December 2025

ROLESVILLE GRAVITY-YOUNG COMMERCIAL

Revised Traffic Impact Analysis

LOCATED IN ROLESVILLE, NC

Prepared for:

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EXULT ENGINEERING

This document entitled Rolesville Gravity-Young Street Commercial Revised Traffic Impact Analysis was prepared by Exult Engineering, PC for the account of Gravity Companies LLC. The material in it reflects Exult Engineering's best judgement in light of the information available to them at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Exult Engineering, PC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Rolesville Gravity-Young Street Commercial Revised Traffic Impact Analysis

Prepared by: Melinda Seley (sign)

Date: 12/22/25

Melinda Seley, PE

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Date: 12-22-25

Brittany Chase, PE

EXULT ENGINEERING

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Brittany L.W. Chase 12-22-25

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

The proposed 21.03-acre site is located on the east side of East Young Street, south of Quarry Road in Rolesville, North Carolina. As currently envisioned, the proposed development will consist of a 37,618 square foot grocery store, 28,000 square feet of general retail, a 4,400 square foot fast-food restaurant with drive-thru, a 4,400 square foot coffee shop with drive-thru, 13,000 square feet of general office, and 13,000 square feet of medical office. The proposed site is to be developed by 2027. The property is currently zoned General Commercial-Conditional Zoning (GC-CZ) and does not require rezoning to accommodate the proposed development uses. Proposed access for the site consists of one full movement driveway and one right-in/right-out/left-out driveway on Quarry Road and one full movement driveway on East Young Street.

The purpose of this Traffic Impact Analysis (TIA) is to analyze the potential traffic impacts of the proposed development on the surrounding roadway network and to identify any roadway improvements necessary to mitigate the impact of the project traffic. The *Rolesville Gravity-Young Street Commercial Traffic Impact Analysis* (September 2025) was previously submitted to the Town of Rolesville and the North Carolina Department of Transportation (NCDOT) for review. This report, *Rolesville Gravity-Young Commercial Revised Traffic Impact Analysis* (December 2025), includes updates to incorporate improvements based on NCDOT's initial review and subsequent coordination. NCDOT review comments and correspondence are included in the Appendix.

The scope of the TIA was based on coordination with the North Carolina Department of Transportation (NCDOT) and the Town of Rolesville. A TIA Scoping Memorandum of Understanding (MOU) was prepared and approved by NCDOT and the Town. The TIA Scoping MOU and subsequent correspondence regarding the scope of the TIA is included in the Appendix of this report. The *NCDOT Congestion Management Capacity Analysis Guidelines* and the Town's *Rolesville Next Land Development Ordinance* were referenced to perform this traffic study.

As approved by the Town and NCDOT, the study area includes:

1. East Young Street at US 401 Bypass
2. US 401 Bypass at U-turn North (East) of East Young Street
3. US 401 Bypass at U-turn South (West) of East Young Street
4. East Young Street at Quarry Road/The Point North Driveway
5. Quarry Road at Rolesville High School Staff & Bus Driveway
6. East Young Street at Rolesville High School Student & Carpool Driveway/The Point South Driveway
7. Rolesville Road at Fowler Road/Merritt Property Southern Driveway
8. Rolesville Road at Mitchell Mill Road
9. Quarry Road at Proposed Right-In/Right-Out/Left-Out Site Driveway
10. Quarry Road at Proposed Full Movement Site Driveway
11. East Young Street at Proposed Full Movement Site Driveway

The proposed development is expected to generate 5,610 net new daily trips, 637 net new AM peak hour trips (356 entering, 281 exiting), and 479 net new PM peak hour trips (221 entering, 258 exiting).

Based on coordination with the Town and NCDOT, a 2% growth rate was determined to be appropriate for future volume projections. The growth rate was applied to the existing volumes to determine 2027 background traffic volumes. Approved developments are developments in the vicinity of the proposed site that have been approved but not yet constructed. Based on coordination with NCDOT and the Town, the following four approved developments were considered in the future year traffic volumes:

- The Point – 320 residential townhomes, 621 single family homes, and 122,800 square feet of retail currently under construction along the west side of East Young Street, north and south of US 401 Bypass. Site trips were obtained from the *Revised Traffic Impact Analysis for Young Street PUD* (Kimley-Horn and Associates, Inc., June 2019). Based on coordination with the Town, 33 Certificates of Occupancy had been issued at the time of traffic count data collection. While the TIA studied a buildout year of 2025, the buildout year was assumed to be 2029 based on coordination with a local homebuilder. Therefore, 48% of the site trips were added to the existing traffic count and included in the future year scenarios.
- 1216 Rolesville Road – 68 single family homes and 30,000 square feet of retail located on the west side of Rolesville Road near the Sunset Manor Drive intersection. Site trips were obtained from the *1216 Rolesville Road Traffic Impact Analysis* (Ramey Kemp Associates, February 2023). Based on coordination with the Town, no Certificates of Occupancy had been issued at the time of traffic count data collection, and the site was assumed to be fully built out by 2028. Therefore, 67% of the site trips were included in the future year scenarios.
- Kalas Falls – 439 single family homes and 96 residential townhomes located on the west side of Rolesville Road, north of Mitchell Mill Road. Site trips were obtained from the *Kalas/Watkins Family Property Traffic Impact Analysis* (Stantec Consulting Services Inc., June 2019). Based on coordination with the Town, no Certificates of Occupancy had been issued at the time of traffic count data collection. While the TIA studied a buildout year of 2025, the buildout year was assumed to be 2028 based on coordination with the Town. Therefore, 67% of the site trips were included in the future year scenarios.
- Woodlief Assemblage (Broadmoor) – 158 single family homes and 95 residential townhomes located along the east side of Rolesville Road, south of Fowler Road. Site trips were obtained from the *REZ 23-02: Woodlief Assemblage Traffic Impact Analysis* (Stantec Consulting Services, Inc., July 2023). Based on coordination with the Town, no Certificates of Occupancy had been issued at the time of traffic count data collection, and the site was assumed to be fully built out by 2028. Therefore, 67% of the site trips were included in the future year scenarios.
- Preserve at Moody Farm – 82 single family homes located along the west side of Rolesville Road, north of Mitchell Mill Road. The trip generation was summarized in a letter prepared by Stantec Consulting Services Inc. in October 2021. The site trips were assigned to the study area by applying the same distribution as presented in the Woodlief Assemblage traffic study. As stated in the trip generation letter, The Preserve at Moody Farm is expected to be built out by 2026. Therefore, 100% of the site trips were included in the future year scenarios.
- Rolesville Crossing (Wheeler Tract) – 233 single family homes and 125 residential townhomes located along the east side of Rolesville Road, north of Mitchell Mill Road. Site trips were obtained from the *Wheeler Tract Rolesville Road Traffic Impact Analysis* (Ramey Kemp & Associates, June 2019). Based on coordination with the Town, no Certificates of Occupancy had been issued at the time of traffic count data collection. According to the TIA, the development is expected to be fully built by 2026. Therefore, 100% of the site trips were included in the future year scenarios.

- Tucker Wilkins – 27 single family homes and 64 residential townhomes located along the west side of Rolesville Road, north of Mitchell Mill Road. The trip generation was summarized in a letter prepared by Stantec Consulting Services Inc. in October 2021. The site trips were assigned to the study area by applying the same distribution as presented in the Woodlief Assemblage traffic study. As stated in the trip generation letter, Tucker Wilkins Property is expected to be built out by 2026. Therefore, 100% of the site trips were included in the future year scenarios.
- Merritt Property – 227 senior adult single family detached homes, 278 senior adult attached homes, 21,000 square feet of retail, and a 15,000 square foot pharmacy with drive-thru located along the west side of Rolesville Road near the Fowler Road intersection. Site trips were obtained from the *REZ 24-01: Merritt Property Traffic Impact Analysis* (Stantec Consulting Services Inc., September 2024). Based on coordination with the Town, no Certificates of Occupancy had been issued at the time of traffic count data collection. According to the TIA, the development is expected to be fully built by 2028. Therefore, 67% of the site trips were included in the future year scenarios.

Approved development traffic information is included in the Appendix.

To determine the traffic impacts of the proposed development, capacity analyses were performed at the study intersections under the following scenarios:

- Existing (2025) Traffic Conditions
- No-Build (2027) Traffic Conditions
- Buildout (2027) Traffic Conditions
- Buildout (2027) Traffic Conditions with Recommended Improvements

Based on requirements by the Town and NCDOT, the following roadway improvements are committed to by others and were included in the future year no-build and buildout scenarios:

East Young Street at US 401 Bypass:

- Extend the eastbound right-turn lane on US 401 to provide 400 feet of full-width storage. (The Point)
- Extend the second northbound right-turn lane on East Young Street to provide 600 feet of full-width storage (Woodlief Assemblage/Broadmoor)
- Convert the eastbound right-turn lane on US 401 to a free-flow right-turn lane. (Merritt Property)
- Construct a second southbound receiving lane on East Young Street that drops at The Point North Driveway. (Merritt Property)

US 401 Bypass at U-turn North (East) of East Young Street:

- Construct a second eastbound U-turn lane on US 401 with 400 feet of full-width storage (Woodlief/Broadmoor)

East Young Street at Quarry Road/The Point North Driveway:

- Install a traffic signal (The Point)
- Extend the southbound right-turn lane on East Young Street to provide continuous storage to US 401 Bypass. (Merritt Property)

East Young Street at Rolesville High School Student & Carpool Driveway/The Point South Driveway:

- Monitor for signalization and install traffic signal, if warranted. (Woodlief Assemblage/ Broadmoor)

Rolesville Road at Fowler Road/Merritt Property Southern Driveway:

- Construct the Merritt Property Southern Driveway/Fowler Road Extension as the west leg of the intersection and provide one ingress and egress lane.
- Construct a southbound right-turn lane on Rolesville Road with 100 feet of full-width storage. (Merritt Property)
- Construct a southbound left-turn lane on Rolesville Road with 100 feet of full-width storage. (Merritt Property)
- Construct a northbound left-turn lane on Rolesville Road with 100 feet of full-width storage. (Merritt Property)
- Monitor for signalization and install traffic signal, if warranted. (Merritt Property)

Rolesville Road at Mitchell Mill Road:

- Install a traffic signal. (multiple developer agreement)

All of the committed improvements listed above are assumed to be in place by 2027 due to the likelihood that each improvement will be constructed prior to the full buildout year of the subject approved development.

Based on the capacity analysis presented herein, the following roadway improvements are recommended to be completed by the developer to accommodate project traffic:

East Young Street at Quarry Road/The Point North Driveway:

- Construct a second northbound through lane on East Young Street with 300 feet of storage and appropriate taper and the associated northbound receiving lane to tie into the second northbound right-turn lane at US 401.
- Restripe the eastbound approach of The Point North Driveway to consist of a shared through/left-turn lane and an exclusive right-turn lane.

Quarry Road at Proposed Right-In/Right-Out/Left-Out Site Driveway:

- Construct an exclusive eastbound right-turn lane on Quarry Road with 50 feet of storage and appropriate taper.
- Provide one ingress and one egress lane on the south leg of Proposed Right-In/Right-Out/Left-Out Site Driveway.

Quarry Road at Proposed Full Movement Site Driveway:

- Construct an exclusive westbound left-turn lane on Quarry Road with 50 feet of storage and appropriate taper.
- Construct an exclusive eastbound right-turn lane on Quarry Road with 125 feet of storage and appropriate taper.
- Provide one ingress and one egress lane on the south leg of Proposed Full Movement Site Driveway.

East Young Street at Proposed Full Movement Site Driveway:

- Construct an exclusive northbound right-turn lane on East Young Street with 100 feet of full-width storage and appropriate taper.
- Restripe the existing two-way left-turn lane on East Young Street to an exclusive southbound left-turn lane with 200 feet of storage.
- Provide one ingress and two egress lanes on the east leg of Proposed Full Movement Site Driveway. The two egress lanes should consist of a left-turn lane and a right-turn lane with 225 feet of full-width storage and appropriate taper.

INTRODUCTION

The proposed 21.03-acre site is located on the east side of East Young Street, south of Quarry Road in Rolesville, North Carolina as shown on Figure 1. As currently envisioned, the proposed development will consist of a 37,618 square foot grocery store, 28,000 square feet of general retail, a 4,400 square foot fast-food restaurant with drive-thru, a 4,400 square foot coffee shop with drive-thru, 13,000 square feet of general office, and 13,000 square feet of medical office. The proposed site is to be developed by 2027. The property is currently zoned General Commercial-Conditional Zoning (GC-CZ) and does not require rezoning to accommodate the proposed development uses. As shown on Figure 2, proposed access for the site consists of one full movement driveway and one right-in/right-out/left-out driveway on Quarry Road and one full movement driveway on East Young Street.

The purpose of this TIA is to analyze the potential traffic impacts of the proposed development on the surrounding roadway network and to identify any roadway improvements necessary to mitigate the impact of the project traffic. The *Rolesville Gravity-Young Street Commercial Traffic Impact Analysis* (September 2025) was previously submitted to the Town of Rolesville and the North Carolina Department of Transportation (NCDOT) for review. This report, *Rolesville Gravity-Young Commercial Revised Traffic Impact Analysis* (December 2025), includes updates to incorporate improvements based on NCDOT's initial review and subsequent coordination. NCDOT review comments and correspondence are included in the Appendix.

This study includes analysis of the following traffic scenarios:

- Existing (2025) Traffic Conditions
- No-Build (2027) Traffic Conditions
- Buildout (2027) Traffic Conditions
- Buildout (2027) Traffic Conditions with Recommended Improvements

Based on coordination with the Town and NCDOT, a 2% growth rate was determined to be appropriate for future volume projections. The growth rate was applied to the existing volumes to determine 2027 background traffic volumes. Approved developments are developments in the vicinity of the proposed site that have been approved but not yet constructed. Based on coordination with NCDOT and the Town, the following four approved developments were considered in the future year traffic volumes:

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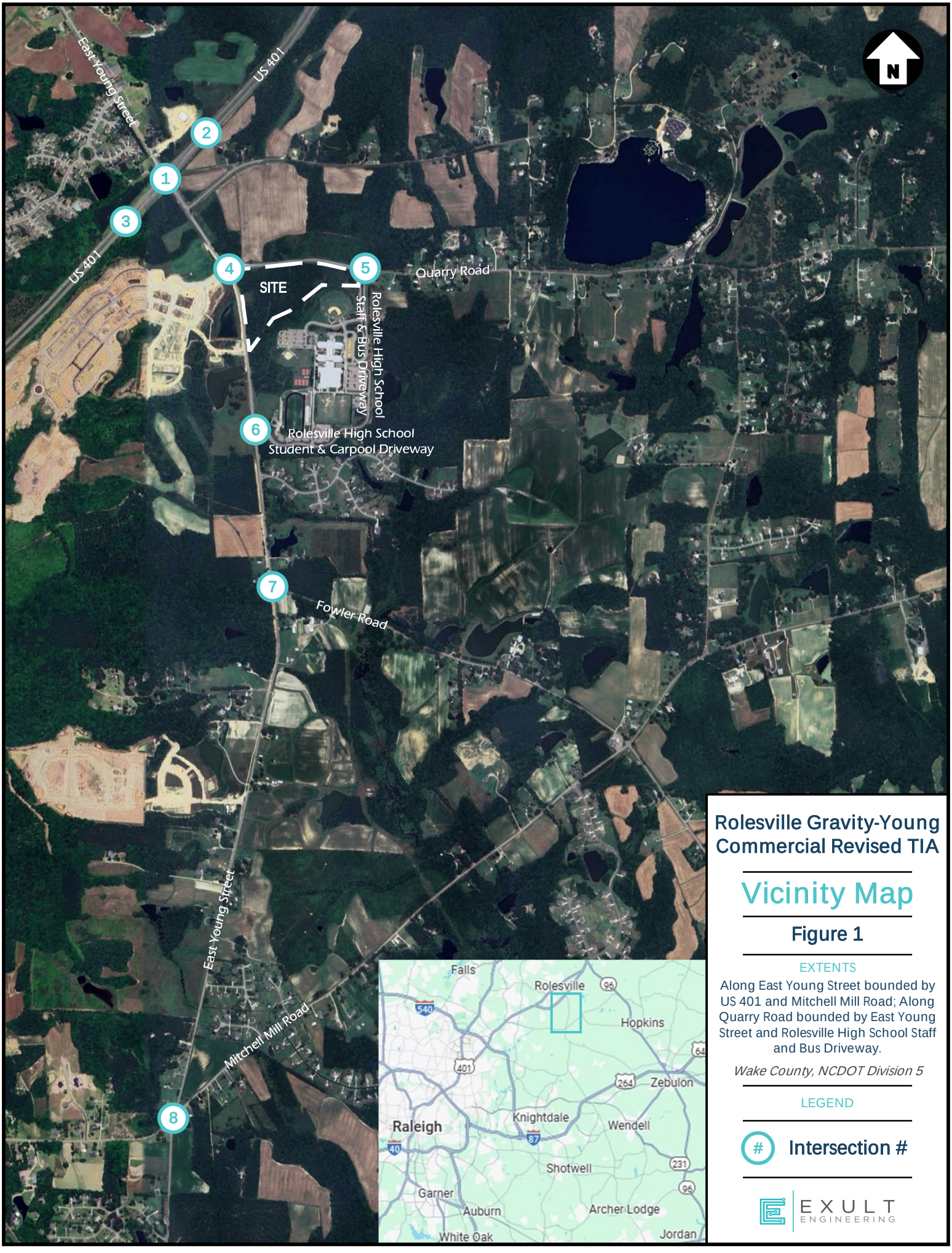


