Parker Ridge
Traffic Impact Analysis

Rolesville, North Carolina

February 2, 2023

Prepared for:

Town of Rolesville
502 Southtown Circle
Rolesville, NC 27571

Applicant:

Lennar Carolinas LLC
301 Fayetteville Street
Raleigh, NC 27601

Prepared by:

Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606

Sign-off Sheet

This document entitled Parker Ridge Traffic Impact Analysis was prepared by Stantec Consulting Services Inc. (“Stantec”) for the account of Town of Rolesville (the “Client”). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by Pierre Tong

(signature)

Pierre Tong, PE

Reviewed by

(signature)

Jeff Weller, PE

Approved by

(signature)

Matt Peach, PE, PTOE

2/2/2023

Table of Contents

LIST OF TABLES

LIST OF FIGURES

Executive Summary

The proposed Parker Ridge development is located on both sides of Redford Place Drive south of US 401 Business (South Main Street) in Rolesville, NC. Currently, the 86.76-acre site is expected to be a residential development consisting of single-family homes as well as townhomes. The current zoning is a mix of residential low density and residential/planned unit development (R&PUD). The applicant is pursuing a rezoning to Residential Medium Density (RM) and Residential High Density (RH).

The proposed development is planned to consist of 162 single-family homes and 114 townhomes with an anticipated completion date in 2028. Using the Institute of Transportation Engineers (ITE) Trip Generation Manual, it is estimated that at full build-out the development is expected to generate 2,391 new trips per average weekday. In the AM and PM peak hours, the development is expected to generate 170 AM peak hour trips (47 entering and 123 exiting) and 220 PM peak hour trips (134 entering and 86 exiting). Access to the site is envisioned to be provided via four driveways as follows:

- Access A will add a western leg to the existing roundabout on Redford Place Drive
- Access B will add an eastern leg to the existing roundabout on Redford Place Drive
- Access C will be provided via an extension of School Street
- Access D will consist of a connection out to Young Street to the east

There is a possibility for Access C to be removed from the development plan, therefore, this study is performed with and without the extension of School Street.

The purpose of this report is to evaluate the proposed development in terms of traffic conditions, evaluate the ability of the adjacent roadways to accommodate the additional traffic volumes, and recommend transportation improvements needed to mitigate congestion that may result from the additional site traffic. This report presents trip generation, trip distribution, traffic analysis, and recommendations for transportation improvements needed to meet anticipated traffic demands.

This report examines the following scenarios for the AM and PM peak hours:

- 2022 Existing
- 2028 No-Build
- 2028 Build with Access C
- 2028 Build Improved with Access C
- 2028 Build without Access C
- 2028 Build Improved without Access C

Capacity analysis for the AM and PM peak hours in each scenario was performed for the following existing intersections:

- SR 2226 (Jonesville Road) at Prides Crossing
- US 401 Business (South Main Street) at SR 2051 (Burlington Mills Road)
- Old Rogers Road/School Street at US 401 Business (South Main Street)
- Redford Place Drive/SR 2052 (Rogers Road) at US 401 Business (South Main Street)
- School Street at School Driveway/Scarboro Driveway

- Redford Place Drive at School Driveway
- US 401 at SR 1003 (Young Street)

The study will also include the following planned (i.e., future) intersections:

- US 401 Business (South Main Street) at SR 2051 (Realigned Burlington Mills Road)
- US 401 Business (South Main Street) at Virginia Water Drive Extension

The results of the capacity analysis at these existing and planned intersections, in addition to the aforementioned driveways, are summarized in Tables ES-1 and ES-2:

Table ES-1: Level of Service Summary Table with Access C

Level of Service (Delay, sec/veh)	2022 Existing		2028 No-Build		2028 Build		2028 Build Improved	
	AM	PM	AM	PM	AM	PM	AM	PM
Jonesville Road at Prides Crossing	B (10.3)	B (11.1)	B (11.9)	B (13.4)	B (12.0)	B (13.7)	B (12.0)	B (13.7)
South Main Street at Virginia Water Drive Extension	--	--	C (29.8)	D (46.3)	C (30.2)	D (46.9)	C (30.2)	D (46.9)
South Main Street at Realigned Burlington Mills Road	--	--	D (50.0)	D (43.4)	D (48.9)	D (43.7)	D (48.9)	D (43.7)
South Main Street at Burlington Mills Road	C (22.2)	B (18.0)	C (21.9)	C (20.1)	C (22.1)	C (20.2)	C (22.1)	C (20.2)
Redford Place Drive/Rogers Road at South Main Street	C (26.7)	C (27.0)	E (62.5)	E (73.3)	E (64.0)	E (73.8)	E (64.0)	E (73.8)
Old Rogers Road/School Street at South Main Street	C (22.5)	D (28.7)	F (158.5)	F (##)	F (145.6)	F (##)	F (145.6)	F (##)
School Street at School Driveway/Scarboro Driveway/Access C	--	--	A (8.9)	A (8.6)	A (8.9)	A (8.6)	A (8.9)	A (8.6)
Redford Place Drive at School Driveway	B (10.5)	A (9.7)	B (11.6)	B (10.6)	B (11.9)	B (10.8)	B (11.9)	B (10.8)
Redford Place Drive at Access A/Access B	--	--	--	--	A (3.8)	A (4.2)	A (3.8)	A (4.2)
Young Street at Access D	--	--	--	--	B (14.7)	C (21.3)	B (14.7)	C (20.7)
US 401 at Young Street (North)	A (8.0)	A (9.9)	A (9.0)	B (10.5)	B (10.2)	B (10.9)	B (10.2)	B (10.9)
US 401 at Young Street (South)	A (9.1)	A (8.1)	B (17.6)	D (44.2)	B (18.0)	D (46.4)	B (18.0)	D (46.4)
US 401 Eastern U-Turn	A (2.8)	B (11.8)	A (2.7)	A (3.3)	A (2.7)	A (3.6)	A (2.7)	A (3.6)
US 401 Western U-Turn	A (2.0)	A (4.2)	A (2.3)	A (2.9)	A (2.3)	A (3.0)	A (2.3)	A (3.0)

	Signalized Intersection
	Stop Controlled Intersection
	Roundabout
-	Intersection Not Analyzed In Scenario
##	Delay Exceeds 300 Seconds

Table ES-2: Level of Service Summary Table without Access C

Level of Service (Delay, sec/veh)	2022 Existing		2028 No-Build		2028 Build		2028 Build Improved	
	AM	PM	AM	PM	AM	PM	AM	PM
Jonesville Road at Prides Crossing	B (10.3)	B (11.1)	B (11.9)	B (13.4)	B (12.0)	B (13.7)	B (12.0)	B (13.7)
South Main Street at Virginia Water Drive Extension	--	--	C (29.8)	D (46.3)	C (30.2)	D (46.9)	C (30.2)	D (46.9)
South Main Street at Realigned Burlington Mills Road	--	--	D (50.0)	D (43.4)	D (48.9)	D (43.7)	D (48.9)	D (43.7)
South Main Street at Burlington Mills Road	C (22.2)	B (18.0)	C (21.9)	C (20.1)	C (22.1)	C (20.2)	C (22.1)	C (20.2)
Redford Place Drive/Rogers Road at South Main Street	C (26.7)	C (27.0)	E (62.5)	E (73.3)	E (64.0)	E (73.8)	E (64.0)	E (73.8)
Old Rogers Road/School Street at South Main Street	C (22.5)	D (28.7)	F (158.5)	F (##)	F (177.9)	F (##)	F (177.9)	F (##)
School Street at School Driveway/Scarboro Driveway/Access C	--	--	A (8.9)	A (8.6)	A (8.9)	A (8.6)	A (8.9)	A (8.6)
Redford Place Drive at School Driveway	B (10.5)	A (9.7)	B (11.6)	B (10.6)	B (11.9)	B (10.8)	B (11.9)	B (10.8)
Redford Place Drive at Access A/Access B	--	--	--	--	A (3.8)	A (4.2)	A (3.8)	A (4.2)
Young Street at Access D	--	--	--	--	C (15.7)	C (24.0)	C (15.6)	C (23.4)
US 401 at Young Street (North)	A (8.0)	A (9.9)	A (9.0)	B (10.5)	B (10.2)	B (10.9)	B (10.2)	B (10.9)
US 401 at Young Street (South)	A (9.1)	A (8.1)	B (17.6)	D (44.2)	B (18.0)	D (46.4)	B (18.0)	D (46.4)
US 401 Eastern U-Turn	A (2.8)	B (11.8)	A (2.7)	A (3.3)	A (2.7)	A (3.6)	A (2.7)	A (3.6)
US 401 Western U-Turn	A (2.0)	A (4.2)	A (2.3)	A (2.9)	A (2.3)	A (3.0)	A (2.3)	A (3.0)

