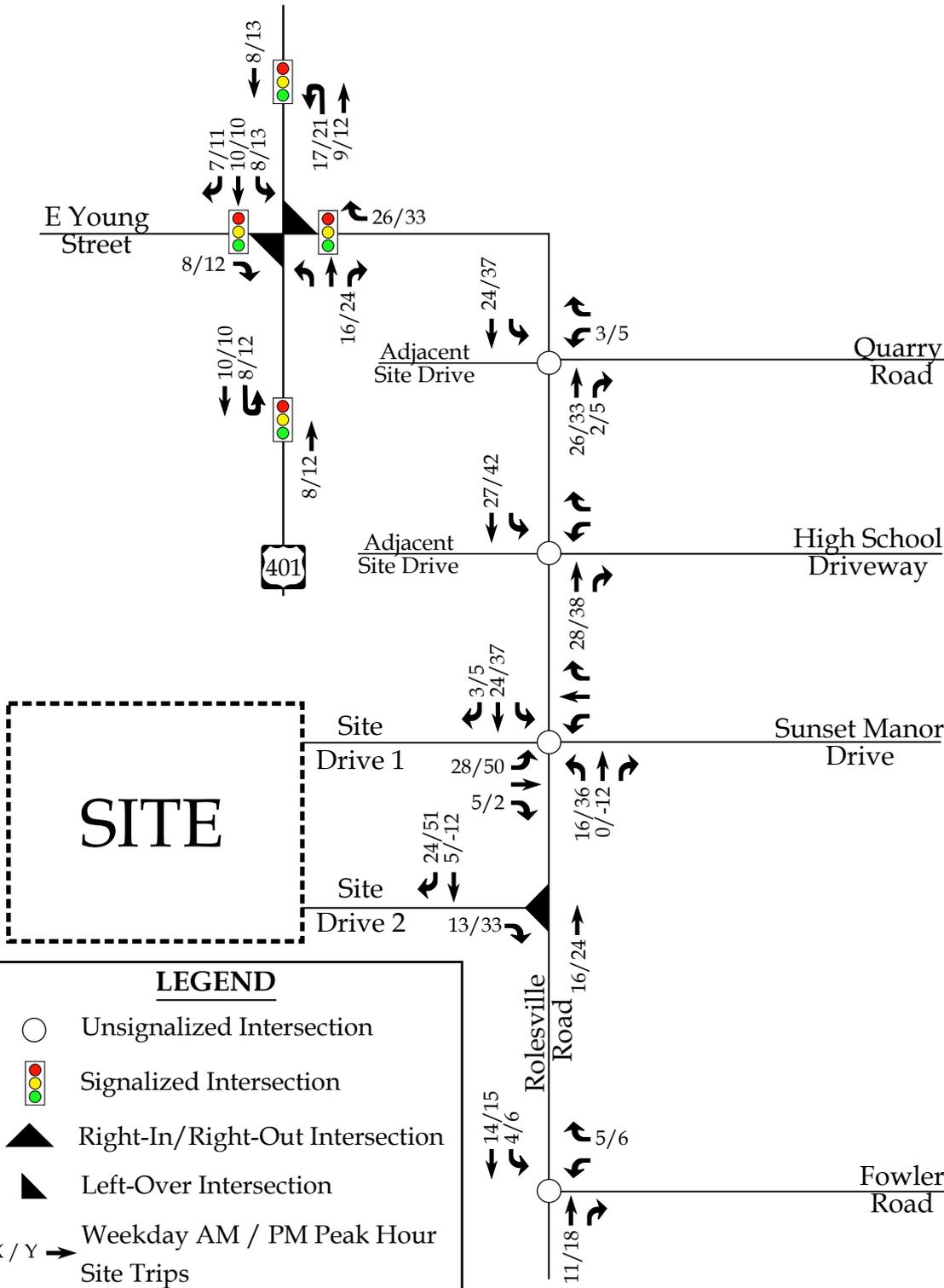


1216 Rolesville Road  
Rolesville, NC

Pass-By Site  
Trip Assignment

Scale: Not to Scale

Figure 9c



**LEGEND**

-  Unsignalized Intersection
-  Signalized Intersection
-  Right-In/Right-Out Intersection
-  Left-Over Intersection
- X / Y → Weekday AM / PM Peak Hour Site Trips