Rolesville Gravity-Young Commercial Revised TIA

Vicinity Map

Figure 1

EXTENTS

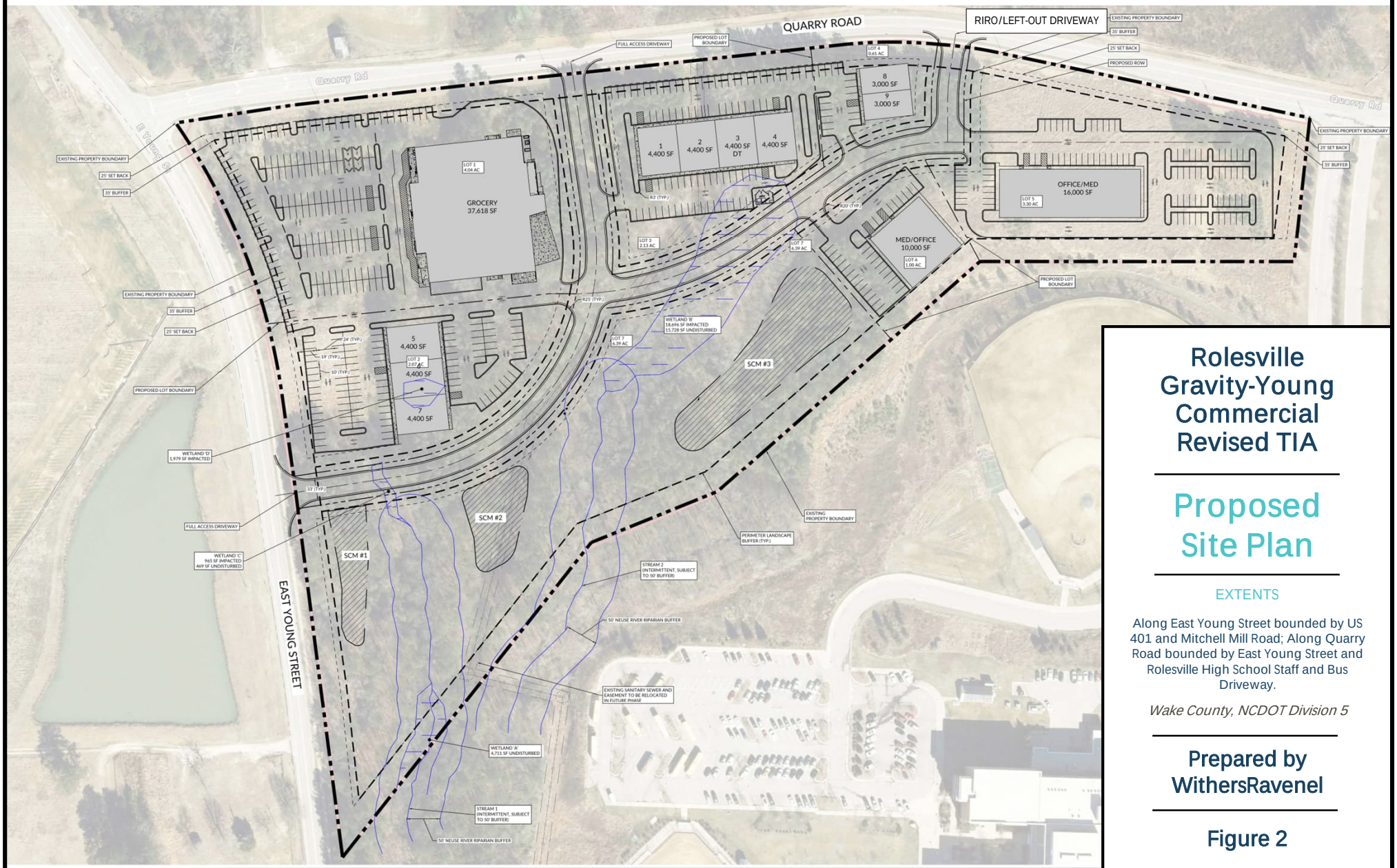
Along East Young Street bounded by US 401 and Mitchell Mill Road; Along Quarry Road bounded by East Young Street and Rolesville High School Staff and Bus Driveway.

Wake County, NCDOT Division 5

LEGEND

(#) Intersection #

EXULT ENGINEERING



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GRAVITY ROLESVILLE - YOUNG STREET COMMERCIAL
PRELIMINARY SITE PLAN LAYOUT - OPTION 4

Rolesville Gravity-Young Commercial Revised TIA

Proposed Site Plan

EXTENTS

Along East Young Street bounded by US 401 and Mitchell Mill Road; Along Quarry Road bounded by East Young Street and Rolesville High School Staff and Bus Driveway.

Wake County, NCDOT Division 5

Prepared by WithersRavenel

Figure 2

EXULT ENGINEERING

EXISTING CONDITIONS

The proposed 21.03-acre site is located on the east side of East Young Street, south of Quarry Road in Rolesville, North Carolina. The property is currently zoned General Commercial-Conditional Zoning (GC-CZ). Per the Town and NCDOT, the study area for the proposed development includes the following intersections:

1. East Young Street at US 401 Bypass*
2. US 401 Bypass at U-turn North (East) of East Young Street*
3. US 401 Bypass at U-turn South (West) of East Young Street*
4. East Young Street at Quarry Road/The Point North Driveway
5. Quarry Road at Rolesville High School Staff & Bus Driveway
6. East Young Street at Rolesville High School Student & Carpool Driveway/The Point South Driveway
7. Rolesville Road at Fowler Road/Merritt Property Southern Driveway
8. Rolesville Road at Mitchell Mill Road
9. Quarry Road at Proposed Right-In/Right-Out/Left-Out Site Driveway
10. Quarry Road at Proposed Full Movement Site Driveway
11. East Young Street at Proposed Full Movement Site Driveway

A site visit was performed on Tuesday, June 10, 2025, to observe existing field conditions such as lane geometry, posted speed limits, and traffic operations. Figure 3 shows the Existing Lane Geometry at the above existing study intersections.

Peak-hour turning movement traffic counts were performed at the existing study intersections during the AM (6:30 – 9:00) and PM (4:00 – 6:00) peak periods on Tuesday, May 20, 2025, while school was in session. The Rolesville High School bells schedule runs from 7:20 am – 2:18 pm. The PM peak hour of the high school is not expected to overlap with the PM peak hour of the proposed site. However, the AM peak hours for the schools and the proposed site may overlap. Therefore, in order to appropriately capture the high school traffic, the morning data collection time period was extended to begin at 6:30 AM.

*Due to the closure of East Young Street at Main Street in Rolesville north of the study area, traffic count data will be supplemented with 2024 traffic count data collected on January 30th that was used in a local signal timing project. The annual growth rate will be applied to estimate 2025 volumes at these three intersections.

Traffic count data is included in the Appendix of this report. Adjustments were made to account for any imbalances in the traffic count volumes not justified given the number of access points and land uses located between study intersections. Figure 4 shows the 2025 AM and PM Peak Hour Existing Traffic Volumes for the study intersections.

US 401 Bypass is currently a 4-lane divided roadway with a posted speed of 55 miles per hour (mph). US 401 Bypass is classified as a Principal Arterial on the *NCDOT Functional Class Map*. According to the *NCDOT Annual Average Daily Traffic (AADT) Mapping Application*, US 401 Bypass has a 2023 average annual daily traffic volume (AADT) of 20,000 vehicles per day (vpd) east of South Main Street/US 401 and a 2023 AADT of 16,000 vpd east of Pulley Town Road.

East Young Street/Rolesville Road is currently a 2-lane roadway with center two-way left-turn lane (or equivalent pavement) from US 401 Bypass to Sunset Manor Drive. As the proposed and approved developments are built along East Young Street/Rolesville Road, the center two-way left-turn lane will be constructed. East Young Street/Rolesville Road has a posted speed limit of 45 mph, with a speed limit of 35 mph during school hours in the vicinity of Rolesville High School. East Young Street/Rolesville Road is classified as a Minor Arterial on the *NCDOT Functional Class Map*. According to the *NCDOT Annual Average Daily Traffic (AADT) Mapping Application*, East Young Street/Rolesville Road has a 2023 AADT of 6,500 vpd north of Fowler Road and a 2023 AADT of 4,700 vpd north of Mitchell Mill Road.

Quarry Road is currently a 2-lane undivided roadway with a posted speed limit of 45 mph and a speed limit of 35 mph during school hours in the vicinity of Rolesville High School. Quarry Road is classified as a Local Road on the *NCDOT Functional Class Map*. According to the *NCDOT Annual Average Daily Traffic (AADT) Mapping Application*, Main Street has a 2023 AADT of 2,100 vpd east of East Young Street.

Fowler Road is currently a 2-lane undivided roadway with a posted speed limit of 45 mph. Fowler Road is classified as a Major Collector on the *NCDOT Functional Class Map*. According to the *NCDOT Annual Average Daily Traffic (AADT) Mapping Application*, Creedmoor Road/Brogden Road has a 2023 AADT of 1,600 vpd.

Mitchell Mill Road is currently a 2-lane undivided roadway with a posted speed limit of 45 miles per hour (mph). Mitchell Mill Road is classified as a Major Collector on the *NCDOT Functional Class Map*. According to the *NCDOT Interactive Traffic Volume Map*, Mitchell Mill Road has a 2023 AADT of 3,000 vpd east of Rolesville Road.

N

E Young St

800 ft

800 ft

SPEED LIMIT 35

125' storage

240' storage

400' storage

US 401

SPEED LIMIT 55

445' storage

500' storage

255' storage

U-turn South of E Young St

280' storage

590' storage

U-turn North of E Young St

SPEED LIMIT 55

US 401

1,500 ft

SPEED LIMIT 45

1,900 ft

325' storage

545' storage

The Point North Dwy

SPEED LIMIT 25

260' storage

275' storage

4

SCHOOL SPEED LIMIT 35

5

185' storage

SPEED LIMIT 45

Quarry Rd

125' storage

155' storage

Continuous

Continuous

SCHOOL SPEED LIMIT 35

Rolesville High School Staff & Bus Dwy

2,200 ft

TWLTL

TWLTL

285' storage

Continuous

Continuous

The Point South Dwy

SPEED LIMIT 15

6

SPEED LIMIT 15

Rolesville High School Student & Carpool Dwy

90' storage

360' storage

SCHOOL SPEED LIMIT 35

SPEED LIMIT 45

2,100 ft

E Young St

7

SPEED LIMIT 45

Fowler Rd

Rolesville Rd

1.40 mi

SPEED LIMIT 45

325' storage

Mitchell Mill Rd

SPEED LIMIT 45

8

Rolesville Gravity-Young Commercial Revised TIA

Existing Lane Geometry

LEGEND

Stop Control

Approach Lane

Speed Limit

Departure Lane

Signal Control

XX' Intersection Spacing

XX' - FULL STORAGE LENGTH

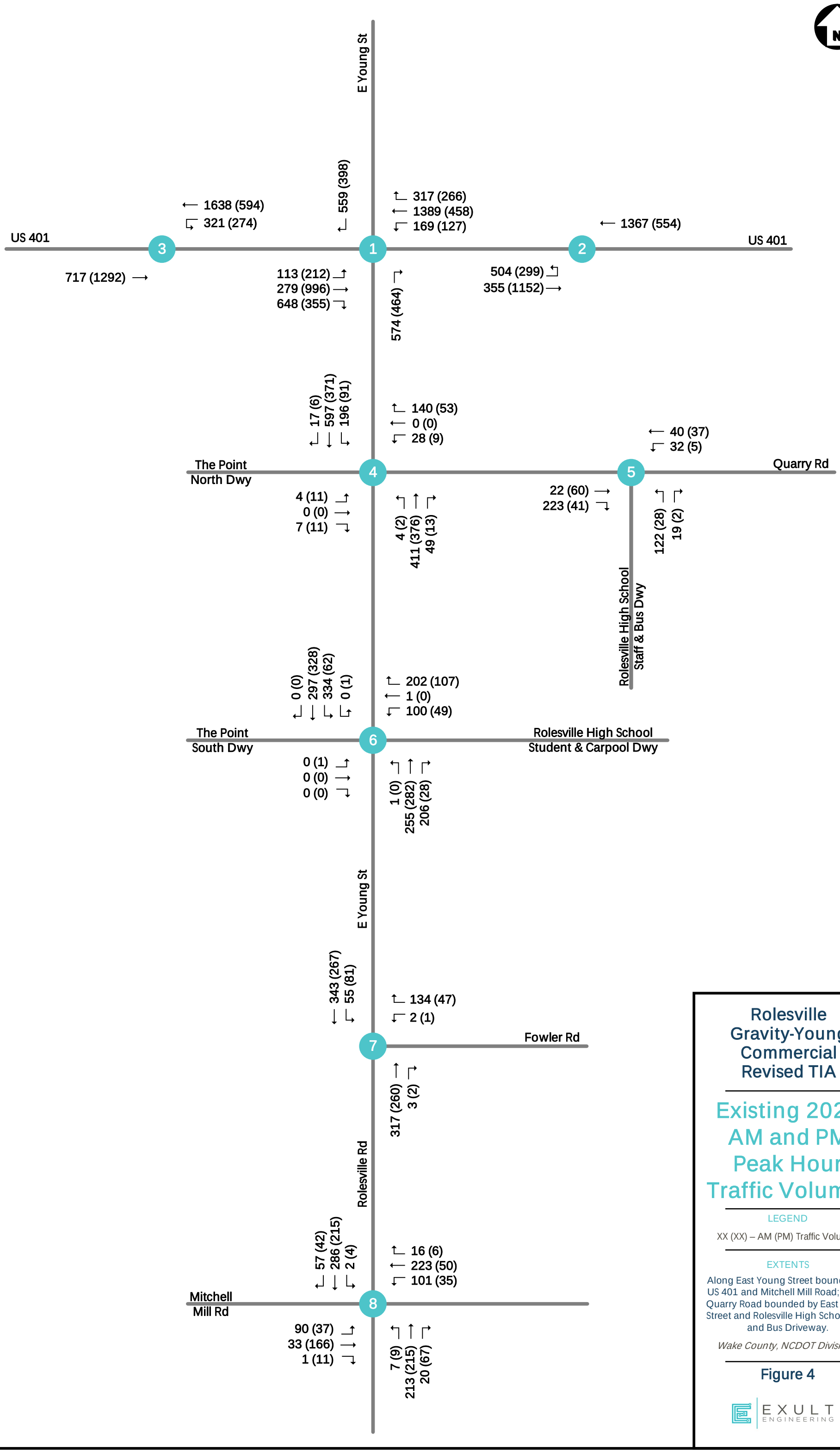
EXTENTS

Along East Young Street bounded by US 401 and Mitchell Mill Road; Along Quarry Road bounded by East Young Street and Rolesville High School Staff and Bus Driveway.