	Signalized Intersection
	Stop Controlled Intersection
	Roundabout
-	Intersection Not Analyzed In Scenario
##	Delay Exceeds 300 Seconds

The Town of Rolesville's Land Development Ordinance (LDO)[7], Section 8.E, establishes the following Level of Service Standards:

1. *The traffic impact analysis must demonstrate that the proposed development would not cause build-out-year, peak-hour levels of service on any arterial or collector road or intersection within the study area to fall below Level of Service (LOS) "D," as defined by the latest edition of the Highway Capacity Manual, or, where the existing level of service is already LOS "E" that the proposed development would not cause the LOS to fall to the next lower letter grade.*

2. *If the road segment or intersection is already LOS "F," the traffic impact analysis must demonstrate that the proposed development, with any proposed improvements, would not cause build-out year peak-hour operation to degrade more than five (5) percent of the total delay on any intersection approach.*

With the addition of traffic generated by the proposed development, the northbound School Street and southbound Old Rogers Road approach of the South Main Street at Old Rogers Road/School Street intersection increases in delay by greater than 5%. It is common for unsignalized side-street approaches to operate with high delays during peak periods. If high delays are experienced on the stop-controlled approaches, drivers may opt for alternative routes. Even so, the intersection was evaluated for potential improvements to meet the requirements of the Rolesville LDO:

- The installation of a traffic signal would improve the LOS of the side streets significantly. This, however, is not anticipated to be permitted by NCDOT due to the proximity of the intersection to the adjacent signalized intersection of South Main Street at Redford Place Drive/Rogers Road. In addition, the low traffic volumes on the side-street approaches of Old Rogers Road and School Street are not anticipated to meet the warrants for the installation of a traffic signal included in the Manual on Uniform Traffic Control Devices (MUTCD).

- The construction of dedicated left-turn turn lanes on Old Rogers Road and School Street reduces delay but does not mitigate the impact of the proposed development. This is attributed to low volumes of traffic on the side-street approaches and high through volumes on South Main Street. The installation of turn lanes may also impact adjacent property owners. As a result, the installation of turn lanes on Old Rogers Road and School Street is not recommended.

- Converting the southbound approach of Old Rogers Road to right-in/right-out access by installing channelization was shown to reduce delays on the side streets such that School Street is anticipated to operate at LOS C and Old Rogers Road is anticipated to operate at LOS D during the PM peak hour. This would require left turns from Old Rogers Road to be redirected to Rogers Road and use the traffic signal at the intersection of South Main Street at Redford Place Drive/Rogers Road; increasing travel time for existing vehicles on the Old Rogers Road approach. Furthermore, the restriction of access without the installation of a median has only limited effectiveness. As a result, the restriction of access is not recommended.

Therefore, no improvements are recommended at the South Main Street at Old Rogers Road/School Street intersection in conjunction with this development. Consideration should be made for limiting the southbound Old Rogers Road approach to right-in/right-out access in the future.

Based on the findings of this study, specific improvements have been identified and some should be completed as part of the proposed development. These improvements are valid for both scenarios with and without Access C.

Jonesville Road at Prides Crossing

- No improvements are recommended at this intersection

South Main Street at Realigned Burlington Mills Road

- No improvements are recommended at this intersection

Redford Place Drive/Rogers Road at South Main Street

- No improvements are recommended at this intersection

Old Rogers Road/School Street at South Main Street

- No improvements are recommended at this intersection

School Street at School Driveway/Scarboro Driveway/Access C

- If Access C is constructed, the driveway should be constructed with one ingress lane and one egress lane with 100 feet of internal protective stem
- If Access C is not pursued, it is recommended that the connection be removed from the Town's Community Transportation Plan (CTP)

Redford Place at School Driveway

- No improvements are recommended at this intersection

US 401 at Young Street

- No improvements are recommended at this intersection

US 401 WB U-Turn

- No improvements are recommended at this intersection

US 401 EB U-Turn

- No improvements are recommended at this intersection

South Main Street at Virginia Water Drive Extension

- No improvements are recommended at this intersection

Redford Place Drive at Access A/Access B

- Construct Access A and Access B with one ingress lane and one egress lane at the existing roundabout along Redford Place Drive south of the School Driveway intersection. Both intersections should have a minimum internal protective stem of 100 feet

Young Street at Access D

It is recommended that Access D be constructed by others as a full-movement access point, with one ingress lane and one egress lane with 100 feet of internal protective stem. A northbound left turn lane should be provided in conjunction with construction of the access point with 75 feet of full-width storage and appropriate taper.

These recommendations are illustrated in Figure ES-1.

Figure ES-1: Recommended Improvements

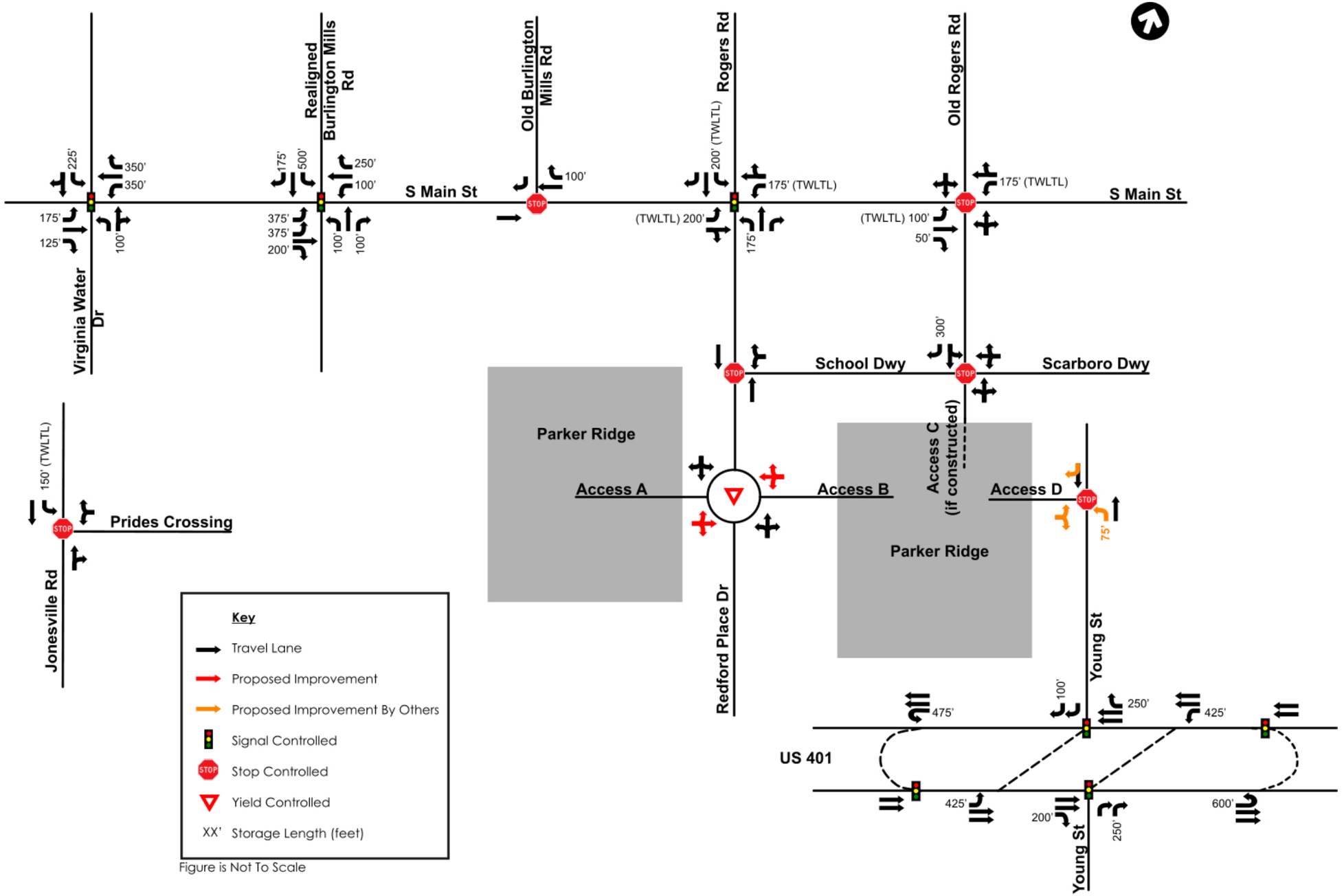


Figure is Not To Scale

1.0 INTRODUCTION

The proposed Parker Ridge development is located on both sides of Redford Place Drive south of US 401 Business (South Main Street) in Rolesville, NC. The current zoning is a mix of residential low density and residential/planned unit development (R&PUD). The applicant is pursuing a rezoning to Residential Medium Density (RM) and Residential High Density (RH). The 86.76-acre site is anticipated to be completed in 2028 and consists of 162 single-family homes and 114 townhomes. The project location is shown in Figure 1. The site plan, prepared by BGE, Inc., can be found in Figure 2.