1216 Rolesville Road  
Rolesville, NC

Total Site Trip  
Assignment

Scale: Not to Scale

Figure 10

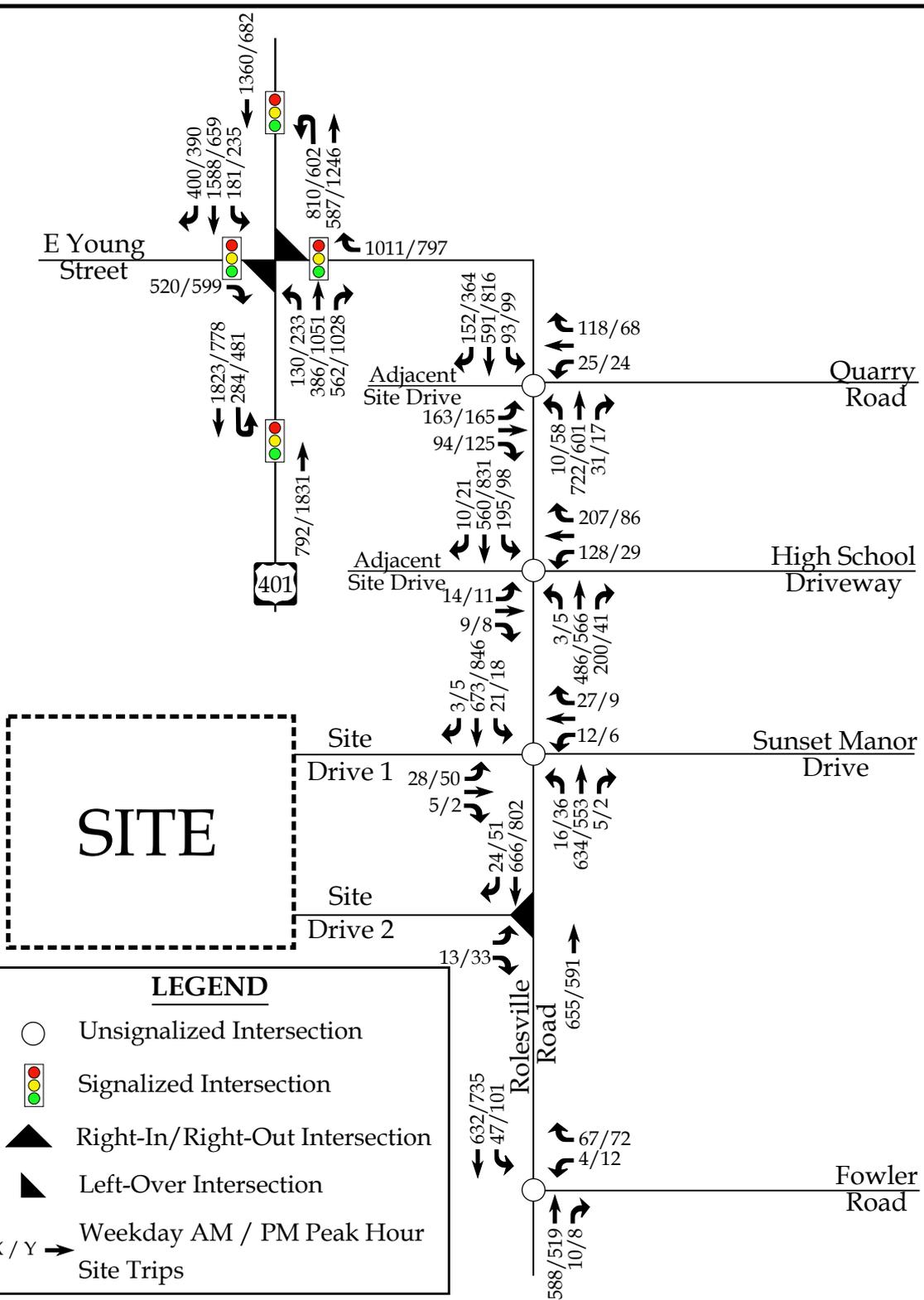
## **5. 2028 BUILD TRAFFIC CONDITIONS**

### **5.1. 2028 Build Peak Hour Traffic Volumes**

To estimate traffic conditions with the site fully built out, the total site trips (Figure 10) were added to the 2028 no-build traffic volumes (Figure 7) to determine the 2028 build traffic volumes. Refer to Figure 11 for the 2028 build peak hour traffic volumes with the proposed site fully developed.