Wake County, NCDOT Division 5

Figure 3

EXULT ENGINEERING



Rolesville Gravity-Young Commercial Revised TIA

Existing 2025 AM and PM Peak Hour Traffic Volumes

LEGEND

XX (XX) – AM (PM) Traffic Volumes

EXTENTS

Along East Young Street bounded by US 401 and Mitchell Mill Road; Along Quarry Road bounded by East Young Street and Rolesville High School Staff and Bus Driveway.

Wake County, NCDOT Division 5

Figure 4

EXULT ENGINEERING

FUTURE CONDITIONS

The proposed site is to be developed by the year 2027. The projected 2027 no-build traffic volumes consist of existing 2025 traffic volumes plus background growth and approved development traffic.

Based on coordination with the Town and NCDOT, a 2% growth rate was determined to be appropriate for future volume projections. The growth rate was applied to the existing volumes to determine 2027 background traffic volumes. Approved developments are developments in the vicinity of the proposed site that have been approved but not yet constructed. Based on coordination with NCDOT and the Town, the following four approved developments were considered in the future year traffic volumes:

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- Kalas Falls – 439 single family homes and 96 residential townhomes located on the west side of Rolesville Road, north of Mitchell Mill Road. Site trips were obtained from the *Kalas/Watkins Family Property Traffic Impact Analysis* (Stantec Consulting Services Inc., June 2019). Based on coordination with the Town, no Certificates of Occupancy had been issued at the time of traffic count data collection. While the TIA studied a buildout year of 2025, the buildout year was assumed to be 2028 based on coordination with the Town. Therefore, 67% of the site trips were included in the future year scenarios.
- Woodlief Assemblage (Broadmoor) – 158 single family homes and 95 residential townhomes located along the east side of Rolesville Road, south of Fowler Road. Site trips were obtained from the *REZ 23-02: Woodlief Assemblage Traffic Impact Analysis* (Stantec Consulting Services, Inc., July 2023). Based on coordination with the Town, no Certificates of Occupancy had been issued at the time of traffic count data collection, and the site was assumed to be fully built out by 2028. Therefore, 67% of the site trips were included in the future year scenarios.
- Preserve at Moody Farm – 82 single family homes located along the west side of Rolesville Road, north of Mitchell Mill Road. The trip generation was summarized in a letter prepared by Stantec Consulting Services Inc. in October 2021. The site trips were assigned to the study area by applying the same distribution as presented in the Woodlief Assemblage traffic study. As stated in the trip generation letter, The Preserve at Moody Farm is expected to be built out by 2026. Therefore, 100% of the site trips were included in the future year scenarios.
- Rolesville Crossing (Wheeler Tract) – 233 single family homes and 125 residential townhomes located along the east side of Rolesville Road, north of Mitchell Mill Road. Site trips were obtained

from the *Wheeler Tract Rolesville Road Traffic Impact Analysis* (Ramey Kemp & Associates, June 2019). Based on coordination with the Town, no Certificates of Occupancy had been issued at the time of traffic count data collection. According to the TIA, the development is expected to be fully built by 2026. Therefore, 100% of the site trips were included in the future year scenarios.

- Tucker Wilkins – 27 single family homes and 64 residential townhomes located along the west side of Rolesville Road, north of Mitchell Mill Road. The trip generation was summarized in a letter prepared by Stantec Consulting Services Inc. in October 2021. The site trips were assigned to the study area by applying the same distribution as presented in the Woodlief Assemblage traffic study. As stated in the trip generation letter, Tucker Wilkins Property is expected to be built out by 2026. Therefore, 100% of the site trips were included in the future year scenarios.
- Merritt Property – 227 senior adult single family detached homes, 278 senior adult attached homes, 21,000 square feet of retail, and a 15,000 square foot pharmacy with drive-thru located along the west side of Rolesville Road near the Fowler Road intersection. Site trips were obtained from the *REZ 24-01: Merritt Property Traffic Impact Analysis* (Stantec Consulting Services Inc., September 2024). Based on coordination with the Town, no Certificates of Occupancy had been issued at the time of traffic count data collection. According to the TIA, the development is expected to be fully built by 2028. Therefore, 67% of the site trips were included in the future year scenarios.

Information provided by NCDOT and the Town related to the approved developments as well as trip generation and distribution information is included in the Appendix.

The projected no-build traffic volumes at the study intersections are shown in Figure 5 (2027 AM Peak Hour No-Build Traffic Volumes) and Figure 6 (2027 PM Peak Hour No-Build Traffic Volumes). Traffic volume calculations are also included in the Appendix of this report.

Based on requirements by the Town and NCDOT, the following roadway improvements are committed to by others and were included in the future year no-build and buildout scenarios:

East Young Street at US 401 Bypass:

- Extend the eastbound right-turn lane on US 401 to provide 400 feet of full-width storage. (The Point)
- Extend the second northbound right-turn lane on East Young Street to provide 600 feet of full-width storage (Woodlief Assemblage/Broadmoor)
- Convert the eastbound right-turn lane on US 401 to a free-flow right-turn lane. (Merritt Property)
- Construct a second southbound receiving lane on East Young Street that drops at The Point North Driveway. (Merritt Property)

US 401 Bypass at U-turn North (East) of East Young Street:

- Construct a second eastbound U-turn lane on US 401 with 400 feet of full-width storage (Woodlief/Broadmoor)

East Young Street at Quarry Road/The Point North Driveway:

- Install a traffic signal (The Point)
- Extend the southbound right-turn lane on East Young Street to provide continuous storage to US 401 Bypass. (Merritt Property)

East Young Street at Rolesville High School Student & Carpool Driveway/The Point South Driveway:

- Monitor for signalization and install traffic signal, if warranted. (Woodlief Assemblage/ Broadmoor)

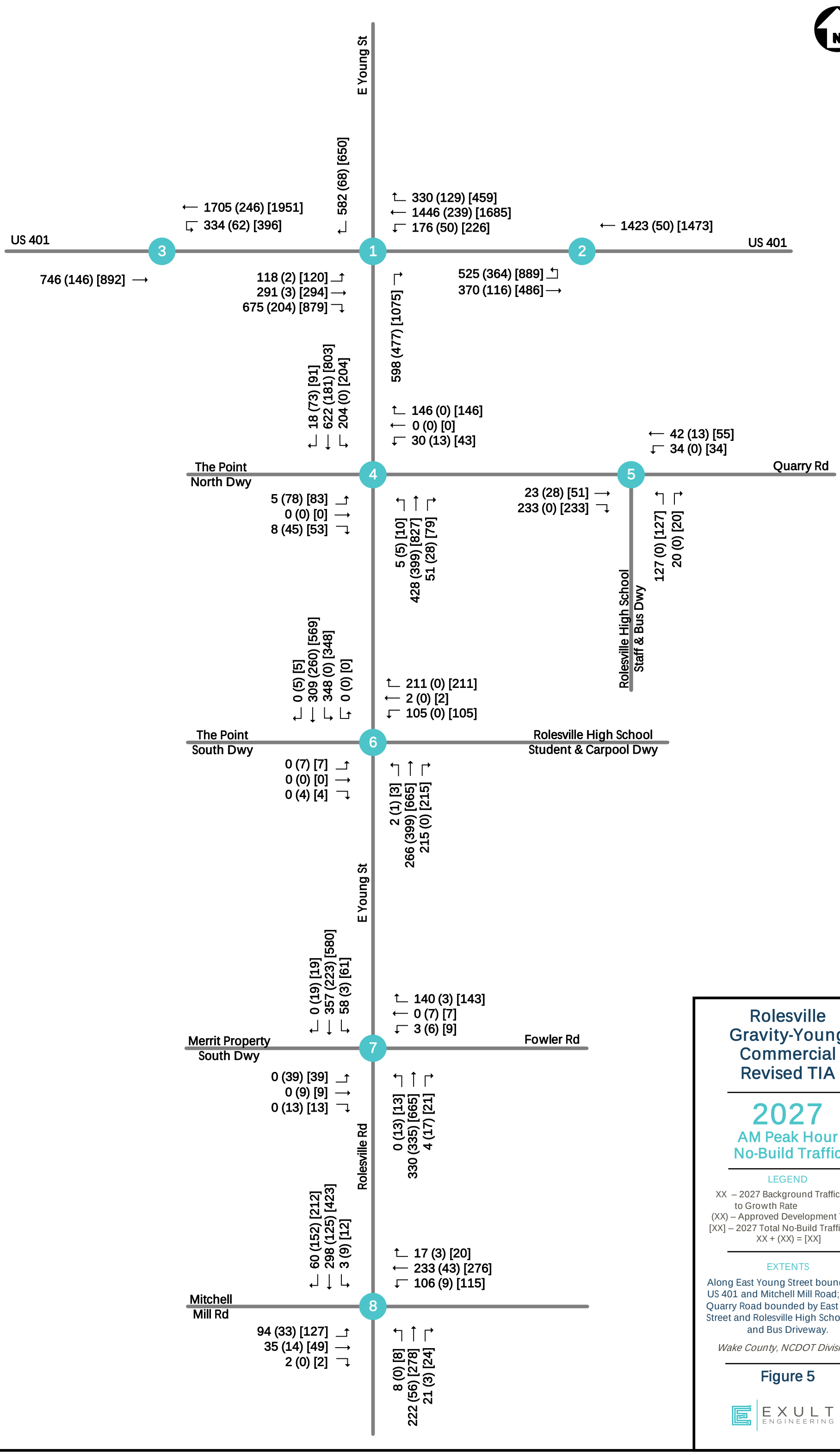
Rolesville Road at Fowler Road/Merritt Property Southern Driveway:

- Construct the Merritt Property Southern Driveway/Fowler Road Extension as the west leg of the intersection and provide one ingress and egress lane.
- Construct a southbound right-turn lane on Rolesville Road with 100 feet of full-width storage. (Merritt Property)
- Construct a southbound left-turn lane on Rolesville Road with 100 feet of full-width storage. (Merritt Property)
- Construct a northbound left-turn lane on Rolesville Road with 100 feet of full-width storage. (Merritt Property)
- Monitor for signalization and install traffic signal, if warranted. (Merritt Property)

Rolesville Road at Mitchell Mill Road:

- Install a traffic signal. (multiple developer agreement)

All the committed improvements listed above are assumed to be in place by 2027 due to the likelihood that each improvement will be constructed prior to the full buildout year of the subject approved development.



Rolesville Gravity-Young Commercial Revised TIA

2027
AM Peak Hour No-Build Traffic

LEGEND

XX – 2027 Background Traffic Due to Growth Rate
(XX) – Approved Development Traffic
[XX] – 2027 Total No-Build Traffic
XX + (XX) = [XX]

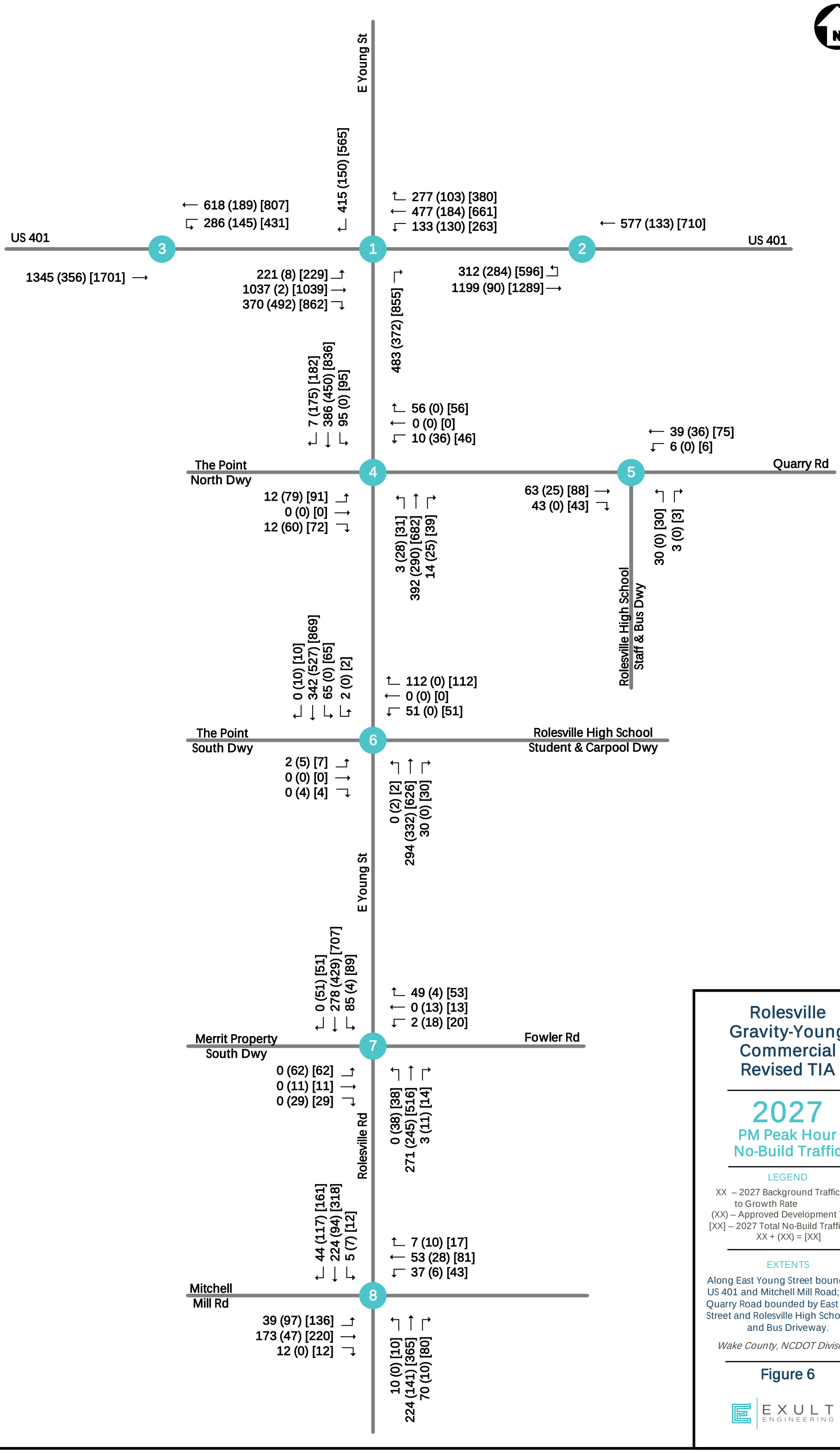
EXTENTS

Along East Young Street bounded by US 401 and Mitchell Mill Road; Along Quarry Road bounded by East Young Street and Rolesville High School Staff and Bus Driveway.

Wake County, NCDOT Division 5

Figure 5

EXULT ENGINEERING



Rolesville Gravity-Young Commercial Revised TIA

2027

PM Peak Hour No-Build Traffic

LEGEND

XX – 2027 Background Traffic Due to Growth Rate
(XX) – Approved Development Traffic
[XX] – 2027 Total No-Build Traffic
XX + (XX) = [XX]

EXTENTS

Along East Young Street bounded by US 401 and Mitchell Mill Road; Along Quarry Road bounded by East Young Street and Rolesville High School Staff and Bus Driveway.