The traffic analysis will consider future build conditions during the build-out year (2028). Access to the site is anticipated to be provided by up to four (4) driveways as follows:

- Access A will add a western leg to the existing roundabout on Redford Place Drive
- Access B will add an eastern leg to the existing roundabout on Redford Place Drive
- Access C will connect to School Street
- Access D will create a new driveway onto Young Street

The traffic analysis was requested to be performed with and without Access C due to concerns that development traffic would interfere with Rolesville Elementary School pick-up and drop-off operations. Therefore, the analysis scenarios are as follows:

- 2022 Existing
- 2028 No-Build
- 2028 Build with Access C
- 2028 Build Improved with Access C
- 2028 Build without Access C
- 2028 Build Improved without Access C

The purpose of this report is to evaluate the development in terms of projected vehicular traffic conditions, evaluate the ability of the adjacent roadways to accommodate the additional traffic, and recommend transportation improvements needed to mitigate congestion that may result from additional site traffic. This report presents trip generation, trip distribution, traffic analyses, and recommendations for improvements needed to meet anticipated traffic demands. The analysis examines the AM and PM peak hours for the aforementioned analysis scenarios.

Figure 1: Site Location

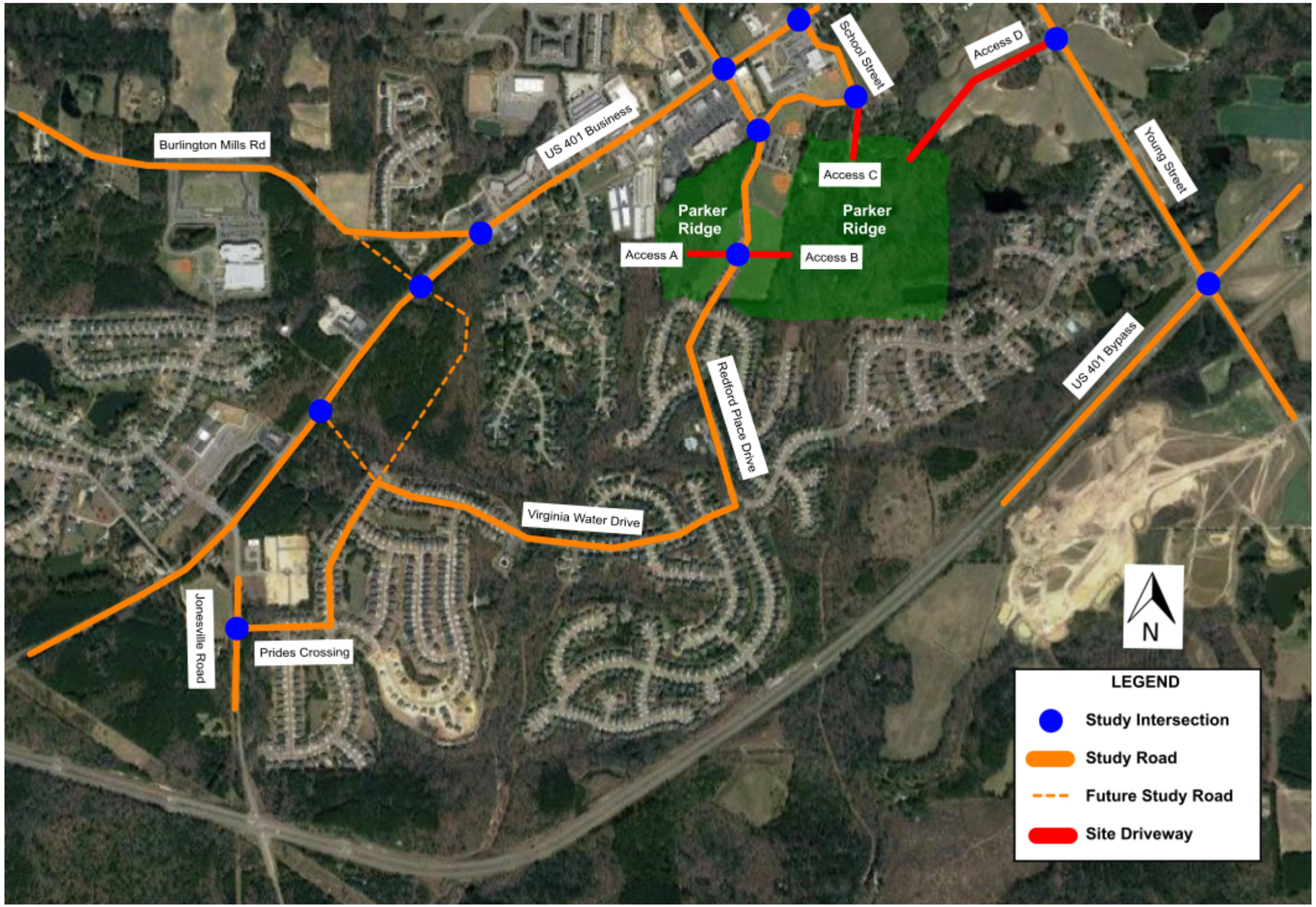
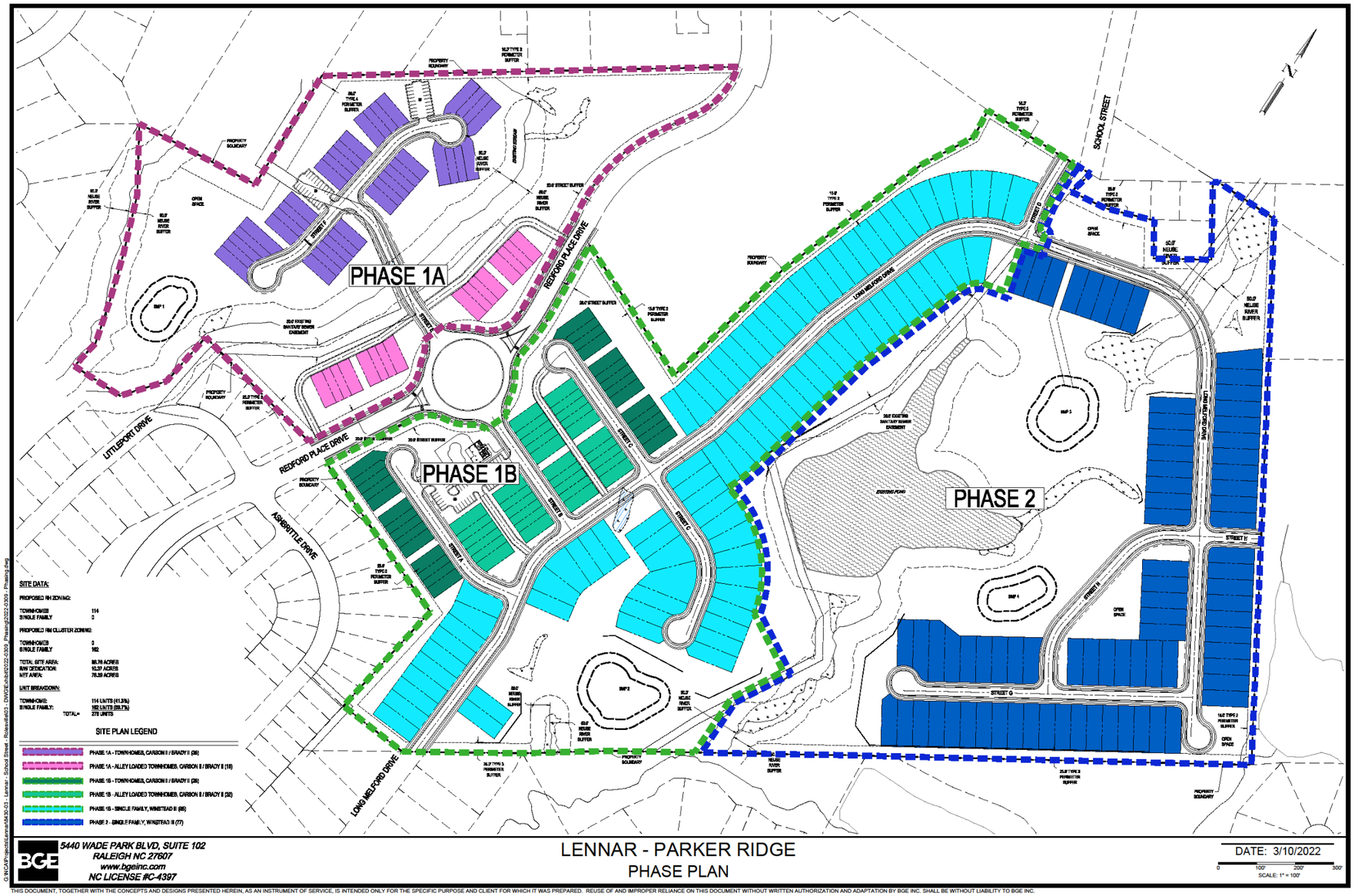


Figure 2: Site Plan



2.0 INVENTORY OF TRAFFIC CONDITIONS

2.1 STUDY AREA

Stantec coordinated with the Town of Rolesville, the applicant, and the North Carolina Department of Transportation (NCDOT) to determine the appropriate study area and assumptions. The following existing intersections were agreed upon to be analyzed to determine the impacts associated with this development. These intersections are shown in Figure 1.