### **5.2. Analysis of 2028 Build Peak Hour Traffic Conditions**

Study intersections were analyzed with the 2028 build traffic volumes using the same methodology previously discussed for existing and no-build traffic conditions. If necessary, intersections were analyzed with improvements to accommodate future site traffic volumes. The results of the capacity analysis for each intersection are presented in Section 7 of this report.



1216 Rolesville Road  
Rolesville, NC

2028 Build  
Peak Hour Traffic

Scale: Not to Scale

Figure 11

Note: Based on NCDOT Congestion Management guidelines, a volume of 4 vehicles per hour (vph) was analyzed for any movement with less than 4 vph.

**6. TRAFFIC ANALYSIS PROCEDURE**

Study intersections were analyzed using the methodology outlined in the *Highway Capacity Manual* (HCM), 6<sup>th</sup> Edition published by the Transportation Research Board. Capacity and level of service are the design criteria for this traffic study. A computer software package, Synchro (Version 11), was used to complete the analyses for the study area intersections. Please note that the unsignalized capacity analysis does not provide an overall level of service for an intersection; only delay for an approach with a conflicting movement.

The HCM defines capacity as “the maximum hourly rate at which persons or vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under prevailing roadway, traffic, and control conditions.” Level of service (LOS) is a term used to represent different driving conditions and is defined as a “qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers.” Level of service varies from Level “A” representing free flow, to Level “F” where breakdown conditions are evident. Refer to Table 3 for HCM levels of service and related average control delay per vehicle for both signalized and unsignalized intersections. Control delay as defined by the HCM includes “initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay”. An average control delay of 50 seconds at a signalized intersection results in LOS “D” operation at the intersection.

**Table 3: Highway Capacity Manual – Levels-of-Service and Delay**

UNSIGNALIZED INTERSECTION		SIGNALIZED INTERSECTION	
LEVEL OF SERVICE	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)	LEVEL OF SERVICE	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)
A	0-10	A	0-10
B	10-15	B	10-20
C	15-25	C	20-35
D	25-35	D	35-55
E	35-50	E	55-80
F	>50	F	>80

**6.1. Adjustments to Analysis Guidelines**

Capacity analysis at all study intersections was completed according to the NCDOT Congestion Management Guidelines, with the exception of analysis permitting right turns on red. This adjustment was made to be consistent with the TIA that was prepared for The Point.

**7. CAPACITY ANALYSIS**

**7.1. US 401 and E Young Street**

The existing signalized intersection of US 401 and E Young Street was analyzed under 2022 existing, 2028 no-build, and 2028 build traffic conditions with lane configurations shown in Table 4. Refer to Table 4 for a summary of the analysis results. Refer to Appendix E for the Synchro capacity analysis reports and to Appendix M for the SimTraffic queuing reports.

**Table 4: Analysis Summary of US 401 and E Young Street**

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2022 Existing (NB 401)	WB	2 RT	A	A (2)	A	A (6)
	NB	2 TH, 1 RT	A		A	
	SB	1 LT	A		A	
2022 Existing (SB 401)	EB	2 RT	B	A (9)	A	A (3)
	NB	1 LT	A		A	
	SB	2 TH, 1 RT	A		A	
2028 No-Build (NB 401)	WB	2 RT	A	B (11)	A	B (13)
	NB	2 TH, 1 RT	C		C	
	SB	1 LT	A		A	
2028 No-Build (SB 401)	EB	2 RT	D	B (14)	B	A (8)
	NB	1 LT	A		A	
	SB	2 TH, 1 RT	A		A	
2028 Build (NB 401)	WB	2 RT	A	B (12)	A	B (13)
	NB	2 TH, 1 RT	C		C	
	SB	1 LT	A		A	
2028 Build (SB 401)	EB	2 RT	D	B (14)	B	A (8)
	NB	1 LT	A		A	
	SB	2 TH, 1 RT	A		A	

Capacity analysis indicates the existing signalized intersections of US 401 NB at E Young Street and US 401 SB at E Young Street currently operate a LOS A during both the AM and PM peak hours.