Wake County, NCDOT Division 5

Figure 6

EXULT ENGINEERING

PROPOSED SITE

The proposed 21.03-acre site is located on the east side of East Young Street, south of Quarry Road in Rolesville, North Carolina. As currently envisioned, the proposed development will consist of a 37,618 square foot grocery store, 28,000 square feet of general retail, a 4,400 square foot fast-food restaurant with drive-thru, a 4,400 square foot coffee shop with drive-thru, 13,000 square feet of general office, and 13,000 square feet of medical office. The proposed site is to be developed by 2027. The property is currently zoned General Commercial-Conditional Zoning (GC-CZ) and does not require rezoning to accommodate the proposed development uses. Proposed access for the site consists of one full movement driveway and one right-in/right-out/left-out driveway on Quarry Road and one full movement driveway on East Young Street.

Table 1 shows the projected trip generation for the proposed development, which includes consideration of internal capture and pass-by trip reductions. The trip generation was based on rates and equations published in the ITE *Trip Generation Manual,* 11th Edition.

Table 1: Trip Generation

Land Use		Daily	AM Peak Hour			PM Peak Hour		
			Total	Enter	Exit	Total	Enter	Exit
710: General Office Building	13,000 s.f.	198	29	25	4	31	5	26
720: Medical-Dental Office Building	13,000 s.f.	452	38	30	8	50	15	35
822: Strip Retail Plaza (<40K)	28,000 s.f.	1,526	66	40	26	185	92	93
850: Supermarket	37,600 s.f.	3,528	255	133	122	346	176	170
934: Fast-Food Restaurant with Drive-Thru	4,400 s.f.	2,058	196	100	96	145	76	69
937: Coffee/Donut Shop with Drive-Thru	4,400 s.f.	2,348	378	193	185	172	86	86
Subtotal		10,110	962	521	441	929	450	479
Internal Capture								
Office		-	21	10	11	22	10	12
Retail		-	39	18	21	126	73	53
Restaurant		-	49	27	22	117	49	68
Internal Capture Total		2,650	109	55	54	265	132	133
Pass-By Trips								
710: General Office Building		0	0	0	0	0	0	0
720: Medical-Dental Office Building		0	0	0	0	0	0	0
822: Strip Retail Plaza (<40K)		570	0	0	0	57	27	30
850: Supermarket		640	0	0	0	64	31	33
934: Fast-Food Restaurant with Drive-Thru		500	90	46	44	50	29	21
937: Coffee/Donut Shop with Drive-Thru		590	174	88	86	59	33	26
Pass-by Trips Total		*2,300*	*264*	*134*	*130*	*230*	*120*	*110*
Adjacent Street Traffic Volumes			*2,156*			*1,852*		
Pass-by Maximum *(10% Adjacent Street Traffic)*			*216*	*110*	*106*	*185*	*97*	*88*
Pass-by Trips Applied		1,850	216	110	106	185	97	88
Total Net New External Site Trips		5,610	637	356	281	479	221	258

References: *Trip Generation Manual*, 11th Edition, Institute of Transportation Engineers, September 2021

Internal capture accounts for trips from the site that are expected to access multiple land uses within the site during a given trip. Internal capture rates were applied based on methodology presented in the *ITE Trip Generation Handbook*, 3rd Edition. The NCDOT Sample Internal Capture Spreadsheet was used for internal capture calculations. A conservative vehicle occupancy of 1.10 was assumed.

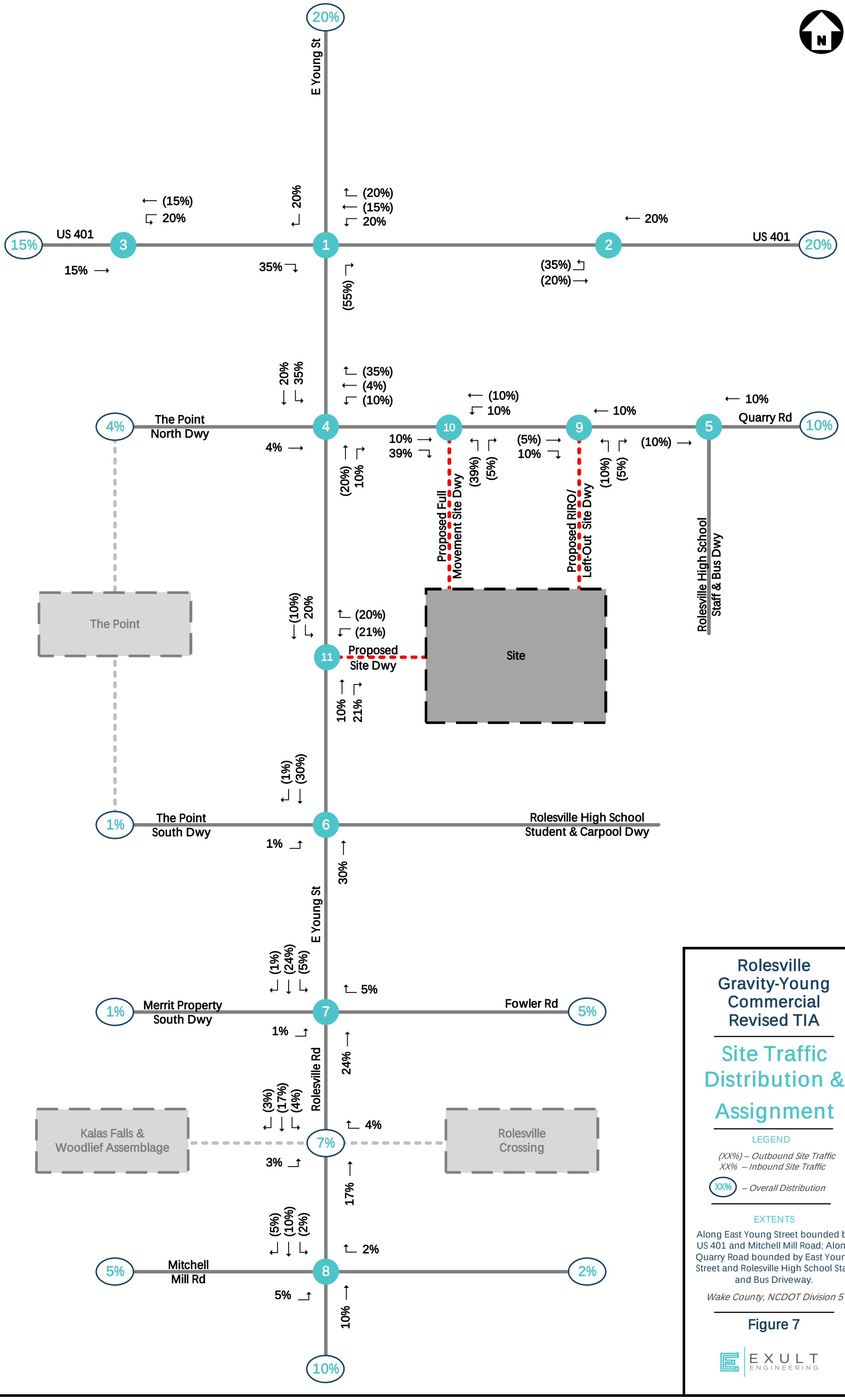
Pass-by trips were also considered for the applicable land uses. Pass-by trips are trips that are already utilizing the surrounding roadway network regardless of if the site has been developed or not. These trips enter the site, exit the site, and continue to respective destinations. Pass-by rates were obtained from the *2021 Pass-By Tables for ITE (TripGen Appendices)* and applied to the subject land uses. Pass-by trips were limited to 10% of the adjacent street (East Young Street and Quarry Road) 2027 no-build traffic volumes. Pass-by trips were assigned based on the existing traffic patterns as determined from the traffic counts.

As shown in Table 1, the proposed development is expected to generate 5,610 net new daily trips, 637 net new AM peak hour trips (356 entering, 281 exiting), and 479 net new PM peak hour trips (221 entering, 258 exiting). Detailed trip generation calculations are included in the Appendix.

Based on the surrounding land uses and access to major commuter roads, the proposed trip distribution for the site is as follows:

- 20% to/from the north on Young Street – dense residential
- 20% to/from the east on US 401 – minimal grocery and retail options to the east
- 15% to/from the west on US 401 – multiple grocery stores to the north and west of the site
- 10% to/from the east on Quarry Road – most direct route to site from NC 96
- 5% to/from the east on Fowler Road – rural residential access (plus access from Woodlief)
- 2% to/from the east on Mitchell Mill – rural residential access (plus access from Rolesville Crossing)
- 10% to/from the south on Rolesville Road – rural residential access
- 5% to/from the west on Mitchel Mill
- 7% to/from Kallas, Woodlief, Rolesville Crossing (approximately 1,150 residential units total)
- 1% to/from Merritt Properties (senior housing so less during peak hours)
- 5% to/from The Point (900 residential units)

The proposed site trip distribution was approved by NCDOT. Figure 7 shows the Site Traffic Distribution and Assignment at each of the study intersections. The trip assignment was applied to the trips generated for the proposed development to determine the projected AM and PM peak hour site traffic volumes. The projected AM and PM peak hour site traffic volumes were added to the 2027 no-build traffic volumes to determine the buildout traffic volumes at the study intersections. The projected buildout traffic volumes at the study intersections are shown in Figure 8 (2027 AM Peak Hour Buildout Traffic Volumes) and Figure 9 (2027 PM Peak Hour Buildout Traffic Volumes).



Rolesville Gravity-Young Commercial Revised TIA

Site Traffic Distribution & Assignment

LEGEND

(XX%) – Outbound Site Traffic
XX% – Inbound Site Traffic

XX% *– Overall Distribution*

EXTENTS

Along East Young Street bounded by US 401 and Mitchell Mill Road; Along Quarry Road bounded by East Young Street and Rolesville High School Staff and Bus Driveway.

Wake County, NCDOT Division 5

Figure 7

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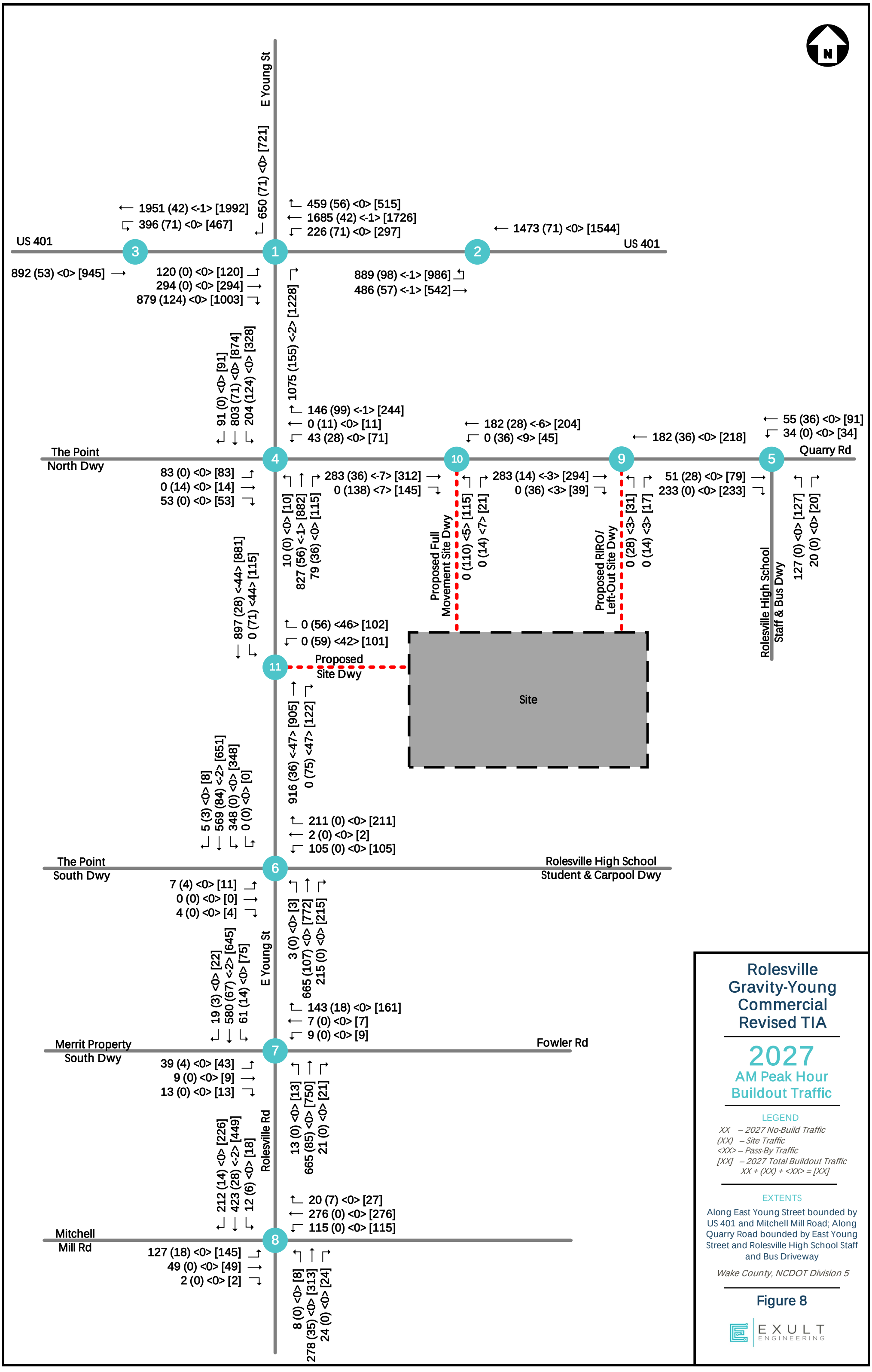
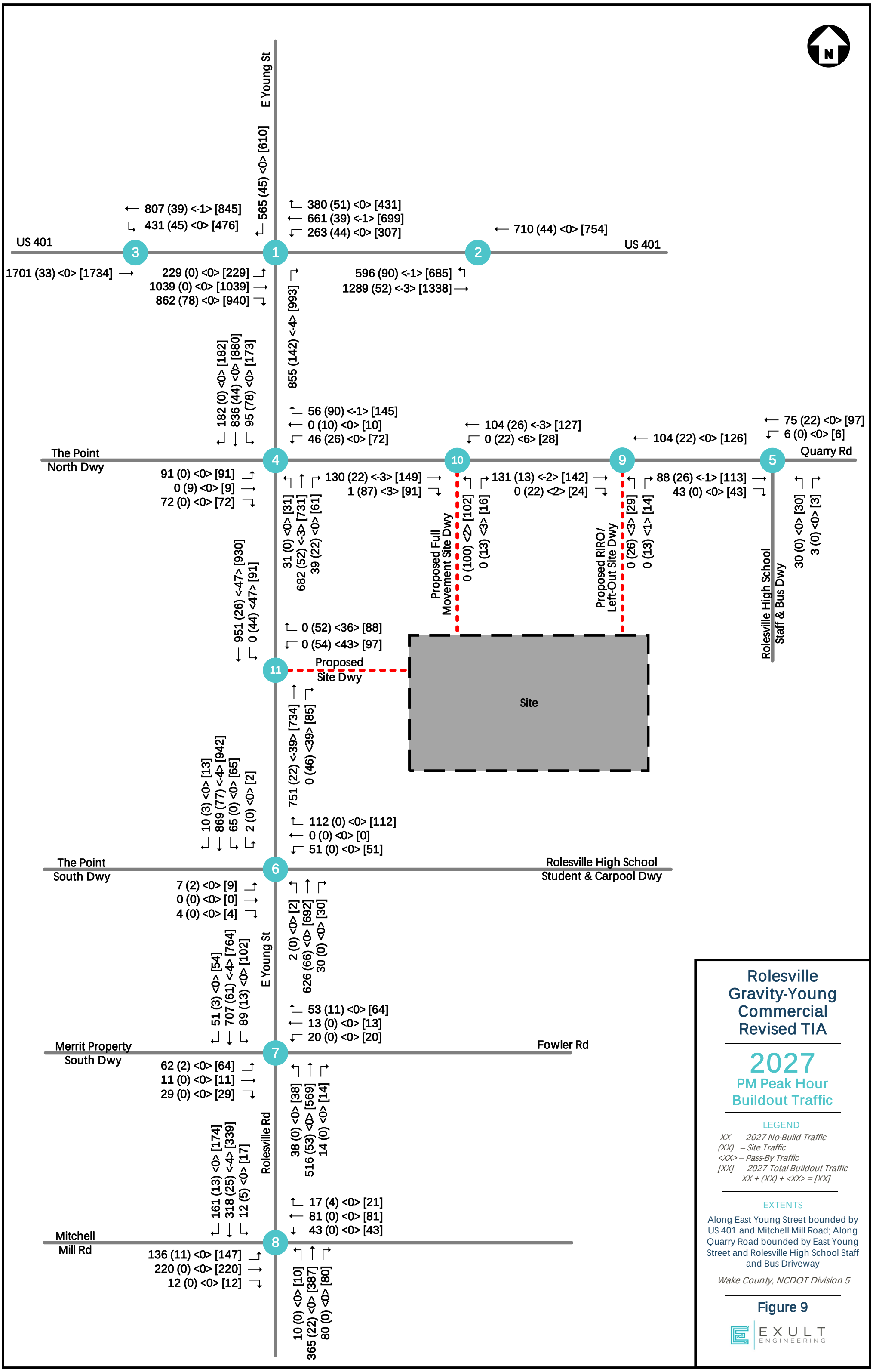