- SR 2226 (Jonesville Road) at Prides Crossing
- US 401 Business (South Main Street) at SR 2051 (Burlington Mills Road)
- Redford Place Drive/SR 2052 (Rogers Road) at US 401 Business (South Main Street)
- Old Rogers Road/School Street at US 401 Business (South Main Street)
- School Street at School Driveway/Scarboro Driveway
- Redford Place Drive at School Driveway
- US 401 at SR 1003 (Young Street)
- US 401 at Young Street Westbound U-Turn
- US 401 at Young Street Eastbound U-Turn

2.2 PROPOSED ACCESS

Access to the site is envisioned to be provided by up to four access points:

- Access A will add a western leg to the existing roundabout on Redford Place Drive
- Access B will add an eastern leg to the existing roundabout on Redford Place Drive
- Access C will connect to School Street
- Access D will create a new full-movement driveway onto Young Street

The location of Access D on Young Street is unknown at this time. The driveway is anticipated to be located south of Perry Street. This and the other proposed access points are shown in Figure 1.

The traffic analysis was requested to be performed with and without Access C due to concerns that development traffic would interfere with Rolesville Elementary School pick-up and drop-off operations.

2.3 EXISTING CONDITIONS

Table 1 provides a detailed description of the existing study area roadway network. All functional classification and average annual daily traffic (AADT) information were obtained from NCDOT.

Table 1: Existing Conditions

Road Name	Road Number	Primary Cross-Section	Functional Classification[1]	AADT[2] (year)	Speed Limit (mph)	Maintenance Agency
Burlington Mills Road	SR 2051	Two-Lane Undivided	Major Collector	4,000 vpd (2021)	35	NCDOT
Jonesville Road	SR 2226	Two-Lane Undivided	Local Road	3,000 vpd (2016)	35	NCDOT
South Main Street	US 401 Business	Two-Lane w/ TWLTL*	Principal Arterial	13,500 vpd (2021)	35	NCDOT
Old Rogers Road	-	Two-Lane Undivided	Local Road	-	35	Town of Rolesville
Prides Crossing	-	Two-Lane Undivided	Local Road	-	25	Town of Rolesville
Redford Place Drive	-	Two-Lane Undivided	Local Road	-	25	Town of Rolesville
Rogers Road	SR 2052	Four-Lane w/TWLTL*	Major Collector	9,000 vpd (2019)	35	NCDOT
School Driveway	-	Two-Lane One-Way	Private Driveway	-	-	WCPSS
School Street	-	Two-Lane Undivided	Local Road	-	35	Town of Rolesville
US 401	US 401	Four-Lane Divided	Principal Arterial	15,500 vpd (2021)	55	NCDOT
Young Street	SR 1003	Two-Lane Undivided	Minor Arterial	7,200 vpd (2021)	35	NCDOT

*TWLTL = Continuous Two-Way Left-Turn Lane

The existing lane configuration and traffic control for the study area intersections are illustrated in Figure 3.

2.4 FUTURE CONDITIONS

The following sub-sections discuss the projects that are anticipated to modify the study area intersections between 2022 and the future year 2028. The future year lane configuration and traffic control for the study area intersections are illustrated in Figure 4.

2.4.1 U-6241 (South Main Street)

The U-6241 project will realign Burlington Mills Road near South Main Street as well as make streetscape and multimodal improvements along South Main Street. As part of the project, geometric improvements will be made in the study area, notably, removing the dedicated westbound right turn lane at the South Main Street & Rogers Road/Redford Place Drive intersection and re-striping the existing westbound through lane to a shared thru-right turn lane.

2.4.2 Wallbrook

The following improvements were committed to by the Wallbrook development:

South Main Street at Realigned Burlington Mills Road

- Construct dual northbound exclusive left-turn lanes with 375 feet of full-width storage and appropriate taper
- Construct an exclusive northbound right-turn lane with 200 feet of full-width storage and appropriate taper
- Construct an exclusive westbound left-turn lane with 100 feet of full-width storage and appropriate taper
- Construct an exclusive westbound right-turn lane with 100 feet of full-width storage and appropriate taper
- Construct an exclusive eastbound left-turn lane with 500 feet of full-width storage and appropriate taper
- Construct an exclusive eastbound right-turn lane with 175 feet of full-width storage and appropriate taper
- Construct an exclusive southbound left-turn lane with 100 feet of full-width storage and appropriate taper
- Construct an exclusive southbound right-turn lane with at least 250 feet of full-width storage and appropriate taper

South Main Street at Virginia Water Drive Extension

- Virginia Water Drive will be extended through the development and intersect South Main Street as a full-movement intersection controlled by a traffic signal. Virginia Water Drive will also be extended to provide access to South Main Street, or the land uses developed as a part of Wallbrook on the west side of South Main Street.
- Construct an exclusive northbound left-turn lane with 175 feet of storage and appropriate taper
- Construct an exclusive northbound right-turn lane with 125 feet of full-width storage and appropriate taper
- Construct an exclusive southbound left-turn lane with 350 feet of full-width storage and appropriate taper
- Construct an exclusive southbound right-turn lane with 350 feet of full-width storage and appropriate taper
- Construct an exclusive eastbound left-turn lane with 225 feet of storage and appropriate taper
- Construct an exclusive westbound right-turn lane with 100 feet of full-width storage and appropriate taper

A copy of the TIA is contained in the Appendix. The Wallbrook development is discussed in more detail in Section 7.2.9.

2.4.3 Scarboro

The Scarboro development will construct a new driveway along School Street, at the existing School Street & School Driveway intersection. The Scarboro development is discussed in more detail in Section 7.2.5.