Future year conditions were analyzed with the following approved development improvements:

- Coordinate the traffic signals at the intersection of US 401 at E Young Street and the superstreet u-turn locations. (The Point)
- Extend the storage of the existing northbound right turn lane on US 401 to provide 400 feet of storage. (The Point)

Capacity analysis indicates that the intersections are anticipated to operate at LOS B or better under no-build and build conditions.

**7.2. US 401 SB and U-Turn North of E Young Street**

The existing signalized intersection of US 401 and the u-turn location north of E Young Street was analyzed under 2022 existing, 2028 no-build, and 2028 build traffic conditions with lane configurations shown in Table 5. Refer to Table 5 for a summary of the analysis results. Refer to Appendix F for the Synchro capacity analysis reports and to Appendix M for the SimTraffic queuing reports.

**Table 5: Analysis Summary of US 401 SB and U-Turn North of E Young Street**

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2022 Existing	NB SB	1 UT* 2 TH	A A	A (5)	A A	A (4)
2028 No-Build	NB SB	1 UT* 2 TH	A B	B (11)	A A	A (3)
2028 Build	NB SB	1 UT* 2 TH	A B	B (12)	A A	A (3)

\*The northbound u-turn movement is analyzed as a westbound left turn movement in Synchro.

Capacity analysis indicates the existing signalized intersection of US 401 SB and the u-turn north of E Young Street currently operate a LOS A during both the AM and PM peak hours.

Future year conditions were analyzed with the following approved development improvements:

- Coordinate the traffic signals at the intersection of US 401 at E Young Street and the superstreet u-turn locations. (The Point)

Capacity analysis indicates that the intersections are anticipated to operate at LOS B or better under no-build and build conditions.

**7.3. US 401 NB and U-Turn South of E Young Street**

The existing signalized intersection of US 401 and the u-turn location south of E Young Street was analyzed under 2022 existing, 2028 no-build, and 2028 build traffic conditions with lane configurations shown in Table 6. Refer to Table 6 for a summary of the analysis results. Refer to Appendix G for the Synchro capacity analysis reports and to Appendix M for the SimTraffic queuing reports.

**Table 6: Analysis Summary of US 401 NB and U-Turn South of E Young Street**

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2022 Existing	NB SB	2 TH 1 UT*	A A	A (5)	A A	A (6)
2028 No-Build	NB SB	2 TH 1 UT*	A A	A (2)	A A	A (6)
2028 Build	NB SB	2 TH 1 UT*	A A	A (2)	A A	A (6)

\*The southbound u-turn movement is analyzed as an eastbound left turn movement in Synchro.

Capacity analysis indicates the existing signalized intersection of US 401 NB and the u-turn south of E Young Street currently operate a LOS A during both the AM and PM peak hours.

Future year conditions were analyzed with the following approved development improvements:

- Coordinate the traffic signals at the intersection of US 401 at E Young Street and the superstreet u-turn locations. (The Point)

Capacity analysis indicates that the intersections are anticipated to continue to operate at LOS A under no-build and build conditions.

### 7.4. E Young Street and Quarry Road

The intersection of E Young Street and Quarry Road was analyzed under 2022 existing, 2028 no-build, and 2028 build traffic conditions with lane configurations shown in Table 7. Refer to Table 7 for a summary of the analysis results. Refer to Appendix H for the Synchro capacity analysis reports and to Appendix M for the SimTraffic queuing reports.