N
E Young St
US 401
US 401
1951 (42) <-1> [1992]
396 (71) <0> [467]
650 (71) <0> [721]
459 (56) <0> [515]
1685 (42) <-1> [1726]
226 (71) <0> [297]
1473 (71) <0> [1544]
892 (53) <0> [945]
120 (0) <0> [120]
294 (0) <0> [294]
879 (124) <0> [1003]
889 (98) <-1> [986]
486 (57) <-1> [542]
1075 (155) <-2> [1228]
91 (0) <0> [91]
803 (71) <0> [874]
204 (124) <0> [328]
146 (99) <-1> [244]
0 (11) <0> [11]
43 (28) <0> [71]
182 (28) <-6> [204]
0 (36) <9> [45]
182 (36) <0> [218]
55 (36) <0> [91]
34 (0) <0> [34]
Quarry Rd
The Point
North Dwy
83 (0) <0> [83]
0 (14) <0> [14]
53 (0) <0> [53]
10 (0) <0> [10]
827 (56) <-1> [882]
79 (36) <0> [115]
283 (36) <-7> [312]
0 (138) <7> [145]
Proposed Full
Movement Site Dwy
0 (110) <5> [115]
0 (14) <7> [21]
283 (14) <-3> [294]
0 (36) <3> [39]
Proposed RIRO/
Left-Out Site Dwy
0 (28) <3> [31]
0 (14) <3> [17]
51 (28) <0> [79]
233 (0) <0> [233]
Rolesville High School
Staff & Bus Dwy
127 (0) <0> [127]
20 (0) <0> [20]
897 (28) <-44> [881]
0 (71) <44> [115]
0 (56) <46> [102]
0 (59) <42> [101]
Proposed
Site Dwy
Site
916 (36) <-47> [905]
0 (75) <47> [122]
5 (3) <0> [8]
569 (84) <-2> [651]
348 (0) <0> [348]
0 (0) <0> [0]
211 (0) <0> [211]
2 (0) <0> [2]
105 (0) <0> [105]
The Point
South Dwy
Rolesville High School
Student & Carpool Dwy
7 (4) <0> [11]
0 (0) <0> [0]
4 (0) <0> [4]
3 (0) <0> [3]
665 (107) <0> [772]
215 (0) <0> [215]
19 (3) <0> [22]
580 (67) <-2> [645]
61 (14) <0> [75]
143 (18) <0> [161]
7 (0) <0> [7]
9 (0) <0> [9]
Merrit Property
South Dwy
Fowler Rd
39 (4) <0> [43]
9 (0) <0> [9]
13 (0) <0> [13]
13 (0) <0> [13]
665 (85) <0> [750]
21 (0) <0> [21]
212 (14) <0> [226]
423 (28) <-2> [449]
12 (6) <0> [18]
20 (7) <0> [27]
276 (0) <0> [276]
115 (0) <0> [115]
Mitchell
Mill Rd
127 (18) <0> [145]
49 (0) <0> [49]
2 (0) <0> [2]
8 (0) <0> [8]
278 (35) <0> [313]
24 (0) <0> [24]
Rolesville
Gravity-Young
Commercial
Revised TIA
2027
AM Peak Hour
Buildout Traffic
LEGEND
XX – 2027 No-Build Traffic
(XX) – Site Traffic
<XX> – Pass-By Traffic
[XX] – 2027 Total Buildout Traffic
XX + (XX) + <XX> = [XX]
EXTENTS
Along East Young Street bounded by US 401 and Mitchell Mill Road; Along Quarry Road bounded by East Young Street and Rolesville High School Staff and Bus Driveway
Wake County, NCDOT Division 5
Figure 8
EXULT
ENGINEERING



Rolesville Gravity-Young Commercial Revised TIA

2027 PM Peak Hour Buildout Traffic

LEGEND

XX – 2027 No-Build Traffic
(XX) – Site Traffic
<XX> – Pass-By Traffic
[XX] – 2027 Total Buildout Traffic
XX + (XX) + <XX> = [XX]

EXTENTS

Along East Young Street bounded by US 401 and Mitchell Mill Road; Along Quarry Road bounded by East Young Street and Rolesville High School Staff and Bus Driveway

Wake County, NCDOT Division 5

Figure 9

EXULT ENGINEERING

CAPACITY ANALYSIS

The intersections identified within the study area were analyzed under 2025 existing, 2027 no-build, and 2027 buildout conditions to identify the potential traffic impact of the proposed development on the roadway network. Necessary roadway improvements to mitigate the anticipated impact of the proposed site traffic were recommended based on the level-of-service (LOS) analysis results.

This study includes analysis of the following traffic scenarios:

- Existing (2025) Traffic Conditions
- No-Build (2027) Traffic Conditions
- Buildout (2027) Traffic Conditions
- Buildout (2027) Traffic Conditions with Recommended Improvements

Analysis of the following additional scenario was performed to provide more information and discussion related to the site traffic and improvements:

- Buildout (2027) Traffic Conditions with Recommended Improvements and Diversion

The additional scenario includes diverting a portion of the exiting left-turn site traffic from the Proposed Full Movement Site Driveway at East Young Street to the Proposed Full Movement Site Driveway at Quarry Road. The site traffic assumed to divert was the volume required to achieve moderate delays for the westbound left-turn movement at the Proposed Full Movement Site Driveway and East Young Street intersection during the AM and PM peak hour with recommended improvements in place. This scenario shows there is sufficient capacity between the site driveways to accommodate exiting site traffic.

LOS is a qualitative measurement of traffic operations that is a measure of delay time. The Transportation Research Board's *Highway Capacity Manual* (HCM) defines six levels of service for intersections with LOS "A" representing the best operating condition and LOS "F" representing the worst. The following table summarizes the criteria for signalized intersections and stop-controlled intersections.

Table 2: Highway Capacity Manual (LOS and Delay)

Signalized Intersection		Stop-Controlled Intersection	
Level-of-Service (LOS)	Average Control Delay (Seconds per Vehicles)	Level-of-Service (LOS)	Average Control Delay (Seconds per Vehicle)
A	≤ 10.0	A	≤ 10.0
B	> 10.0 and ≤ 20.0	B	> 10.0 and ≤ 15.0
C	> 20.0 and ≤ 35.0	C	> 15.0 and ≤ 25.0
D	> 35.0 and ≤ 55.0	D	> 25.0 and ≤ 35.0
E	> 55.0 and ≤ 80.0	E	> 35.0 and ≤ 50.0
F	> 80.0	F	> 50.0

Version 11.1 of Synchro Professional software was used to determine the LOS, delay, and expected queue length at the signalized and unsignalized intersections. SimTraffic was also used to determine the maximum queue length experienced at the study intersections. This software is based on the analysis procedures defined in the HCM. For unsignalized intersections, Synchro reports were created using the HCM 6th Edition option for unsignalized intersections. Queue lengths for the turn lanes are shown in the summary tables. Detailed Synchro and SimTraffic reports are included in the Appendix of this report.

LOS for a two-way stop-controlled (TWSC) intersection is determined by the control delay and is defined for the minor approaches. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. With respect to field measurements, this summation of control delay is defined as the total time elapsed from the time a vehicle stops at the end of the queue to the time the vehicle departs from the stop line. Capacity analysis results between LOS A and LOS C for the minor street stop-controlled approaches are assumed to represent short delays. Results between LOS D and LOS E for the minor street stop-controlled approaches are assumed to represent moderate delays, and LOS F for the minor street stop-controlled approaches is assumed to represent long delays. It is typical for minor street stop-controlled approaches and driveways intersecting major streets to experience long delays during peak hours, particularly for left-turn movements. However, the majority of the traffic moving through the intersection experiences little or no delay on the major street approaches.

Capacity Analysis Inputs

The following inputs were used at study intersections in accordance with the latest *NCDOT Congestion Management Guidelines*:

- In general, Peak Hour Factor (PHF) was based on existing count data by intersection for existing scenarios, where available.* For no-build and buildout scenarios, a PHF of 0.90 was used. For all scenarios, the PHF for any movements going to/from the school driveways was coded as 0.50 per Municipal School Transportation Assistance (MSTA) guidelines during the AM peak hour only since the school's PM peak hour is not expected to overlap with the PM peak hour of the adjacent street traffic or the proposed site traffic.
- For existing scenarios, heavy vehicle percentages (HV%) were based on existing count data by approach, where available,* and set to a minimum of 2%. For no-build and buildout scenarios, a default HV% of 2% was used except for the turning movements at Quarry Road and Rolesville High School Bus & Staff Driveway, where the HV% from the existing count data was used.
- For allowable movements where zero (0), one (1), two (2), or three (3) volumes are projected, a value of four (4) was used in the Synchro capacity analysis model.
- Enter Blocked Intersection was set to 1 vehicle for all stop-controlled approaches.
- Right-turns on red were not permitted at signalized intersections.
- Total lost time was set to 5 seconds, yellow time was set to 5 seconds, and red time was set to 2 seconds at signalized intersections for all future scenarios.

**Note: PHF and HV% for intersections along US 401 were manually calculated based on the 13-hour count data obtained from the signal re-timing project performed by Exult Engineering for The Point after identifying the AM and PM peak hour volume periods.*

For unsignalized intersections, queue length for HCM from Synchro is given in terms of number of vehicles. To convert to queue length in feet, an estimated 25 feet per vehicle was applied. The recommended storage lengths are typically based on a combination of the Synchro 95% queue, the maximum queue length reported from SimTraffic, or results from the NCDOT *Warrant for Left and Right-Turn Lanes*. The

storage length was not updated in the Synchro settings after running the initial SimTraffic simulation due to varying results that SimTraffic may provide with each iteration.

The following subsections summarize the LOS and queue length results for the capacity analysis under 2025 existing, 2027 no-build, and 2027 buildout traffic scenarios for each study intersection.

According to the guidelines published in NCDOT's *Policy on Street and Driveway Access to North Carolina Highways* (July 2003), mitigation improvements should be identified if the total average delay at an intersection or individual approach increases by 25% or greater.

According to the Town of Rolesville's *Land Development Ordinance* (LDO), mitigation improvements should be identified if the proposed development causes an intersection within the study area to fall below LOS D or, where the existing level of service is already LOS E, the proposed development causes the LOS to fall to the next lower letter grade.

East Young Street at US 401 Bypass

East Young Street at US 401 Bypass is currently a signalized Reduced Conflict Intersection ("RCI"). Based on the *NCDOT Capacity Analysis Guidelines – Best Practices*, this RCI intersection was coded as two separate intersections with each direction of travel having its own node.

South Leg of East Young Street at US 401 Bypass

Existing signal plans obtained from NCDOT were referenced to model the intersection. In addition, as part of a retiming improvement for The Point, Exult Engineering recently performed field implementation of recommended signal timings. These timings were used in the 2025 existing scenario and are included in the Appendix along with the signal plan. Note that the left-turn movements along US 401 were coded with protected only phasing under existing and future conditions, even though protected + permissive phasing exists today. This is because Synchro indicates a conflict when coding the protected + permissive phasing as shown on the signal plans. Protected only phasing is expected to yield conservative results.

For future no-build and buildout scenarios, the cycle length, splits, and offsets were optimized.

The following roadway improvements are committed to by others and were included in the future year no-build and buildout scenarios:

- Extend the eastbound right-turn lane on US 401 to provide 400 feet of full-width storage. (The Point)
- Extend the second northbound right-turn lane on East Young Street to provide 600 feet of full-width storage (Woodlief Assemblage/Broadmoor)
- Convert the eastbound right-turn lane on US 401 to a free-flow right-turn lane. (Merritt Property)
- Construct a second southbound receiving lane on East Young Street that drops at The Point North Driveway. (Merritt Property)

The capacity analysis results for the signalized intersection of Southbound East Young Street at Westbound US 401 Bypass are summarized in Table 3. The capacity analysis results for the signalized intersection of Northbound East Young Street at Eastbound US 401 Bypass are summarized in Table 4.

As shown in Table 3, the intersection of Southbound East Young Street at Westbound US 401 Bypass currently operates at LOS B during the AM peak hour and LOS C during the PM peak hour. The intersection is expected to operate at LOS C during the AM peak hour LOS B during the PM peak hour under both 2027 no-build and 2027 buildout conditions.

According to the guidelines published in NCDOT's *Policy on Street and Driveway Access to North Carolina Highways* (July 2003), mitigation improvements should be identified if the total average delay at an intersection or individual approach increases by 25% or greater. With the addition of site traffic, the overall delay and all approach delays for the southbound intersection are expected to increase by less than 25% when compared to no-build conditions, with the exception of the westbound approach during the PM peak hour. However, the westbound approach delay increases by only 3.8 seconds, and the

approach is still expected to operate at LOS B under buildout conditions. The overall intersection is expected to operate at an acceptable level of service during both peak hours under buildout conditions, satisfying the Town's *Land Development Ordinance* (LDO). Therefore, no roadway improvements are recommended to be completed by the developer.

Table 3: Level-of-Service: Southbound East Young Street at Westbound US 401 Bypass (Signalized)

Condition	AM Peak		PM Peak	
	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)
2025 Existing	Overall – B (18.2) WB – B (11.9) EBL – C (24.4) SBR – D (36.0)	EBL – 101'/140' SBR – 232'/278'	Overall – C (23.5) WB – B (10.3) EBL – D (42.8) SBR – D (37.3)	EBL – 187'/206' SBR – 159'/262'
2027 No-Build	Overall – C (21.9) WB – B (15.1) EBL – C (26.9) SBR – D (43.1)	EBL – 116'/134' SBR – 324'/341'	Overall – B (14.7) WB – A (8.8) EBL – B (18.2) SBR – C (24.1)	EBL – 94'/146' SBR – 176'/306'
2027 Buildout	Overall – C (25.5) WB – B (18.7) EBL – C (28.5) SBR – D (46.4)	EBL – 114'/133' SBR – 371'/360'	Overall – B (17.5) WB – B (12.0) EBL – B (15.4) SBR – C (28.4)	EBL – 67'/165' SBR – 218'/319'

As shown in Table 4, the intersection of Northbound East Young Street at Eastbound US 401 Bypass currently operates at LOS C during the AM peak hour and LOS B during the PM peak hour. The intersection is expected to continue to operate at LOS C during the AM peak hour LOS B during the PM peak hour under both 2027 no-build and 2027 buildout conditions.