Figure 3: 2022 Existing Lanes and Traffic Control

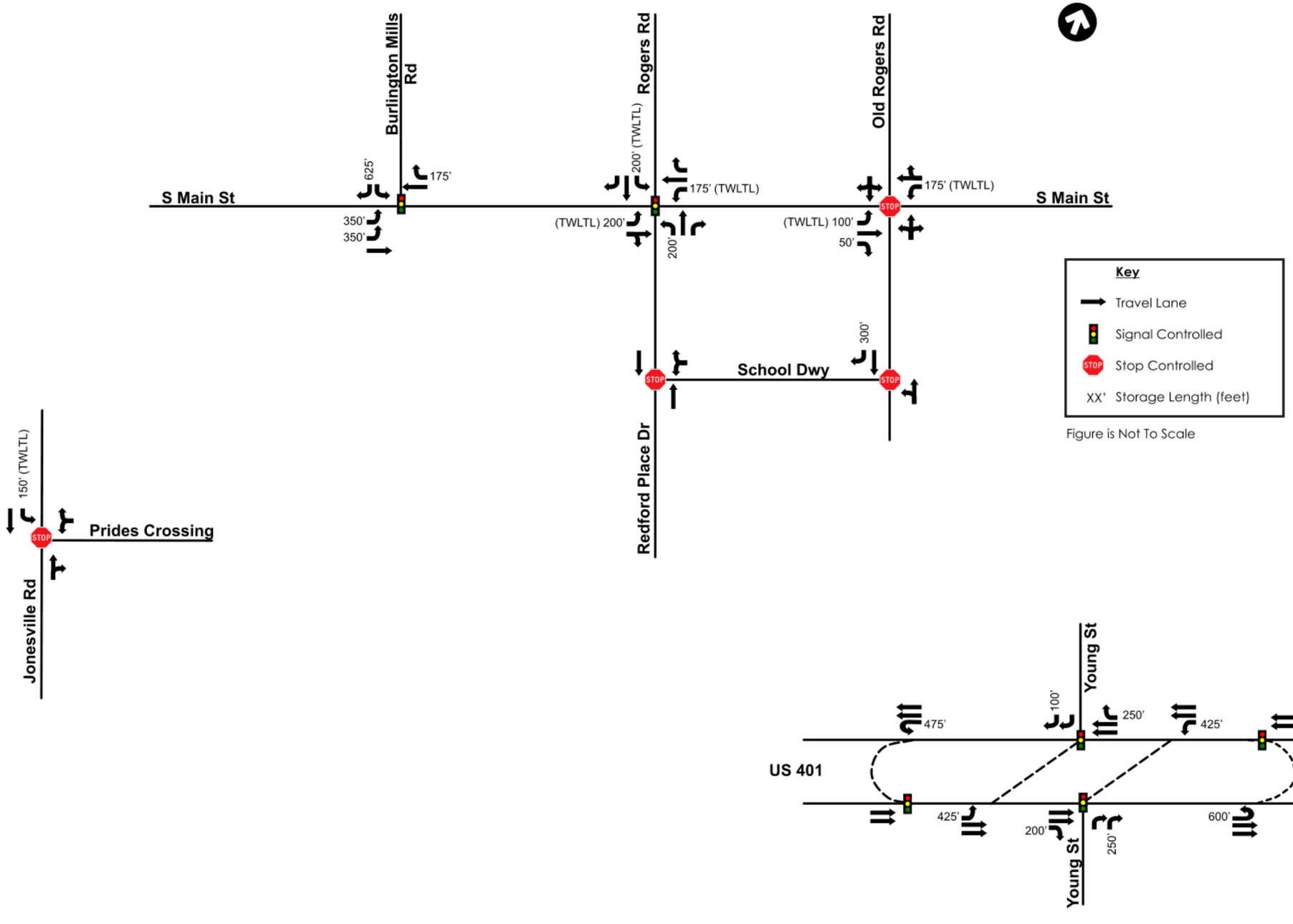


Figure 4: 2028 No-Build Lanes and Traffic Control

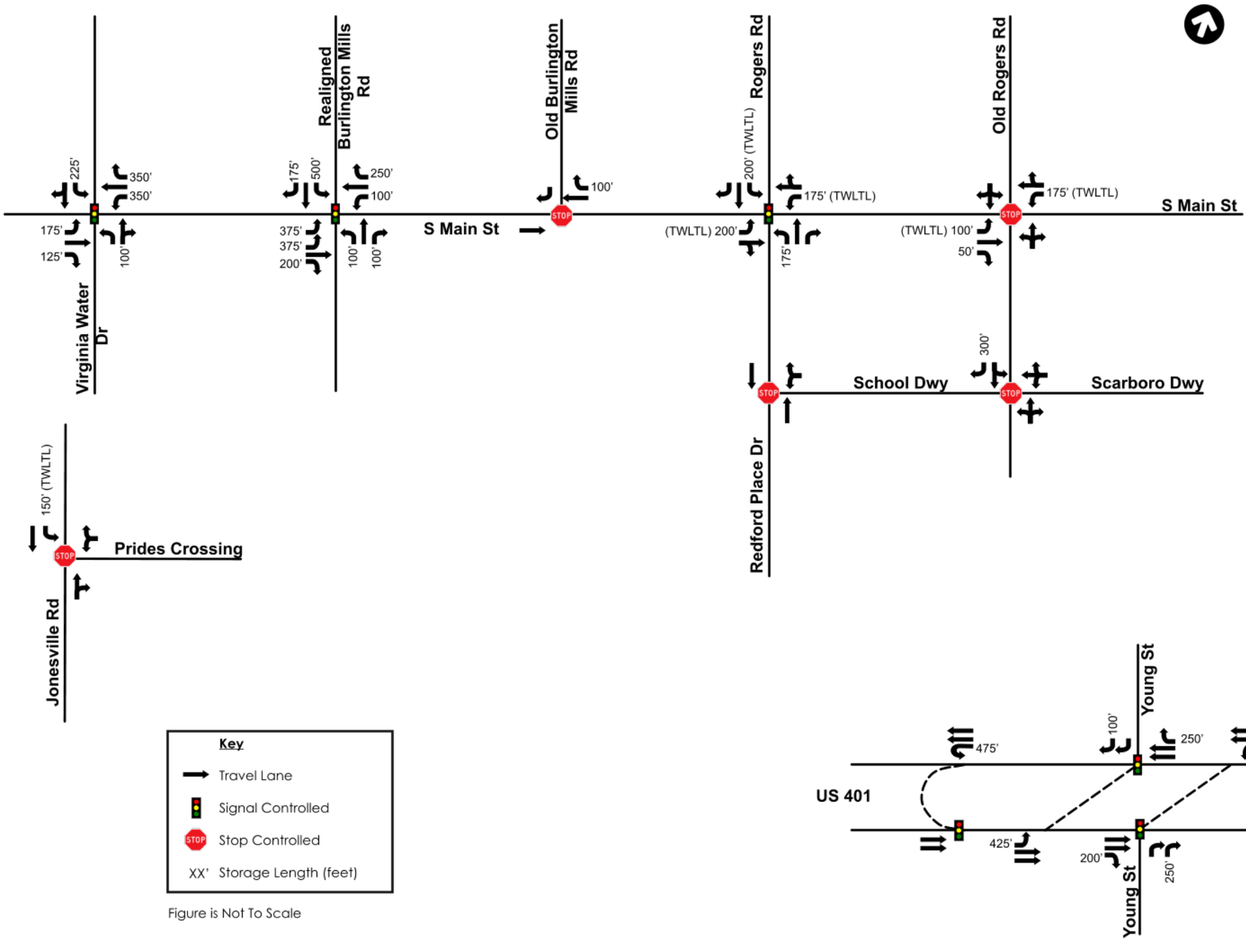


Figure is Not To Scale

3.0 TRIP GENERATION AND DISTRIBUTION

3.1 TRIP GENERATION

Trip generation for the proposed development was performed using the 11th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual[3]. The Rate versus Equation spreadsheet published by NCDOT[4] was used to supplement the ITE methodology. No trip reductions were taken for internal capture or pass-by traffic. Trip generation for the proposed development is shown in Table 2.

Table 2: Trip Generation

Land Use	Size	Daily			AM Peak			PM Peak		
		Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit
Single-Family Detached Housing (LUC 210)	162 Units	1,573	786	787	116	30	86	156	98	58
Single-Family Attached Housing (LUC 215)	114 Units	818	409	409	54	17	37	64	36	28
Total Trips Generated		**2,391**	**1,195**	**1,196**	**170**	**47**	**123**	**220**	**134**	**86**

3.2 SITE TRIP DISTRIBUTION

To accurately determine the effect of the proposed development on the surrounding roadway network, an estimate of the expected distribution of traffic entering and exiting the site is needed. These percentages were developed using a combination of existing traffic volume counts, historic AADTs provided by NCDOT, and engineering judgment. This trip distribution was submitted as part of NCDOT's TIA Scoping Checklist contained in the Appendix. All traffic volume calculations can be found in the Appendix.

- 35% to/from the west on US 401
- 10% to/from the west on South Main Street
- 10% to/from the north on Rogers Road
- 10% to/from the east on South Main Street
- 10% to/from the north on Young Street
- 10% to/from the east on US 401
- 10% to/from the south on Young Street
- 5% to/from the south on Jonesville Road

The trip distribution for the proposed development with Access C is shown in Figure 5. The corresponding trip assignment is shown in Figure 6. The trip distribution without Access C is shown in Figure 7. The trip assignment without Access C is shown in Figure 8.