**Table 7: Analysis Summary of E Young Street and Quarry Road**

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2022 Existing	WB NB SB	1 LT, 1 RT 1 TH-RT 1 LT, 1 TH	B <sup>2</sup> -- A <sup>1</sup>	N/A	B <sup>2</sup> -- A <sup>1</sup>	N/A
2028 No-Build	EB WB NB SB	1 LT, 1 TH-RT 1 LT-TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 1 TH, 1 RT	C B C B	C (23)	C B C B	B (19)
2028 Build	EB WB NB SB	1 LT, 1 TH-RT 1 LT-TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 1 TH, 1 RT	D B C B	C (23)	C B C B	C (22)

1. Level of service for major-street left-turn movement.  
 2. Level of service for minor-street approach.

Analysis indicates the westbound approach of Quarry Road currently operates at LOS B during both peak hours, while the southbound left turn movement on E Young Street operates at LOS A.

Future year conditions were analyzed with the following improvements by The Point:

- Construct a northbound left turn lane on E Young Street with 100 feet of storage.
- Construct a southbound right turn lane on E Young Street with 100 feet of storage.
- Construct a northbound right turn lane on E Young Street with 100 feet of storage.

- Restripe the existing westbound left turn lane on Quarry Road to a shared left-through lane.
- Provide an exclusive left turn lane with 275 feet of storage and a shared through-right lane on the North Point Site Driveway.
- Install a traffic signal when warranted.

Capacity analysis indicates the intersection is expected to operate at an overall LOS C during the AM peak hour and LOS B during the PM peak hour under no-build conditions. The intersection is anticipated to operate at LOS C or better under build conditions.

### 7.5. E Young Street and Rolesville High School Driveway

The existing unsignalized intersection of E Young Street and Rolesville High School Driveway was analyzed under 2022 existing, 2028 no-build, and 2028 build traffic conditions with lane configurations shown in Table 8. Refer to Table 8 for a summary of the analysis results. Refer to Appendix I for the Synchro capacity analysis reports and to Appendix M for the SimTraffic queuing reports.

**Table 8: Analysis Summary of E Young Street and Rolesville H.S. Driveway**

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2022 Existing	WB NB SB	1 LT, 1 RT 1 TH, 1 RT 1 LT, 1 TH	E <sup>2</sup> -- A <sup>1</sup>	N/A	B <sup>2</sup> -- A <sup>1</sup>	N/A
2028 No-Build	EB WB NB SB	1 LT-TH-RT 1 LT-TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 1 TH-RT	F <sup>2</sup> F <sup>2</sup> A <sup>1</sup> A <sup>1</sup>	N/A	F <sup>2</sup> E <sup>2</sup> A <sup>1</sup> A <sup>1</sup>	N/A
2028 Build	EB WB NB SB	1 LT-TH-RT 1 LT-TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 1 TH-RT	F <sup>2</sup> F <sup>2</sup> A <sup>1</sup> B <sup>1</sup>	N/A	F <sup>2</sup> F <sup>2</sup> B <sup>1</sup> A <sup>1</sup>	N/A

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Analysis indicates the westbound approach of Rolesville High School Driveway currently operates with moderate delays during the AM peak hour and short delays during the PM peak hour.

Future year conditions were analyzed with the following improvements by The Point:

- Construct a northbound left turn lane on E Young Street with 50 feet of storage.
- Construct South Site Driveway as eastbound approach and provide one egress lane.

Capacity analysis indicates the minor street approaches are anticipated to operate at LOS E or F during the AM and PM peak hours. It is typical for minor approaches intersecting major streets to experience poor levels of service during peak hours due to the volume of traffic along the mainline.

**7.6. Rolesville Road and Sunset Manor Drive/Site Drive 1**

The unsignalized intersection of Rolesville Road and Sunset Manor Drive/Site Drive 1 was analyzed under 2022 existing, 2028 no-build, and 2028 build traffic conditions with lane configurations shown in Table 9. Refer to Table 9 for a summary of the analysis results. Refer to Appendix J for the Synchro capacity analysis reports and to Appendix M for the SimTraffic queuing reports.