With the addition of site traffic, the overall delay and all approach delays for the northbound intersection are expected to operate at an acceptable level of service. With the addition of site traffic, the overall intersection and northbound approach increase by more than 25% during the AM peak hour and the eastbound approach increases by more than 25% during the PM peak hour compared to no-build conditions. However, for all these instances, the increase in delay is 4.4 seconds or less and the LOS under buildout conditions is LOS B. The overall intersection is expected to operate at an acceptable level of service during both peak hours under buildout conditions, which adheres to the Town's *Land Development Ordinance* (LDO). Therefore, no roadway improvements are recommended to be completed by the developer.

Table 4: Level-of-Service: Northbound East Young Street at Eastbound US 401 Bypass (Signalized)

Condition	AM Peak		PM Peak	
	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)
2025 Existing	Overall – C (27.5) EB – B (14.9) NBR – D (49.9) WBL – C (20.6)	NBR – 292'/344' WBL – 87'/146'	Overall – B (16.4) EB – A (6.9) NBR – D (38.1) WBL – C (32.9)	NBR – 189'/211' WBL – 144'/173'
2027 No-Build	Overall – A (8.8) EB – A (9.4) NBR – A (8.3) WBL – A (7.7)	NBR – 109'/367' WBL – 55'/155'	Overall – B (13.0) EB – A (7.1) NBR – C (25.8) WBL – B (14.1)	NBR – 281'/271' WBL – 129'/196'
2027 Buildout	Overall – B (11.2) EB – B (11.1) NBR – B (12.7) WBL – A (5.0)	NBR – 306'/394' WBL – 59'/207'	Overall – B (15.4) EB – B (10.1) NBR – C (27.0) WBL – B (12.8)	NBR – 417'/245' WBL – 187'/213'

US 401 Bypass at U-Turn North (East) of East Young Street

US 401 Bypass at U-Turn North (East) of East Young Street is currently a signalized U-turn intersection that is part of the Reduced Conflict Intersection. Existing signal plans obtained from NCDOT were referenced to model the intersection. In addition, as part of a retiming improvement for The Point, Exult Engineering recently performed field implementation of recommended signal timings. These timings were used in the 2025 existing scenario and are included in the Appendix along with the signal plan. Note that the U-turn movement along US 401 was coded with protected only phasing under existing and future conditions, even though protected + permissive phasing exists today. This is because Synchro indicates a conflict when coding the protected + permissive phasing as shown on the signal plans. Protected only phasing is expected to result in a conservative analysis.

Westbound Approach of US 401 Bypass at U-turn North of East Young Street

For future no-build and buildout scenarios, the cycle length, splits, and offsets were optimized.

The following roadway improvement is committed to by others and was included in the future year no-build and buildout scenarios:

- Construct a second eastbound U-turn lane with 400 feet of full-width storage. (Woodlief/ Broadmoor)

The capacity analysis results for the signalized intersection are summarized in Table 5 below.

The intersection of US 401 Bypass at U-Turn North (East) of East Young Street currently operates at LOS C during the AM peak hour and LOS B during the PM peak hour. Under both 2027 no-build and 2027 buildout conditions, the intersection is expected to continue to operate at LOS C during the AM peak hour and LOS B during the PM peak hour.

Table 5: Level-of-Service: US 401 Bypass at U-Turn North (East) of East Young Street (Signalized)

Condition	AM Peak		PM Peak	
	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)
2025 Existing	Overall – C (27.6) WB – C (26.5) EBU – C (30.4)	EBU – 391'/551'	Overall – B (18.1) WB – A (8.2) EBU – D (36.4)	EBU – 212'/325'
2027 No-Build	Overall – C (25.0) WB – C (21.5) EBU – C (30.8)	EBU – 346'/369'	Overall – B (15.5) WB – B (10.3) EBU – C (21.7)	EBU – 148'/251'
2027 Buildout	Overall – C (29.8) WB – C (26.6) EBU – C (34.8)	EBU – 431'/349'	Overall – B (19.6) WB – B (12.8) EBU – C (27.1)	EBU – 223'/254'

The intersection is expected to operate at an acceptable level of service during both peak hours under buildout conditions, which adheres to the Town's *Land Development Ordinance* (LDO). According to the guidelines published in NCDOT's *Policy on Street and Driveway Access to North Carolina Highways* (July 2003), mitigation improvements should be identified if the total average delay at an intersection or individual approach increases by 25% or greater. Although the projected delay for the overall intersection is expected to increase by 26% (slightly over the allowable threshold) during the PM peak hour when compared to 2027 no-build conditions, this represents a minimal increase of 4.1 seconds of delay, and the intersection is expected to operate at LOS B during the PM peak hour. Therefore, no roadway improvements are recommended to be completed by the developer to accommodate site traffic.

US 401 Bypass at U-Turn South (West) of East Young Street

US 401 Bypass at U-Turn South (West) of East Young Street is currently a signalized U-turn intersection that is part of the Reduced Conflict Intersection. Existing signal plans obtained from NCDOT were referenced to model the intersection. In addition, as part of a retiming improvement for The Point, Exult Engineering recently performed field implementation of recommended signal timings. These timings were used in the 2025 existing scenario and are included in the Appendix along with the signal plan. Note that the U-turn movement along US 401 was coded with protected only phasing under existing and future conditions, even though protected + permissive phasing exists today. This is because Synchro indicates a conflict when coding the protected + permissive phasing as shown on the signal plans. Protected only phasing is expected to result in a conservative analysis.

Westbound Approach of US 401 Bypass at U-turn

For future no-build and buildout scenarios, the cycle length, splits, and offsets were optimized.

The capacity analysis results for the signalized intersection are summarized in Table 6 below.

The intersection of US 401 Bypass at U-Turn South (West) of East Young Street currently operates at LOS B during the AM and PM peak hours. Under both 2027 no-build and 2027 buildout conditions, the intersection is expected to operate at LOS B during the AM peak hour and LOS C during the PM peak hour.

Table 6: Level-of-Service: US 401 Bypass at U-Turn South (West) of East Young Street (Signalized)

Condition	AM Peak		PM Peak	
	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)
2025 Existing	Overall – B (17.2) EB – A (10.0) WBU – C (33.4)	WBU – 233'/375'	Overall – B (17.5) EB – B (10.0) WBU – D (52.5)	WBU – 247'/334'
2027 No-Build	Overall – B (17.4) EB – B (14.5) WBU – C (23.9)	WBU – 195'/402'	Overall – C (30.4) EB – C (25.3) WBU – D (50.2)	WBU – 371'/484'
2027 Buildout	Overall – B (19.3) EB – B (17.9) WBU – C (22.2)	WBU – 226'/456'	Overall – D (35.1) EB – C (29.6) WBU – D (54.9)	WBU – 482'/556'

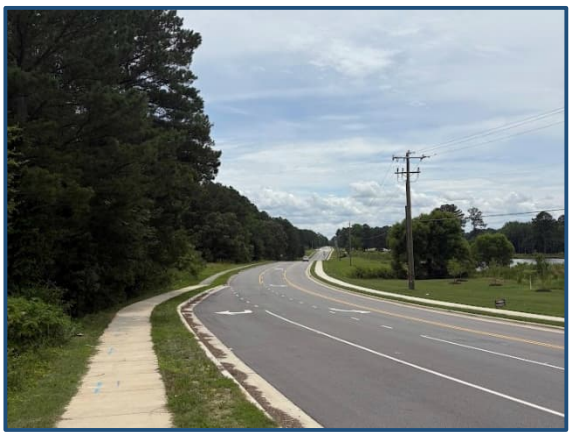
According to the guidelines published in NCDOT's *Policy on Street and Driveway Access to North Carolina Highways* (July 2003), mitigation improvements should be identified if the total average delay at an intersection or individual approach increases by 25% or greater. With the addition of the proposed site,

the projected delay for the intersection and all approaches is expected to increase by less than 25% when compared to 2027 no-build conditions. Although the overall LOS is projected to degrade to a LOS D under 2027 buildout conditions during the PM peak hour, the threshold for LOS C is 35.0 seconds or less, making this a LOS D by only 0.1 second. Furthermore, site traffic is projected to increase the overall intersection delay by 4.7 seconds when compared to no-build conditions. Therefore, because the intersection is expected to operate at an acceptable LOS under buildout conditions during both peak hours and the site impact is minimal (15% or less to the overall intersection delay), no roadway improvements are recommended to be completed by the developer to accommodate site traffic.

East Young Street at Quarry Road/The Point North Driveway

East Young Street at Quarry Road/The Point North Driveway is currently a four-legged unsignalized intersection. The eastbound and westbound minor street approaches (The Point North Driveway and Quarry Road, respectively) operate under stop control while the major street northbound and southbound approaches (East Young Street) are free- flow.

The capacity analysis results for the intersection are summarized in Table 7. The intersection currently operates with long delays on the eastbound minor street approach (The Point North Driveway) and westbound minor street approach (Quarry Road) during the AM peak hour and short delays on both approaches during the PM peak hour.



South Leg of East Young Street at Quarry Road/The Point North Driveway

The following roadway improvements are committed to by others and were not yet constructed and therefore, were included in the future year no-build and buildout scenarios:

- Install a traffic signal. (The Point)
- Extend the southbound right-turn lane on East Young Street to provide continuous storage to US 401 Bypass. (Merritt Property)

Under 2027 no-build conditions, the intersection is expected to operate at LOS B during the AM and PM peak hours. Under 2027 buildout conditions, the intersection is expected to operate at LOS C during the AM peak hour and LOS B during the PM peak hour.

An additional scenario was considered that affects operations at this intersection. Given the long delays expected on the westbound minor street approach of the Proposed Full Movement Site Driveway at East Young Street intersection and available capacity at other site driveways, it is reasonable to expect site traffic would divert to a site driveway with less delay. Therefore, an additional scenario was considered that includes diverting a portion of the exiting left-turn site traffic from the Proposed Full Movement Site Driveway at East Young Street to the Proposed Full Movement Site Driveway at Quarry Road.

According to the guidelines published in NCDOT's *Policy on Street and Driveway Access to North Carolina Highways* (July 2003), mitigation improvements should be identified if the total average delay at an intersection or individual approach increases by 25% or greater. The projected delay for the intersection increases by more than 25% when comparing buildout to no-build conditions during both the AM and PM peak hour. Therefore, the following improvements are recommended to be constructed by the developer to accommodate site traffic (with or without the site trip diversion):

- Construct a second northbound through lane on East Young Street with 300 feet of storage and appropriate taper and the associated northbound receiving lane to tie into the second northbound right-turn lane at US 401.
- Restripe the eastbound approach of The Point North Driveway to consist of a shared through/left-turn lane and an exclusive right-turn lane.

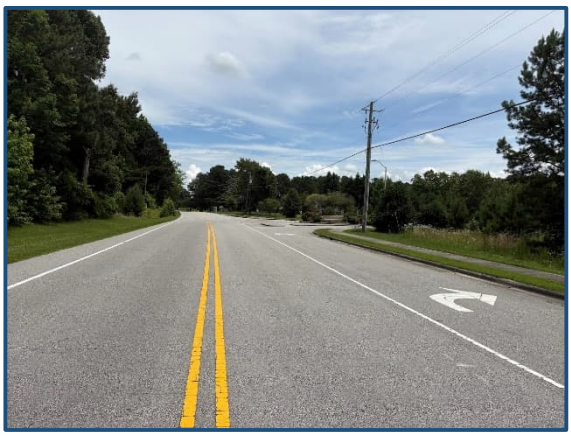
As shown in Table 7, this intersection is expected to operate at LOS C during the AM peak hour and LOS B during the PM peak hour with the recommended improvements in place with or without the site trip diversion. All approach levels of service under buildout conditions with recommended improvements in place are either considered acceptable or do not degrade from no-build conditions.

Table 7: Level-of-Service: East Young Street at Quarry Road/The Point North Driveway (Unsignalized & Signalized)

Condition	AM Peak		PM Peak	
	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)
2025 Existing	NBL – A (9.5) EB – F (96.5) EBL – F (241.0) EBT/R – E (43.9) WB – F (83.9) WBL/T – F (381.3) WBR – C (15.9) SBL – B (10.2)	NBL – 0'/20' NBR – -'/12' EBL – 20'/26' WBR – 40'/100' SBL – 28'/100' SBR – -'/-'	NBL – A (8.2) EB – C (20.6) EBL – D (29.2) EBT/R – B (14.3) WB – B (14.1) WBL/T – D (25.5) WBR – B (11.3) SBL – A (8.6)	NBL – 0'/12' NBR – -'/3' EBL – 5'/40' WBR – 8'/34' SBL – 8'/61' SBR – -'/-'
2027 No-Build	Overall – B (17.2) EB – E (57.9) WB – C (33.5) NB – B (14.4) SB – B (11.5)	NBL – 2'/104' NBR – 17'/248' EBL – 126'/164' WBR – 122'/142 SBL – 240'/348' SBR – 10'/123'	Overall – B (14.6) EB – D (47.9) WB – C (32.6) NB – B (10.3) SB – B (10.7)	NBL – 13'/67' NBR – 13'/124' EBL – 114'/152' WBR – 56'/80' SBL – 111'/143' SBR – 44'/134'
2027 Buildout	Overall – C (30.9) EB – F (101.5) WB – D (52.2) NB – C (23.5) SB – C (23.2)	NBL – 3'/26' NBR – 35'/193' EBL – 178'/350' WBR – 247'/255' SBL – 456'/606' SBR – 19'/816'	Overall – B (20.0) EB – E (58.0) WB – D (39.2) NB – B (16.5) SB – B (13.4)	NBL – 11'/121' NBR – 17'/182' EBL – 135'/154' WBR – 121'/146' SBL – 179'/417' SBR – 58'/505'
2027 Buildout with Improvements	Overall – C (23.6) EB – E (60.1) WB – C (33.5) NB – B (19.9) SB – B (19.8)	NBL – 5'/56' NBR – 57'/112' EBL/T – 141'/183' WBR – 175'/241' SBL – 345'/502' SBR – 31'/597'	Overall – B (15.4) EB – D (45.7) WB – C (28.4) NB – B (12.0) SB – B (11.1)	NBL – 18'/100' NBR – 24'/79' EBL/T – 113'/134' WBR – 101'/152' SBL – 149'/299' SBR – 40'/301'
2027 Buildout with Improvements and Diversion	Overall – C (25.6) EB – D (54.7) WB – D (36.7) NB – C (21.5) SB – C (22.2)	NBL – 6'/72' NBR – 60'/180' EBL/T – 138'/174' WBR – 155'/231' SBL – 345'/513' SBR – 39'/675'	Overall – B (16.3) EB – D (44.6) WB – C (30.9) NB – B (12.6) SB – B (11.8)	NBL – 19'/83' NBR – 26'/80' EBL/T – 113'/134' WBR – 99'/141' SBL – 157'/227' SBR – 48'/176'

Quarry Road at Rolesville High School Staff & Bus Driveway

Quarry Road at Rolesville High School Staff & Bus Driveway is currently a three-legged unsignalized intersection. The northbound minor street approach (Rolesville High School Staff & Bus Driveway) operates under stop control while the major street eastbound and westbound approaches (Quarry Road) are free-flow.



Eastbound Approach of Quarry Road at RHS Staff & Bus Driveway

The capacity analysis results for the intersection are summarized in Table 8. The intersection currently operates with short delays on the northbound minor street approach (Rolesville High School Staff & Bus Driveway) during both the AM and PM peak hours.

Under 2027 no-build and 2027 buildout conditions, the intersection is expected to continue to operate with short delays for the northbound minor street approach during the AM and PM peak hours.

According to the guidelines published in NCDOT's *Policy on Street and Driveway Access to North Carolina Highways* (July 2003), mitigation improvements should be identified if the total average delay at an intersection or individual approach increases by 25% or greater. The projected delay for the intersection increases by less than 25% when comparing buildout to no-build conditions. The intersection is expected to operate at an acceptable level of service during both peak hours, which adheres to the Town's *Land Development Ordinance* (LDO). Therefore, there are no improvements recommended to be completed by the developer to accommodate site traffic.