Figure 5: Trip Distribution with Access C

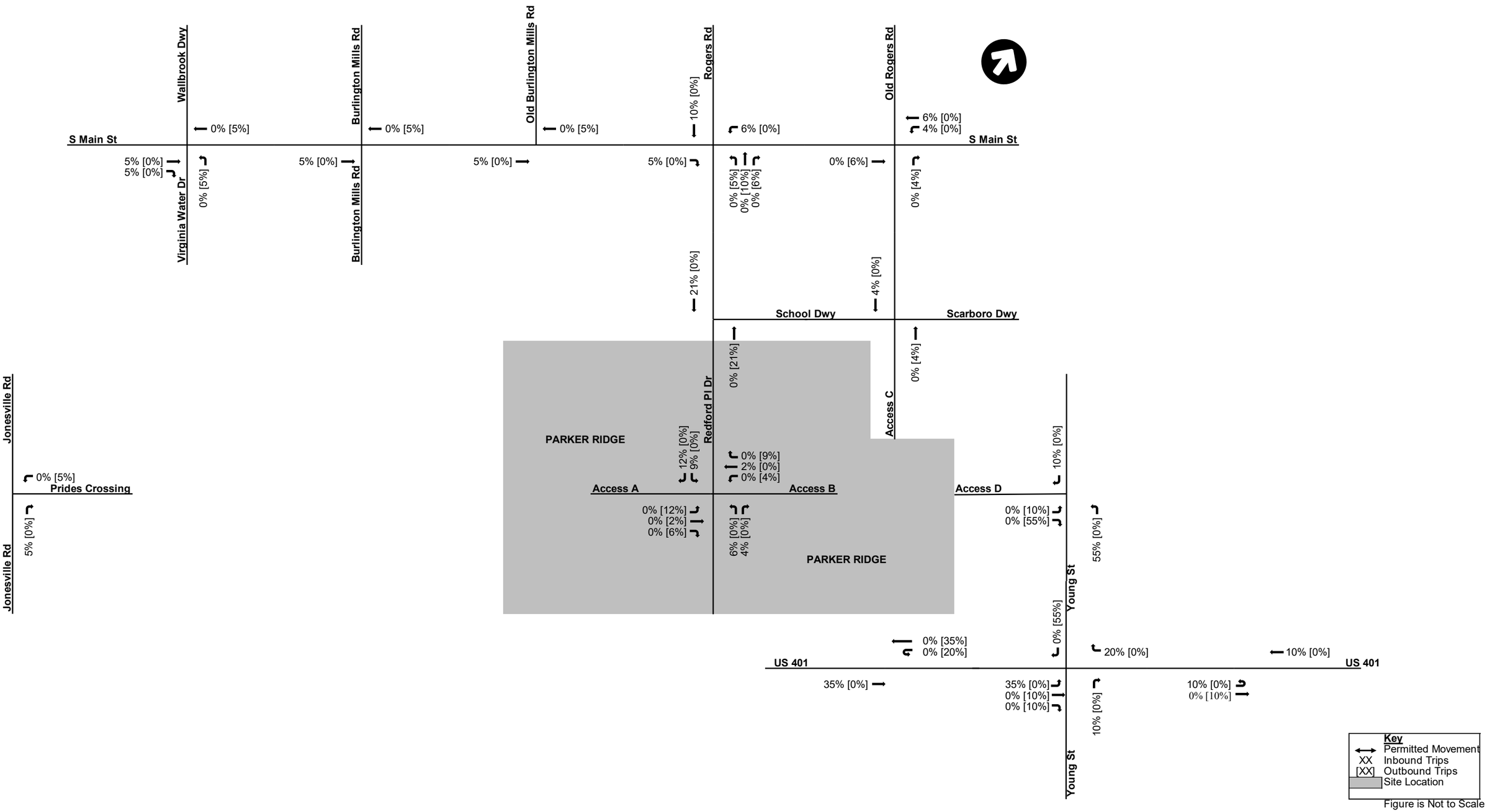


Figure is Not to Scale

Figure 6: Trip Assignment with Access C

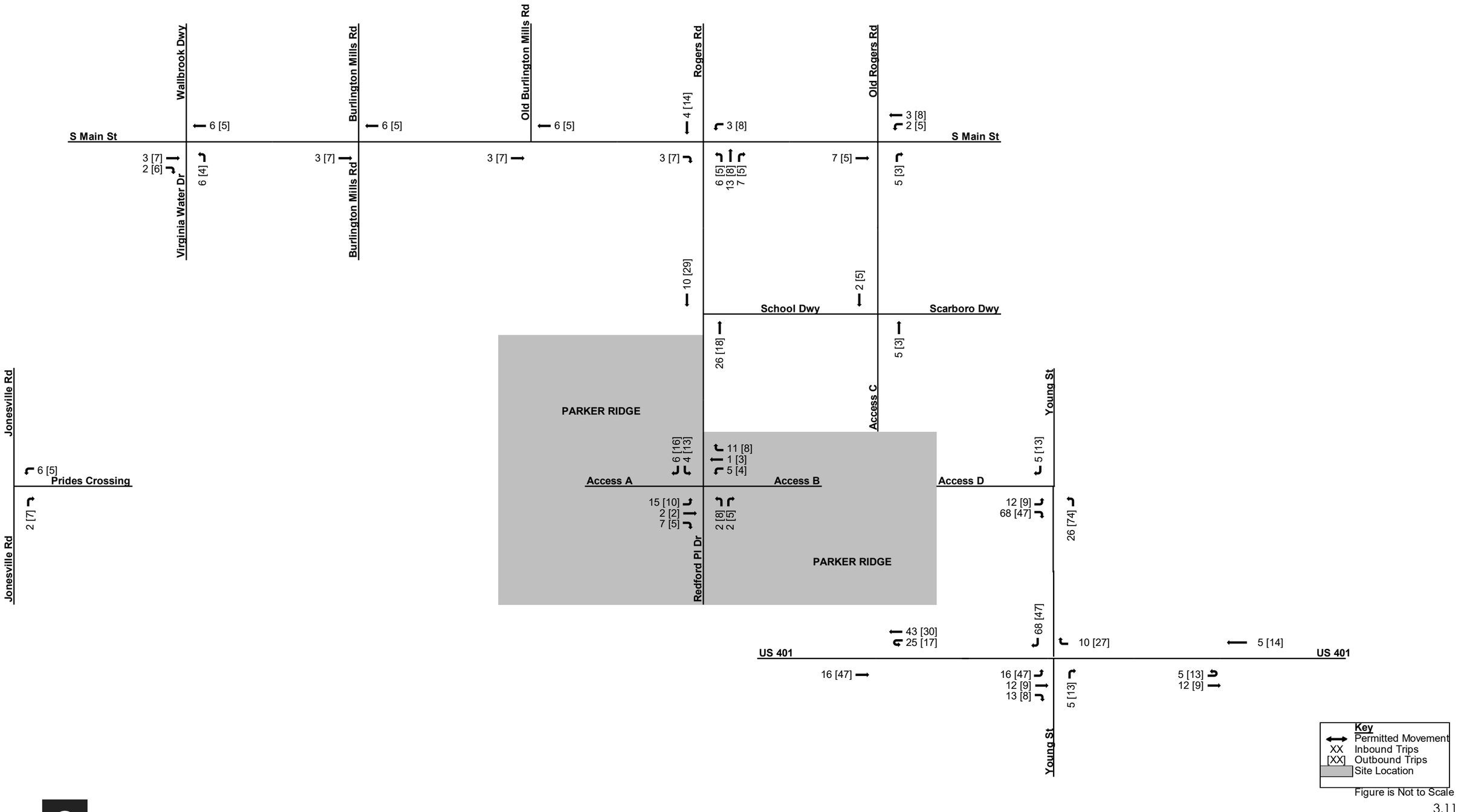


Figure is Not to Scale

Figure 7: Trip Distribution without Access C

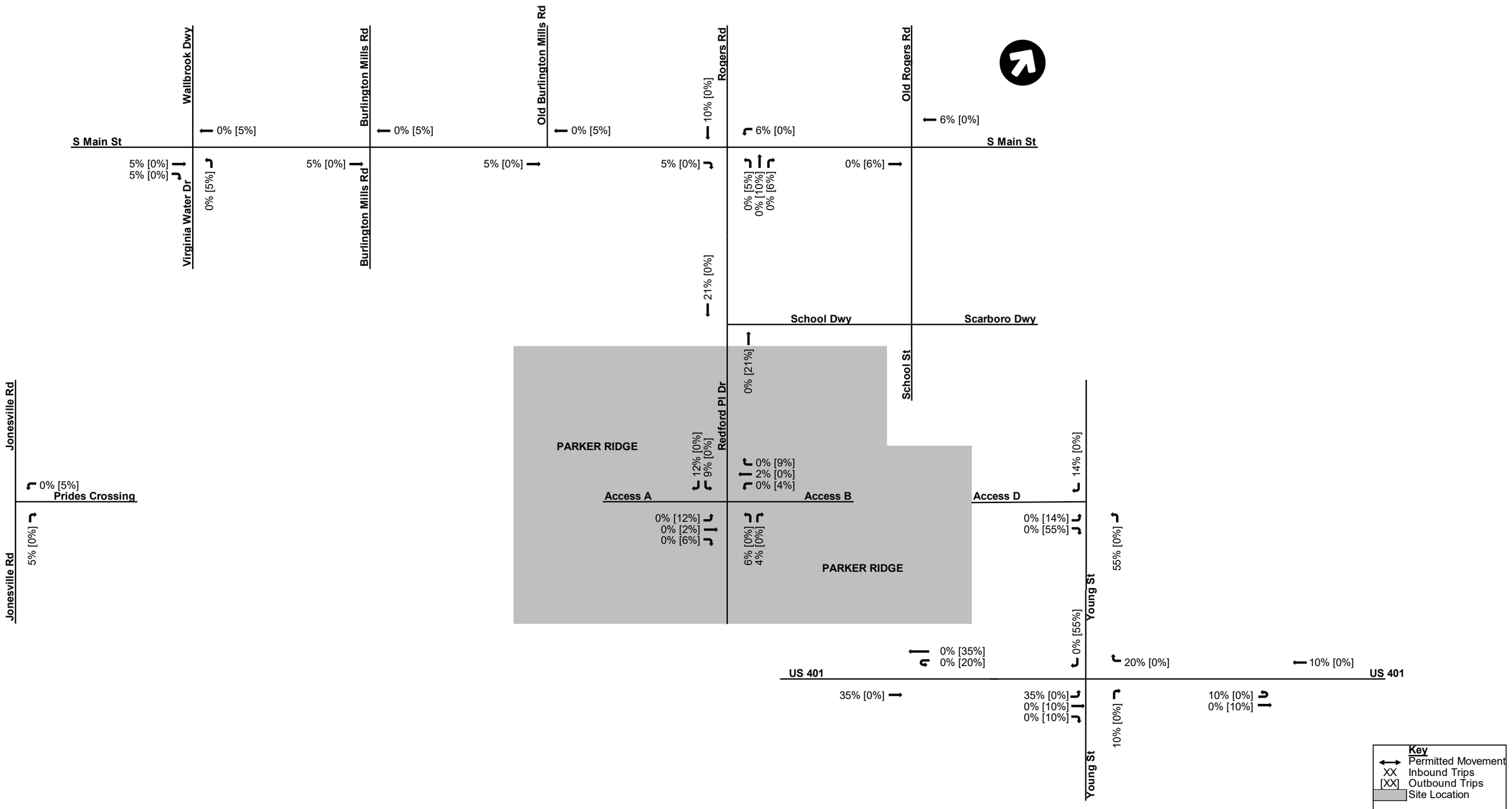


Figure is Not to Scale

Figure 8: Trip Assignment without Access C

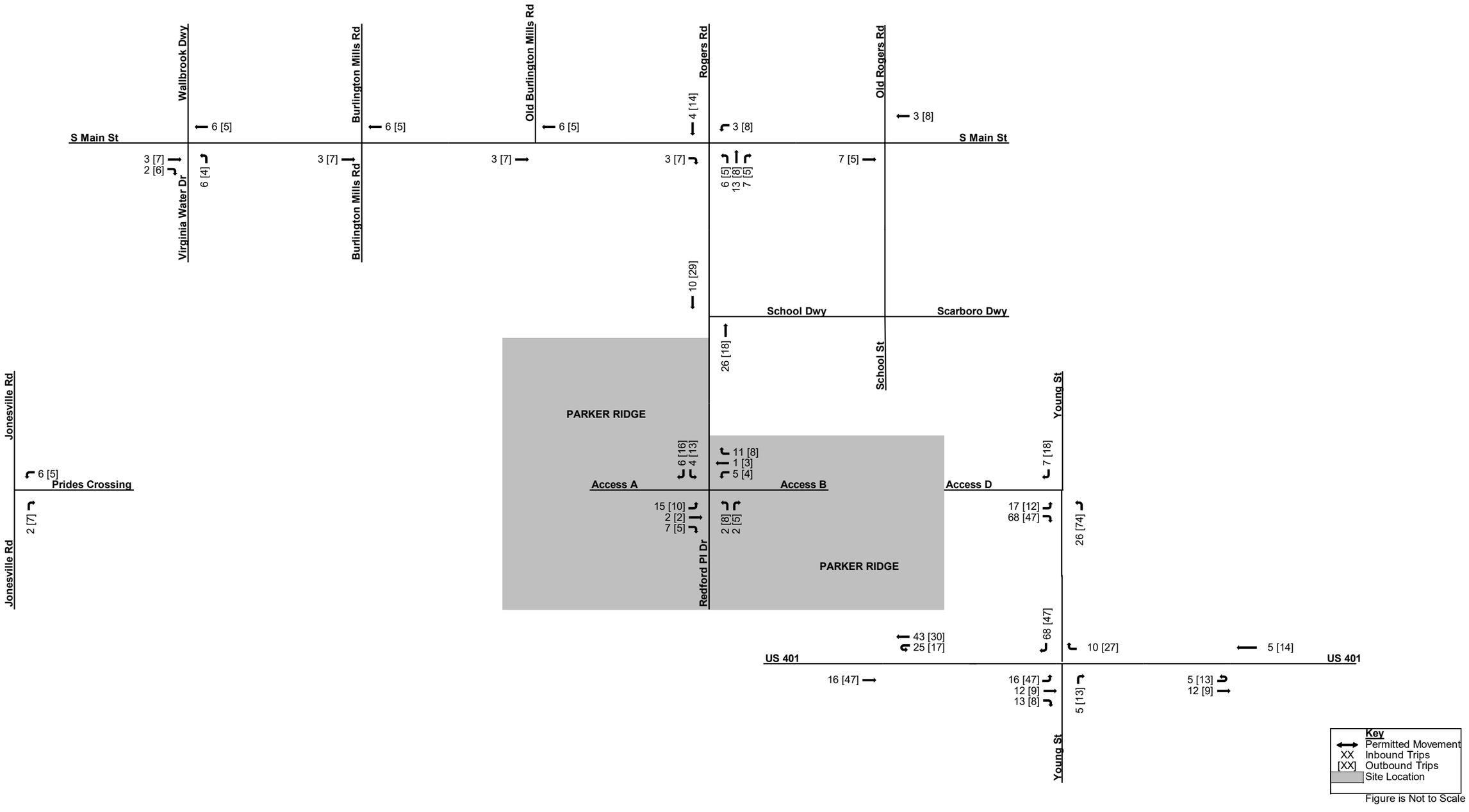


Figure is Not to Scale

4.0 TRAFFIC VOLUMES: 2022 EXISTING

4.1 DATA COLLECTION

On Tuesday, May 17, 2022, AM (7:00 – 9:45 AM) and PM (4:00 – 6:00 PM) turning movement counts were collected at the following intersection:

- South Main Street at Burlington Mills Road

On Thursday, June 9, 2022, AM (7:00 – 9:45 AM) and PM (4:00 – 6:00 PM) turning movement counts were collected at the following intersections:

- Old Rogers Road/School Street at South Main Street (US 401 Business)
- Redford Place Drive/Rogers Road at South Main Street (US 401 Business)
- School Street at School Driveway/Scarboro Driveway
- Redford Place Drive at School Driveway