**Table 9: Analysis Summary of Rolesville Road and Sunset Manor Drive/Site Drive 1**

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2022 Existing	WB NB SB	1 LT-RT 1 TH-RT 1 LT, 1 TH	B <sup>2</sup> -- A <sup>1</sup>	N/A	B <sup>2</sup> -- A <sup>1</sup>	N/A
2028 No-Build	WB NB SB	1 LT-RT 1 TH-RT 1 LT, 1 TH	C <sup>2</sup> -- A <sup>1</sup>	N/A	C <sup>2</sup> -- A <sup>1</sup>	N/A
2028 Build	EB WB NB SB	<b>1 LT-TH-RT</b> 1 LT-TH-RT <b>1 LT, 1 TH-RT</b> 1 LT, 1 TH-RT	F <sup>2</sup> D <sup>2</sup> A <sup>1</sup> A <sup>1</sup>	N/A	F <sup>2</sup> E <sup>2</sup> B <sup>1</sup> A <sup>1</sup>	N/A

Recommended improvements by developer are shown in bold.

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Analysis indicates the westbound approach of Sunset Manor Drive currently operates at LOS C or better during the AM and PM peak hours and is expected to continue to do so under 2028 no-build traffic conditions.

Under 2028 build conditions, a northbound left turn lane and a southbound right turn lane were considered based on the NCDOT *Policy on Street and Driveway Access to North Carolina Highways*. Based on anticipated 2028 build traffic volumes, a northbound left turn lane with 75 feet of storage is recommended. Refer to Appendix N for the turn lane warrant charts.

Analysis indicates the minor street approaches are expected to operate at LOS D or worse during the peak hours under 2028 build conditions. However, it is typical for minor approaches intersecting major streets to experience poor levels of service during peak hours due to the volume of traffic along the mainline. Queue lengths are expected to be short (approximately four vehicles or less). It is not expected that 4-hour or 8-hour MUTCD traffic signal warrants would be met.

**7.7. Rolesville Road and Fowler Road**

The unsignalized intersection of Rolesville Road and Fowler Road was analyzed under 2022 existing, 2028 no-build, and 2028 build traffic conditions with existing lane configurations and traffic control, as shown in Table 10. Refer to Table 10 for a summary of the analysis results. Refer to Appendix K for the Synchro capacity analysis reports and to Appendix M for the SimTraffic queuing reports.

**Table 10: Analysis Summary of Rolesville Road and Fowler Road**

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2022 Existing	WB NB SB	1 LT-RT 1 LT-RT 1 LT-TH	B <sup>2</sup> -- A <sup>1</sup>	N/A	B <sup>2</sup> -- A <sup>1</sup>	N/A
2028 No-Build	WB NB SB	1 LT-RT 1 TH-RT 1 LT-TH	C <sup>2</sup> -- A <sup>1</sup>	N/A	C <sup>2</sup> -- A <sup>1</sup>	N/A
2028 Build	WB NB SB	1 LT-RT 1 TH-RT 1 LT-TH	C <sup>2</sup> -- A <sup>1</sup>	N/A	C <sup>2</sup> -- A <sup>1</sup>	N/A

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Analysis indicates the westbound approach of Fowler Road currently operates at LOS B during the AM and PM peak hour. Under 2028 no-build and 2028 build conditions, the westbound approach is anticipated to operate at LOS C during the peak hours.

**7.8. Rolesville Road and Site Drive 2**

The proposed right-in/right-out intersection of Rolesville Road and Site Drive 2 was analyzed under 2028 build traffic conditions with lane configurations and traffic control shown in Table 11. Refer to Table 11 for a summary of the analysis results. Refer to Appendix L for the Synchro capacity analysis reports and to Appendix M for the SimTraffic queuing reports.

**Table 11: Analysis Summary of Rolesville Road and Site Drive 2**

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2028 Build	EB NB SB	<b>1 RT</b> 1 TH 1 TH, <b>1 RT</b>	B <sup>1</sup> -- --	N/A	C <sup>1</sup> -- --	N/A

Developer improvements shown in bold.  
 1. Level of service for minor-street approach.

Under 2028 build conditions, a southbound right turn lane was considered based on the NCDOT *Policy on Street and Driveway Access to North Carolina Highways*. Based on anticipated 2028 build traffic volumes, a southbound right turn lane with 50 feet of storage is recommended. Refer to Appendix N for the turn lane warrant charts.

Analysis indicates the eastbound approach of Site Drive 2 is anticipated to operate with short delays during both the AM and PM peak hour.