Table 8: Level-of-Service: Quarry Road at Rolesville High School Staff & Bus Driveway (Unsignalized)

Condition	AM Peak		PM Peak	
	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)
2025 Existing	NB – B (11.4) NBL – B (11.9) NBR – A (9.0) WBL – A (8.2)	EBR – - '/6'	NB – A (9.4) NBL – A (9.5) NBR – A (8.8) WBL – A (7.6)	EBR – - '/-'
2027 No-Build	NB – B (13.5) NBL – B (14.2) NBR – A (9.1) WBL – A (8.8)	EBR – - '/ -'	NB – A (9.7) NBL – A (9.8) NBR – A (8.8) WBL – A (7.5)	EBR – - '/-'
2027 Buildout	NB – C (15.0) NBL – C (15.9) NBR – A (9.3) WBL – A (8.9)	EBR – -'/-'	NB – B (10.0) NBL – B (10.1) NBR – A (8.9) WBL – A (7.6)	EBR – -'/-'

East Young Street at Rolesville High School Student & Carpool Driveway/The Point South Driveway

East Young Street at Rolesville High School Student & Carpool/The Point South Driveway is currently a four-legged unsignalized intersection. The eastbound and westbound minor street approaches (The Point South Driveway and Rolesville High School Student & Carpool Driveway, respectively) operate under stop control while the major street northbound and southbound approaches (East Young Street) are free- flow.

It is important to note that one southbound U-turn vehicle was observed at the intersection. However, because Synchro will not report delays for free-flow U-turns, this volume was instead added to the southbound left-turn volume and the corresponding westbound right-turn volume in Synchro.

NB Approach of East Young Street at RHS Student & Carpool/The Point South Driveway

The capacity analysis results for the intersection are summarized in Table 9. The intersection currently operates with long delays on the eastbound minor street approach (The Point South Driveway) and westbound minor street approach (Rolesville High School Student & Carpool Driveway) during the AM peak hour and short delays on both minor street approaches during the PM peak hour.

The following roadway improvements are committed to by others and were not yet constructed and therefore, were included in the future year no-build and buildout scenarios:

- Monitor for signalization and install traffic signal, if warranted. (Woodlief Assemblage/ Broadmoor)

A signal warrant analysis was performed to determine if and when the committed traffic signal would be installed. Based on the Federal Highway Administration *Manual on Uniform Traffic Control Devices* (11th Edition), the projected 2027 no-build traffic volumes at this intersection are expected to meet the Peak-Hour Vehicular Volume signal warrant and the Four-Hour Vehicular Volume signal warrant. Therefore, a traffic signal was assumed to be in place under both no-build and buildout conditions. To appropriately project approved development traffic volumes for the 6:30am – 7:30am, 7:30am – 8:30am, and 8:30am – 9:30am hours in which the existing count data was collected, the hourly ITE Time-of-Day distributions for the half hour increments were applied. For approved developments with shopping center uses where the ITE half hour TOD distribution percentages are not available, the hour distributions for the three AM peak hours were assumed to be 0%, to be conservative.

The posted regulatory speed limit on Rolesville Road is 45 miles per hour; therefore, the signal warrant was evaluated with the 70% threshold. However, even if the 100% threshold is considered when the school speed limit of 35 miles per hour is enforced, the projected AM traffic volumes are still expected to meet the warrants. Signal warrant information is included in the Appendix of this report.

Under both 2027 no-build and 2027 buildout conditions, the intersection is expected to operate at LOS E during the AM peak hour and LOS B during the PM peak hour.

According to the guidelines published in NCDOT's *Policy on Street and Driveway Access to North Carolina Highways* (July 2003), mitigation improvements should be identified if the total average delay at an intersection or individual approach increases by 25% or greater. The projected delay for the intersection increases by 11% when comparing buildout to no-build conditions during both the AM and PM peak hours. Although the eastbound approach delay is expected to increase by more than 25% during the AM peak hour, the westbound approach delay is expected to decrease. Furthermore, the eastbound LOS remains at an acceptable LOS D and the westbound approach LOS is expected to improve under buildout conditions. The intersection is expected to maintain the same LOS under buildout conditions as no-build conditions during both peak hours, which adheres to the Town's *Land Development Ordinance* (LDO). Therefore, there are no improvements recommended to be completed by the developer to accommodate site traffic.

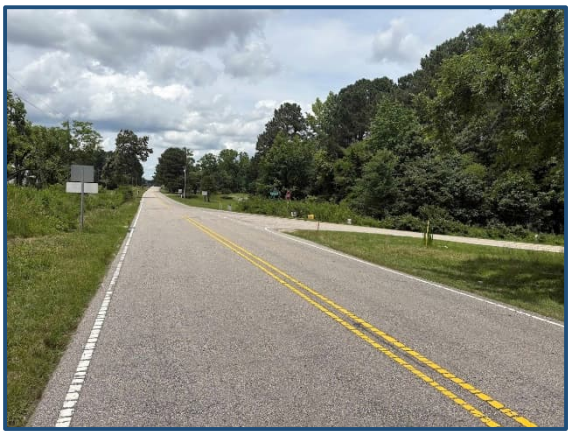
Table 9: Level-of-Service: East Young Street at Rolesville High School Student & Carpool Driveway/The Point South Driveway (Unsignalized & Signalized)

Condition	AM Peak		PM Peak	
	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)
2025 Existing	NBL – A (8.1) EBL/T/R – F (381.0) WB – F (1159.5) WBL/T – F (3078.3) WBR – B (13.6) SBL – B (10.6)	NBL – 0'/10' NBR – - '/-' WBR – 58'/124' SBL – 70'/92'	NBL – A (8.2) EBL/T/R – C (18.8) WB – C (15.6) WBL/T – D (25.0) WBR – B (11.3) SBL – A (8.2)	NBL – 0'/15' NBR – - '/-' WBR – 18'/89' SBL – 5'/40'
2027 No-Build (Signalized)	Overall – E (67.4) EB – D (41.1) WB – F (87.0) NB – E (56.6) SB – E (68.0)	NBL – 3'/92' NBR – 109'/410' WBR – 105'/202' SBL – 267'/313'	Overall – B (11.0) EB – D (38.3) WB – D (35.5) NB – A (8.9) SB – A (7.7)	NBL – 2'/40' NBR – 14'/-' WBR – 107'/174' SBL – 69'/107'
2027 Buildout (Signalized)	Overall – E (74.8) EB – D (52.5) WB – E (79.8) NB – E (68.0) SB – E (79.1)	NBL – 5'/92' NBR – 177'/410' WBR – 144'/230' SBL – 315'/312'	Overall – B (12.2) EB – D (38.4) WB – D (35.5) NB – A (9.7) SB – A (9.7)	NBL – 2'/42' NBR – 12'/41' WBR – 104'/160' SBL – 62'/105'

**Movement Delay obtained from HCM 2000 Report*

Rolesville Road at Fowler Road/Merritt Property Southern Driveway

Rolesville Road at Fowler Road/Merritt Property Southern Driveway is currently a three-legged unsignalized intersection. The westbound minor street approach (Fowler Road) operates under stop control while the major street northbound and southbound approaches (Rolesville Road) are free-flow.



Northbound Approach of Rolesville Road at Fowler Road

The capacity analysis results for the intersection are summarized in Table 10. The intersection currently operates with short delays on the westbound minor street approach (Fowler Road) during both the AM and PM peak hours.

The following roadway improvements are committed to by the Merritt Property and were included in the future year no-build and buildout scenarios:

- Construct the Merritt Property Southern Driveway/Fowler Road Extension as the west leg of the intersection and provide one ingress and egress lane.
- Construct a southbound right-turn lane on Rolesville Road with 100 feet of full-width storage.
- Construct a southbound left-turn lane on Rolesville Road with 100 feet of full-width storage.
- Construct a northbound left-turn lane on Rolesville Road with 100 feet of full-width storage.
- Monitor for signalization and install traffic signal, if warranted.

A signal warrant analysis was performed to determine if and when the committed traffic signal would be installed. Based on the Federal Highway Administration *Manual on Uniform Traffic Control Devices* (11th Edition), the projected 2027 no-build traffic volumes at this intersection are expected to meet the Peak-Hour Vehicular Volume signal warrant and the Four-Hour Vehicular Volume signal warrant. Therefore, the signal was assumed to be in place under both 2027 no-build and 2027 buildout conditions. Signal warrant information is included in the Appendix of this report.

Under both 2027 no-build and 2027 buildout conditions with all the committed improvements in place, the intersection is expected to operate at LOS B during the AM peak hour and LOS A during the PM peak hour.

According to the guidelines published in NCDOT's *Policy on Street and Driveway Access to North Carolina Highways* (July 2003), mitigation improvements should be identified if the total average delay at an intersection or individual approach increases by 25% or greater. The projected delay for the intersection increases by less than 25% when comparing buildout to no-build conditions during both the AM and PM peak hour. Additionally, the intersection is expected to operate at an acceptable level of service during both peak hours, which adheres to the Town's *Land Development Ordinance* (LDO). Therefore, there are no improvements recommended to be completed by the developer to accommodate site traffic.

Table 10: Level-of-Service: Rolesville Road at Fowler Road/Merritt Property Southern Driveway (Unsignalized & Signalized)

Condition	AM Peak		PM Peak	
	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)
2025 Existing	WB – B (12.2) SBL/T – A (8.2)	No Turn Lanes	WB – B (11.1) SBL/T – A (8.2)	No Turn Lanes
2027 No-Build (Signalized)	Overall – B (11.7) EB – D (35.7) WB – D (42.1) NB – A (9.4) SB – A (4.6)	NBL – 9'/49' SBL – 15'/109' SBR – 4'/72'	Overall – A (9.1) EB – D (45.1) WB – D (39.2) NB – A (5.5) SB – A (4.2)	NBL – 17'/52' SBL – 18'/107' SBR – 10'/125'
2027 Buildout (Signalized)	Overall – B (15.1) EB – D (49.2) WB – D (54.9) NB – B (11.7) SB – A (6.2)	NBL – 11'/146' SBL – 31'/178' SBR – 7'/102'	Overall – A (10.0) EB – D (45.3) WB – D (39.4) NB – A (6.2) SB – A (5.5)	NBL – 18'/84' SBL – 28'/147' SBR – 14'/128'

Rolesville Road at Mitchell Mill Road

Rolesville Road at Mitchell Mill Road is currently a four-legged, unsignalized intersection. The intersection operates under all-way stop control.

The capacity analysis results for the intersection are summarized in Table 11. The intersection currently operates with short delays on all approaches during both the AM and PM peak hours.

Westbound Approach of Mitchell Mill Road at Rolesville Road

The following roadway improvement is committed to by others and was included in the future year no-build and buildout scenarios:

- Install a traffic signal. (multiple developer agreement)

A signal warrant analysis was performed to determine if and when the committed traffic signal would be installed. Based on the Federal Highway Administration *Manual on Uniform Traffic Control Devices* (11th Edition), the projected 2027 no-build traffic volumes at this intersection are expected to meet the Peak-Hour Vehicular Volume signal warrant and the Four-Hour Vehicular Volume signal warrant. Therefore, the signal was assumed to be in place under both no-build and buildout conditions. Signal warrant information is included in the Appendix of this report.

Under both 2027 no-build and 2027 buildout conditions with the committed improvement in place, the intersection is expected to operate at LOS C during the AM peak hour and LOS B during the PM peak hour.

According to the guidelines published in NCDOT's *Policy on Street and Driveway Access to North Carolina Highways* (July 2003), mitigation improvements should be identified if the total average delay at an intersection or individual approach increases by 25% or greater. The projected overall delay for the intersection increases by less than 25% when comparing buildout to no-build conditions during both the AM and PM peak hour. While the southbound approach delay increases by more than 25% in the AM peak hour, the westbound approach delay decreases when comparing buildout conditions to no-build conditions. Furthermore, all approaches are expected to operate at an acceptable LOS D or better. The overall LOS degrades from a LOS B to LOS C during the PM peak hour, but the delay yielding this difference in LOS is only 1.4 seconds. The intersection is expected to operate at an acceptable level of service during both peak hours, which adheres to the Town's *Land Development Ordinance* (LDO). Therefore, there are no improvements recommended to be completed by the developer to accommodate site traffic.

Table 11: Level-of-Service: Rolesville Road at Mitchell Mill Road (Unsignalized & Signalized)

Condition	AM Peak		PM Peak	
	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)
2025 Existing	EBL/T/R – B (13.4) WB – C (25.0) WBL/T – D (25.8) WBR – A (9.3) NBL/T/R – C (16.1) SBL/T/R – C (21.8)	WBR – 3'/281'	EBL/T/R – B (13.7) WB – B (11.3) WBL/T – B (11.5) WBR – A (8.9) NBL/T/R – B (14.4) SBL/T/R – B (13.7)	WBR – 0'/19'
2027 No-Build (Signalized)	Overall – C (27.2) EB – D (48.0) WB – C (28.1) NB – B (12.6) SB – C (28.0)	WBR – 18'/35'	Overall – B (19.3) EB – C (23.4) WB – B (13.5) NB – B (17.4) SB – B (19.8)	WBR – 15'/44'
2027 Buildout (Signalized)	Overall – C (32.0) EB – D (53.9) WB – C (26.2) NB – B (15.3) SB – D (37.6)	WBR – 23'/54'	Overall – C (20.7) EB – C (27.4) WB – B (14.4) NB – B (17.1) SB – C (21.0)	WBR – 18'/41'

Quarry Road at Proposed Right-In/Right-Out/Left-Out Site Driveway

The future intersection of Quarry Road at Proposed Right-In/Right-Out/Left-Out Site Driveway is a proposed unsignalized, three-legged intersection. The northbound minor street approach (Proposed Right-In/Right-Out/Left-Out Site Driveway) is proposed to operate under stop control while the eastbound and westbound major street approaches (Quarry Road) will operate as free-flow.

Eastbound Quarry Road at Proposed Right-In/Right-Out/Left-Out Site Driveway Location

Based on a preliminary site visit, it appears adequate sight distance is provided at the approximate Proposed Right-In/Right-Out/Left-Out Site Driveway location.

The capacity analysis results for the intersection are summarized in Table 12 below. The intersection is expected to operate with short delays during the AM and PM peak hours for the northbound minor street approach (Proposed Right-In/Right-Out/Left-Out Site Driveway) at project buildout.

Table 12: Level-of-Service: Quarry Road at Proposed Right-In/Right-Out/Left-Out Site Driveway (Unsignalized)

Condition	AM Peak		PM Peak	
	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)
2027 Buildout	NBL/R – B (12.5)	No Turn Lanes	NBL/R – B (10.3)	No Turn Lanes
2027 Buildout with Improvements	NBL/R – B (12.3)	EBR – -'/-'	NBL/R – B (10.2)	EBR – -'/-'

According to guidelines published in the NCDOT's *Policy On Street And Driveway Access to North Carolina Highways* (July 2003), turn lanes should be considered when the average daily traffic meets or exceeds 4,000 vehicles per day (existing plus proposed development site traffic). The projected 2027 daily traffic volume at buildout on Quarry Road at the Proposed Right-In/Right-Out/Left-Out Site Driveway is projected to be approximately 3,000 vehicles per day. Given the projected ADT on Quarry Road is expected to be below 4,000 vehicles per day. However, based on NCDOT's review of the *Rolesville Gravity-Young Street Commercial Traffic Impact Analysis* (September 2025), turn lane improvements were considered at this intersection.

The following roadway improvements are recommended to be constructed by the developer to accommodate site traffic:

- Construct an exclusive eastbound right-turn lane on Quarry Road with 50 feet of storage and appropriate taper.

- Provide one ingress and one egress lane on the south leg of Proposed Right-In/Right-Out/Left-Out Site Driveway.