## 8. CONCLUSIONS

This Traffic Impact Analysis was conducted to determine the potential traffic impacts of the development proposed to be located at 1216 Rolesville Road in Rolesville, North Carolina. The proposed development is anticipated to be completed in 2028 and is expected to consist of the following uses:

- 68 units Single-Family Attached Housing (LUC 215)
- 30,000 sq. ft. retail (LUC 822)

Access to the development is proposed to be provided via one full-movement driveway connection to Rolesville Road aligning with Sunset Manor Drive and one right-in/right out driveway located approximately 275 feet to the south. A stub connection to the planned The Point development is also proposed.

The study analyzes traffic conditions during the weekday AM and PM peak hours for the following scenarios:

- 2022 Existing Traffic Conditions
- 2028 (build-out year plus one) No-Build Traffic Conditions
- 2028 (build-out year plus one) Build Traffic Conditions

### Trip Generation

It is estimated that the proposed development will generate 1,964 total site trips during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 89 trips (43 entering and 46 exiting) will occur during the weekday AM peak hour and 207 trips (107 entering and 100 exiting) will occur during the weekday PM peak hour.

The total primary trips are the calculated site trips after the reduction for internal capture and pass-by trips. Primary site trips are expected to account for approximately 89 trips (43 entering and 46 exiting) during the weekday AM peak hour and 125 trips (66 entering and 59 exiting) during the weekday PM peak hour.

### Adjustments to Analysis Guidelines

Capacity analysis at all study intersections was completed according to the NCDOT Congestion Management Guidelines, with the exception of analysis permitting right turns on red. This adjustment was made to be consistent with the TIA that was prepared for The Point.

### Intersection Capacity Analysis Summary

All the study area intersections (including the proposed site driveways) are expected to operate at acceptable levels-of-service under existing and future year conditions with the exception of the intersections listed below:

#### E Young Street and Rolesville High School Driveway

Analysis indicates the minor street approaches of The Point South Site Driveway (EB) and Rolesville High School Driveway (WB) are expected to operate with long delays during the weekday AM peak hour and with moderate to long delays during the weekday PM peak hour. It is not expected that 4-hour or 8-hour MUTCD traffic signal warrants would be met.

#### Rolesville Road and Sunset Manor Drive/Site Drive 1

Analysis indicates the minor street approaches of Site Drive 1 (EB) and Sunset Manor Drive (WB) are expected to operate with moderate to long delays during the weekday AM and PM peak hours. However, queue lengths are expected to be short (approximately four vehicles or less). It is not expected that 4-hour or 8-hour MUTCD traffic signal warrants would be met.

## 9. RECOMMENDATIONS

Based on the findings of this study, specific geometric improvements have been identified and are recommended to accommodate future traffic conditions. See a more detailed description of the recommended improvements below. Refer to Figure 12 for an illustration of the recommended lane configuration for the proposed development.

### **Improvements per Rolesville Community Transportation Plan**

Per the current Rolesville Community Transportation (CTP), E Young Street/Rolesville Road is planned to be a two-lane facility with a center turn lane, curb and gutter, bike lanes, and sidewalks. The developer is required to make accommodations for this future cross section along the property frontage.