The westbound left-turn movement from Quarry Road will be restricted with a porkchop island similar to the conceptual design below:

Quarry Road at Proposed Full Movement Site Driveway

The future intersection of Quarry Road at Proposed Full Movement Site Driveway is a proposed unsignalized, three-legged intersection. The northbound minor street approach (Proposed Full Movement Site Driveway) is proposed to operate under stop control while the eastbound and westbound major street approaches (Quarry Road) will operate as free-flow.

Based on a preliminary site visit, it appears adequate sight distance is provided at the approximate Proposed Full Movement Site Driveway location.

Westbound Quarry Road at Proposed Full Movement Site Driveway Location

The capacity analysis results for the intersection are summarized in Table 13 below. The intersection is expected to operate with short delays during the AM and PM peak hours for the northbound minor street approach (Proposed Full Movement Site Driveway) at project buildout.

According to guidelines published in the NCDOT's *Policy On Street And Driveway Access to North Carolina Highways* (July 2003), turn lanes should be considered when the average daily traffic meets or exceeds 4,000 vehicles per day (existing plus proposed development site traffic). The projected 2027 daily traffic volume on Quarry Road is projected to exceed 4,000 vehicles per day at the Proposed Full Movement Site Driveway location. Therefore, turn lanes were evaluated at the intersection and based on NCDOT's *Warrant for Left and Right-Turn Lanes,* an exclusive westbound left-turn lane and exclusive right-turn lane are warranted.

Based on NCDOT's *Warrant for Left and Right-Turn Lanes* as well as the projected queue lengths at project buildout reported by Synchro and SimTraffic, the following roadway improvements are recommended to be constructed by the developer to accommodate site traffic:

- Construct an exclusive westbound left-turn lane on Quarry Road with 50 feet of storage and appropriate taper.
- Construct an exclusive eastbound right-turn lane on Quarry Road with 125 feet of storage and appropriate taper.
- Provide one ingress and one egress lane on the south leg of Proposed Full Movement Site Driveway.

The recommended storage length is based on the maximum queue length reported from SimTraffic. The storage length was not updated in the Synchro settings after running the initial SimTraffic simulation due to varying results that SimTraffic may provide with each iteration.

An additional scenario was considered that affects operations at this intersection. Given the long delays expected on the westbound minor street approach (Proposed Full Movement Site Driveway) at East Young Street and available capacity at other site driveways, it is reasonable to expect site traffic would divert to a driveway with less delay. Therefore, an additional scenario was considered that includes diverting a portion of the exiting left-turn site traffic from the Proposed Full Movement Site Driveway at East Young Street intersection to this driveway. The site traffic assumed to divert was the volume required to achieve

moderate delays for the westbound left-turn movement at the Proposed Full Movement Site Driveway at East Young Street intersection during the AM and PM peak hour with recommended improvements in place. As shown in Table 13, this intersection is expected to continue operating with short delays on the northbound approach (Proposed Full Movement Site Driveway) when considering the potential additional diverted site traffic utilizing this driveway.

Table 13: Level-of-Service: Quarry Road at Proposed Full Movement Site Driveway (Unsignalized)

Condition	AM Peak		PM Peak	
	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)
2027 Buildout	NBL/R – C (20.5) WBL – A (8.6)	No Turn Lanes	NBL/R – B (12.7) WBL – A (7.8)	No Turn Lanes
2027 Buildout with Improvements	NBL/R – C (17.9) WBL – A (8.6)	WBL – 3'/50' EBR – -'/-'	NBL/R – B (12.0) WBL – A (7.8)	WBL – 3'/33' EBR – -'/6'
2027 Buildout with Improvements and Diversion	NBL/R – C (21.8) WBL – A (8.6)	WBL – 3'/50' EBR – -'/-'	NBL/R – B (12.5) WBL – A (7.8)	WBL – 3'/33' EBR – -'/7'

East Young Street at Proposed Full Movement Site Driveway

The future intersection of East Young Street at Proposed Full Movement Site Driveway is a proposed unsignalized, three-legged intersection. The westbound minor street approach (Proposed Full Movement Site Driveway) is proposed to operate under stop control while the northbound and southbound major street approaches (East Young Street) will operate as free-flow.

Northbound East Young Street at Proposed Full Movement Site Driveway Location

Based on a preliminary site visit, it appears adequate sight distance is provided at the approximate Proposed Full Movement Site Driveway location.

The capacity analysis results for the intersection are summarized in Table 14 below. The intersection is expected to operate with long delays during the AM and PM peak hours for the westbound minor street approach (Proposed Full Movement Site Driveway) at project buildout. It is typical for minor street approaches to experience moderate to long delays during the peak hours while the major street free-flow approaches experience little to no delay.

According to guidelines published in the NCDOT's *Policy On Street And Driveway Access to North Carolina Highways* (July 2003), turn lanes should be considered when the average daily traffic meets or exceeds 4,000 vehicles per day (existing plus proposed development site traffic). The 2023 daily traffic volume on East Young Street was 6,100 vehicles per day north of Fowler Road. Therefore, turn lanes were evaluated at the intersection and according to NCDOT's *Warrant for Left and Right-Turn Lanes,* an exclusive northbound right-turn lane and southbound left-turn lane on East Young Street are warranted under 2027 buildout conditions.

Based on NCDOT's *Warrant for Left and Right-Turn Lanes* as well as the projected queue lengths at project buildout reported by Synchro and SimTraffic, the following roadway improvements are recommended to be constructed by the developer to accommodate site traffic:

- Construct an exclusive northbound right-turn lane on East Young Street with 100 feet of full-width storage and appropriate taper.
- Restripe the existing two-way left-turn lane on East Young Street to an exclusive southbound left-turn lane with 200 feet of storage.
- Provide one ingress and two egress lanes on the east leg of Proposed Full Movement Site Driveway. The two egress lanes should consist of a left-turn lane and a right-turn lane with 225 feet of full-width storage and appropriate taper.

The recommended storage lengths are based on the maximum queue length reported from SimTraffic. The storage length was not updated in the Synchro settings after running the initial SimTraffic simulation due to varying results that SimTraffic may provide with each iteration.

As shown in Table 14, the westbound minor street approach (Proposed Full Movement Site Driveway) is expected to operate with long delays during the peak hours. Given this delay and available capacity at the site driveways along Quarry Road, it is reasonable to expect site traffic would divert to a driveway with

less delay. Therefore, an additional scenario was considered that includes diverting a portion of the exiting left-turn site traffic from this driveway to the Proposed Full Movement Site Driveway at Quarry Road. The site traffic assumed to divert was the volume required to achieve moderate delays for the westbound left-turn movement at this driveway during the AM and PM peak hour with recommended improvements in place. The results of this additional capacity analysis scenario are shown in Table 14.

Table 14: Level-of-Service: East Young Street at Proposed Full Movement Site Driveway (Unsignalized)

Condition	AM Peak		PM Peak	
	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)	LOS and Delay (sec/veh)	Turn Lane Synchro 95% Queue Length/ SimTraffic Max Queue Length (ft)
2027 Buildout	WBL/R – F (322.1) SBL – B (12.4)	No Turn Lanes	WBL/R – F (144.5) SBL – B (10.6)	No Turn Lanes
2027 Buildout with Improvements	WB – F (59.9) WBL – F (95.4) WBR – C (24.8) SBL – B (12.4)	WBR – 45'/190' NBR – -'/9' SBL – 20'/127'	WB – E (41.5) WBL – F (62.9) WBR – C (17.9) SBL – B (10.6)	WBR – 25'/233' NBR – -'/18' SBL – 13'/82'
2027 Buildout with Improvements and Diversion	WB – D (32.7) WBL – E (49.6) WBR – C (24.8) SBL – B (12.4)	WBR – 45'/102' NBR – -'/-' SBL – 20'/116'	WB – D (32.3) WBL – E (49.6) WBR – C (17.9) SBL – B (10.6)	WBR – 25'/151' NBR – -'/25' SBL – 13'/94'

RECOMMENDATIONS

The recommended lane geometry is shown on Figure 10.

Based on requirements by the Town and NCDOT, the following roadway improvements are committed to by others and were included in the future year no-build and buildout scenarios:

East Young Street at US 401 Bypass:

- Extend the eastbound right-turn lane on US 401 to provide 400 feet of full-width storage. (The Point)
- Extend the second northbound right-turn lane on East Young Street to provide 600 feet of full-width storage (Woodlief Assemblage/Broadmoor)
- Convert the eastbound right-turn lane on US 401 to a free-flow right-turn lane. (Merritt Property)
- Construct a second southbound receiving lane on East Young Street that drops at The Point North Driveway. (Merritt Property)

US 401 Bypass at U-turn North (East) of East Young Street:

- Construct a second eastbound U-turn lane on US 401 with 400 feet of full-width storage (Woodlief/Broadmoor)

East Young Street at Quarry Road/The Point North Driveway:

- Install a traffic signal (The Point)
- Extend the southbound right-turn lane on East Young Street to provide continuous storage to US 401 Bypass. (Merritt Property)

East Young Street at Rolesville High School Student & Carpool Driveway/The Point South Driveway:

- Monitor for signalization and install traffic signal, if warranted. (Woodlief Assemblage/ Broadmoor)

Rolesville Road at Fowler Road/Merritt Property Southern Driveway:

- Construct the Merritt Property Southern Driveway/Fowler Road Extension as the west leg of the intersection and provide one ingress and egress lane.
- Construct a southbound right-turn lane on Rolesville Road with 100 feet of full-width storage. (Merritt Property)
- Construct a southbound left-turn lane on Rolesville Road with 100 feet of full-width storage. (Merritt Property)
- Construct a northbound left-turn lane on Rolesville Road with 100 feet of full-width storage. (Merritt Property)
- Monitor for signalization and install traffic signal, if warranted. (Merritt Property)

Rolesville Road at Mitchell Mill Road:

- Install a traffic signal. (multiple developer agreement)

All the committed improvements listed above are assumed to be in place by 2027 due to the likelihood that each improvement will be constructed prior to the full buildout year of the subject approved development.

Based on the capacity analysis presented herein, the following roadway improvements are recommended to be completed by the developer to accommodate project traffic:

East Young Street at Quarry Road/The Point North Driveway:

- Construct a second northbound through lane on East Young Street with 300 feet of storage and appropriate taper and the associated northbound receiving lane to tie into the second northbound right-turn lane at US 401.
- Restripe the eastbound approach of The Point North Driveway to consist of a shared through/left-turn lane and an exclusive right-turn lane.

Quarry Road at Proposed Right-In/Right-Out/Left-Out Site Driveway:

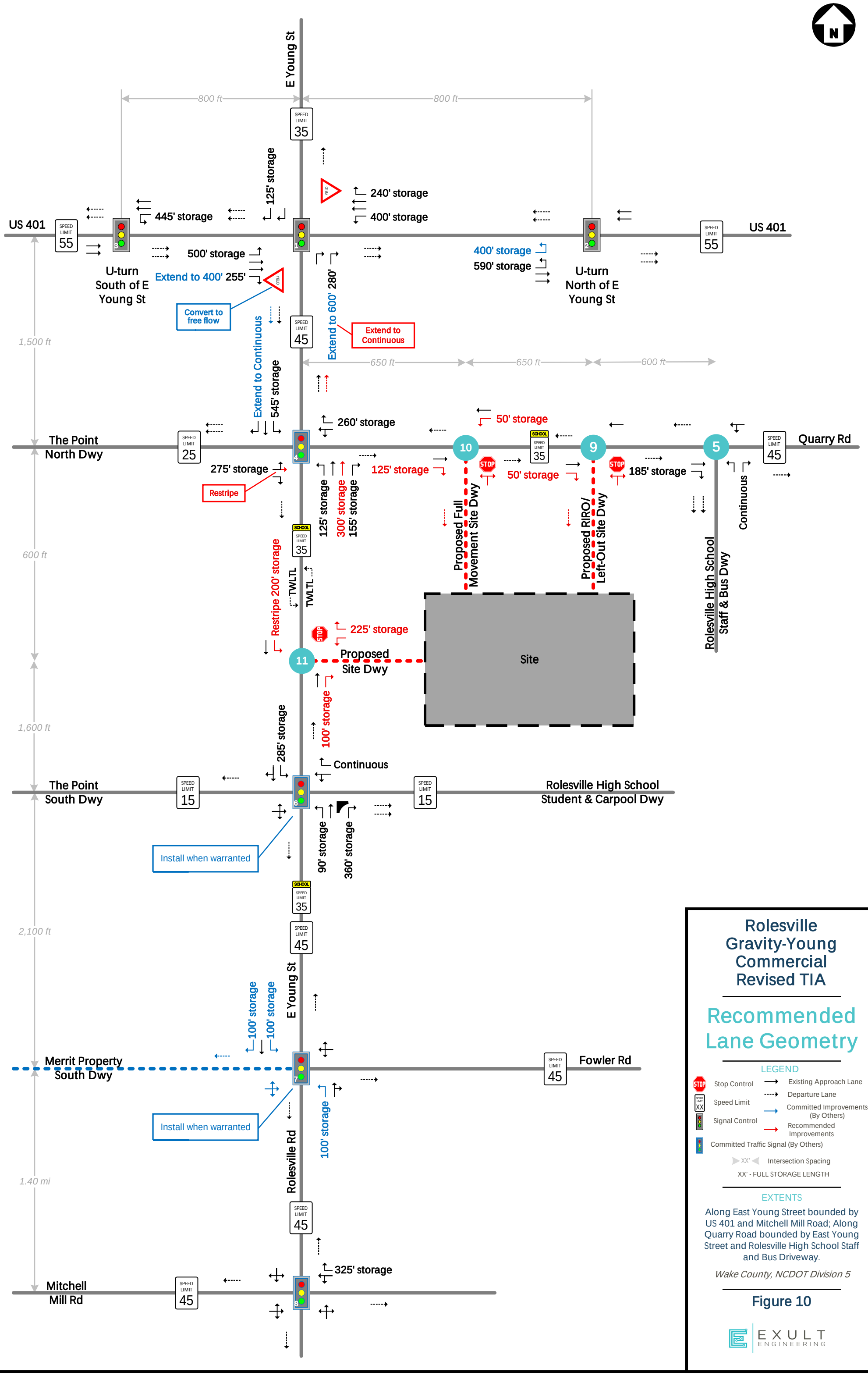
- Construct an exclusive eastbound right-turn lane on Quarry Road with 50 feet of storage and appropriate taper.
- Provide one ingress and one egress lane on the south leg of Proposed Right-In/Right-Out/Left-Out Site Driveway.

Quarry Road at Proposed Full Movement Site Driveway:

- Construct an exclusive westbound left-turn lane on Quarry Road with 50 feet of storage and appropriate taper.
- Construct an exclusive eastbound right-turn lane on Quarry Road with 125 feet of storage and appropriate taper.
- Provide one ingress and one egress lane on the south leg of Proposed Full Movement Site Driveway.

East Young Street at Proposed Full Movement Site Driveway:

- Construct an exclusive northbound right-turn lane on East Young Street with 100 feet of full-width storage and appropriate taper.
- Restripe the existing two-way left-turn lane on East Young Street to an exclusive southbound left-turn lane with 200 feet of storage.
- Provide one ingress and two egress lanes on the east leg of Proposed Full Movement Site Driveway. The two egress lanes should consist of a left-turn lane and a right-turn lane with 225 feet of full-width storage and appropriate taper.



Rolesville Gravity-Young Commercial Revised TIA

Recommended Lane Geometry

LEGEND

- Stop Control
- Speed Limit XX
- Signal Control
- Committed Traffic Signal (By Others)
- Existing Approach Lane
- Departure Lane
- Committed Improvements (By Others)
- Recommended Improvements
- XX' Intersection Spacing

XX' - FULL STORAGE LENGTH

EXTENTS

Along East Young Street bounded by US 401 and Mitchell Mill Road; Along Quarry Road bounded by East Young Street and Rolesville High School Staff and Bus Driveway.

Wake County, NCDOT Division 5

Figure 10

EXULT ENGINEERING

APPENDIX