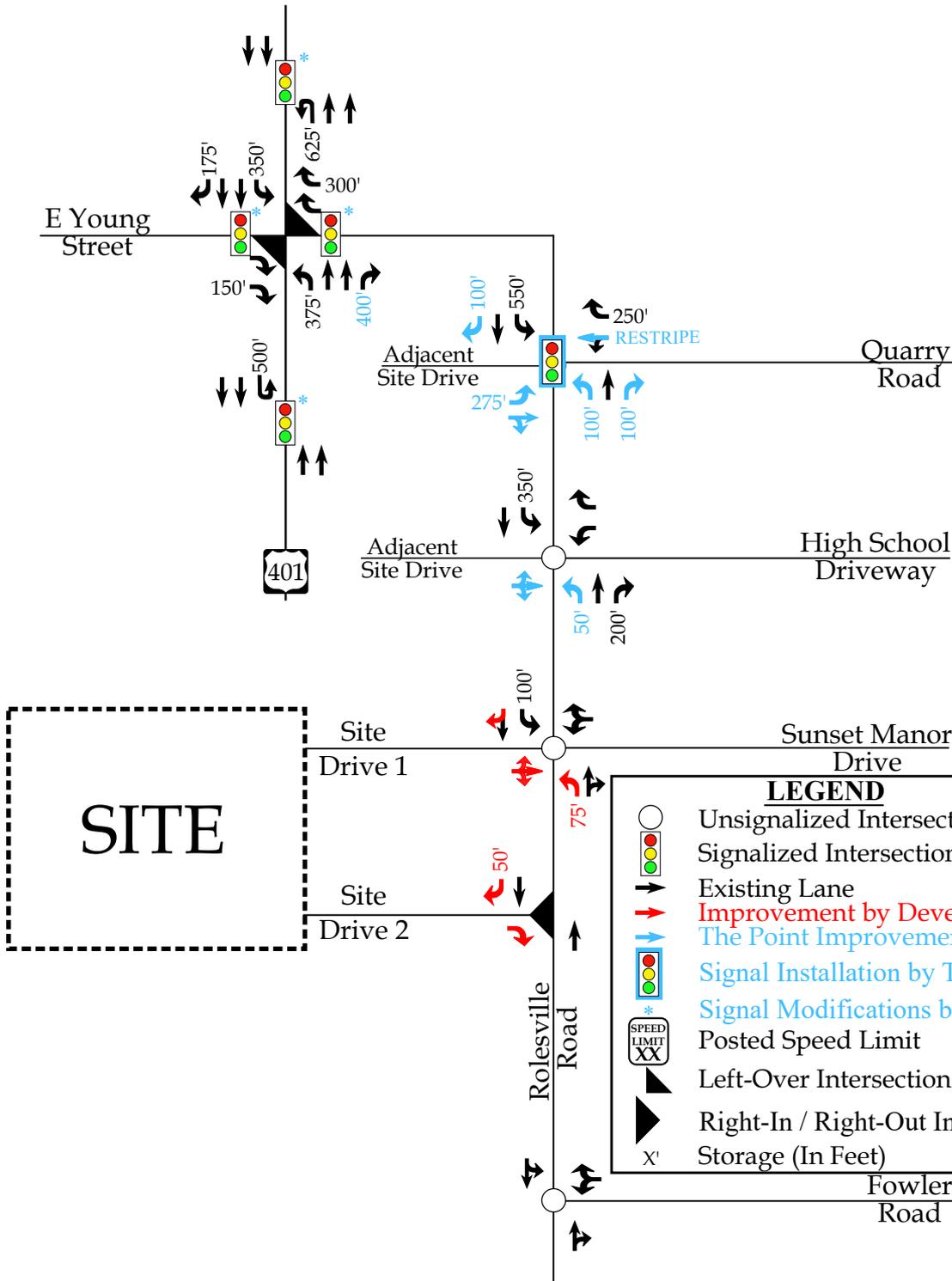
### **Recommended Improvements by Developer**

#### Rolesville Road and Sunset Manor Drive/Site Drive 1

- Construct eastbound approach with one ingress lane and a minimum of one egress lane, striped as a shared left-through-right turn lane. Provide stop control for the eastbound approach.
- Construct an exclusive northbound left turn lane with a minimum of 75 feet of storage and appropriate taper.

#### Rolesville Road and Site Drive 2

- Construct eastbound approach with one ingress lane and one egress lane striped as a right turn lane. Provide stop control for the eastbound approach.
- Construct an exclusive southbound right turn lane with a minimum of 50 feet of storage and appropriate taper.



**LEGEND**

- Unsignalized Intersection
- Signalized Intersection
- Existing Lane
- Improvement by Developer
- The Point Improvement
- Signal Installation by The Point
- Signal Modifications by The Point
- Posted Speed Limit
- Left-Over Intersection
- Right-In / Right-Out Intersection
- Storage (In Feet)



1216 Rolesville Road  
Rolesville, NC

Recommended Lane Configurations

Scale: Not to Scale	Figure 12
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