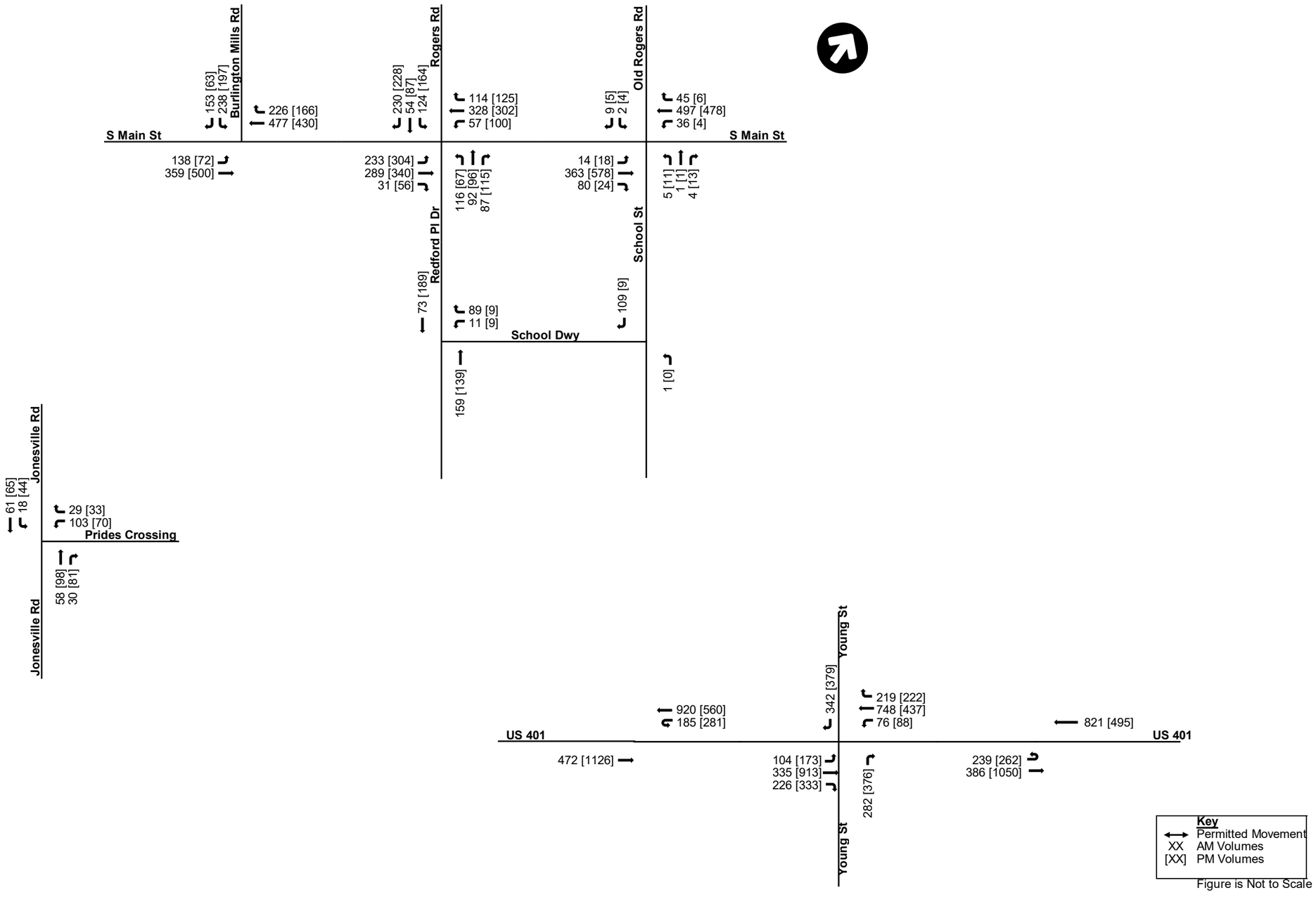
On Thursday, December 8, 2022, AM (7:00 – 9:00 AM) and PM (4:00 – 6:00 PM) turning movement counts were collected at the following intersections:

- Jonesville Road at Prides Crossing
- US 401 at Young Street
- School Street at School Driveway/Scarboro Driveway
- Redford Place Drive at School Driveway

The count data provided by Quality Counts, LLC is included in the Appendix.

Traffic volumes were not balanced due to the high-volume driveways and/or long distances between study intersections. The Existing (2022) traffic volumes are shown in Figure 9.

Figure 9: 2022 Existing Traffic Volumes



5.0 CAPACITY ANALYSIS

Capacity analyses were performed for the roadway network in the study area. The traffic analysis program Synchro Version 11 and SIDRA Intersection 9 was used to analyze all signalized and stop-controlled intersections according to methods put forth by the Transportation Research Board's Highway Capacity Manual[4] (HCM). The HCM defines capacity as the "maximum rate or flow at which persons or vehicles can be reasonably expected to traverse a point or uniform section of a line or roadway during a specified period under prevailing roadway, traffic, and control conditions, usually expressed as vehicles per lane per hour."

Level of service (LOS) is a term used to describe different traffic conditions and is defined as a "qualitative measure describing operational conditions within a traffic stream, and their perception by motorists or passengers." LOS varies from Level A, representing free flow, to Level F where traffic breakdown conditions are evident. At an unsignalized intersection, the primary traffic on the main roadway is virtually uninterrupted. Therefore, the overall delay for the intersection is usually less than what is calculated for minor street movements. The overall intersection delay and the delay for the intersections' minor movement(s) are reported in the summary tables of this report. LOS D is acceptable for signalized intersections in suburban areas during peak periods. For unsignalized intersections, it is common for some of the minor street movements or approaches to be operating at LOS F during peak hour conditions and that is not necessarily indicative of an area that requires improvements.

Capacity analyses were completed following *NCDOT Capacity Analysis Guidelines*[5] as well as the *Draft NCDOT Capacity Analysis Guidelines Best Practices*[6]. Table 3 presents the criteria of each LOS as indicated in the HCM. It should be noted that at the US 401 & Young Street U-turn intersections, Synchro did not allow the use of DP.P phasing for the flashing yellow arrow phases. As a result, protected + permitted phasing was used instead.

Table 3: Level of Service Criteria

Level of Service (LOS)	Signalized Intersection Control Delay (seconds/vehicle)	Unsignalized Intersection Control Delay (seconds/vehicle)
A	≤ 10	≤ 10
B	>10 and ≤ 20	>10 and ≤ 15
C	>20 and ≤ 35	>15 and ≤ 25
D	>35 and ≤ 55	>25 and ≤ 35
E	>55 and ≤ 80	>35 and ≤ 50
F	>80	>50

The Town of Rolesville's Land Development Ordinance (LDO)[7], Section 8.E, establishes the following Level of Service Standards:

3. *The traffic impact analysis must demonstrate that the proposed development would not cause build-out-year, peak-hour levels of service on any arterial or collector road or intersection within the study area to fall below Level of Service (LOS) "D," as defined by the latest edition of the Highway*

Capacity Manual, or, where the existing level of service is already LOS "E" that the proposed development would not cause the LOS to fall to the next lower letter grade.

4. *If the road segment or intersection is already LOS "F," the traffic impact analysis must demonstrate that the proposed development, with any proposed improvements, would not cause build-out year peak-hour operation to degrade more than five (5) percent of the total delay on any intersection approach.*

Peak hour factors for all analysis scenarios were set to 0.9 with one exception; all movements into and out of Rolesville Elementary School utilize a peak hour factor of 0.5 per NCDOT Municipal School Transportation Assistance. All Synchro and SIDRA files and detailed printouts can be found in the Appendix.

6.0 EXISTING CAPACITY ANALYSIS (2022)

In the base year of 2022 under the existing geometric conditions, all study intersections and approaches operate at an acceptable LOS. The results from the 2022 existing analysis are shown in Table 4.

Table 4: 2022 Existing Level of Service and Delay

Intersection		Approach	Lane Group	Delay (sec./veh.)		Level of Service (LOS)		95th % Queue (feet)		Max. Obs. Queue (feet)	
				AM	PM	AM	PM	AM	PM	AM	PM
STOP	Jonesville Road at Prides Crossing	WB	LR	10.3	11.1	B	B	15	15	75	74
		SB	L	7.4	7.7	A	A	0	3	17	42
	South Main Street at Burlington Mills Road	Overall		22.2	18.0	C	B				
		EB	L	55.3	54.4	E	D	90	55	140	103
			T	6.9	6.7	A	A	170	232	109	221
		WB	T	14.1	11.7	B	B	392	361	198	249
			R	1.9	1.0	A	A	61	10	256	136
		SB	L	56.9	57.8	E	E	266	230	302	267
			R	29.9	30.2	C	C	136	70	199	109
	Redford Place Drive/Rogers Road at South Main Street (US 401 Business)	Overall		26.7	27.0	C	C				
		EB	L	9.4	8.0	A	A	90	109	228	201
			TR	15.7	11.6	B	B	265	211	235	264
		WB	L	9.8	9.4	A	A	39	57	156	113
			T	25.4	21.2	C	C	320	273	294	249
			R	7.5	7.1	A	A	45	48	98	95
		NB	L	40.6	40.1	D	D	125	83	180	116
			T	70.5	70.9	E	E	133	137	172	171
			R	23.6	38.7	C	D	66	109	130	179
		SB	L	43.7	63.2	D	E	134	182	172	208
			T	54.5	60.4	D	E	85	127	114	177
			R	36.2	38.2	D	D	158	171	249	260
STOP	Old Rogers Road/School Street at South Main Street (US 401 Business)	NB	LTR	22.5	27.8	C	D	5	15	26	37
		EB	L	8.8	8.6	A	A	0	3	20	20
		WB	L	8.5	9.0	A	A	3	0	40	24
		SB	LTR	21.1	28.7	C	D	8	8	35	30
STOP	Redford Place Drive at School Driveway	WB	LR	10.5	9.7	B	A	23	3	82	36
	US 401 at Young Street (North)	Overall		8.0	9.9	A	A				
		WB	T	3.7	5.3	A	A	258	53	144	100
			R	3.6	6.1	A	A	67	60	0	23
		EB	L	0.1	0.1	A	A	0	0	108	136
		SB	R	22.8	22.0	C	C	98	103	147	147
	US 401 at Young Street (South)	Overall		9.1	8.1	A	A				
		EB	T	2.8	4.0	A	A	40	47	91	177
			R	3.7	4.3	A	A	65	40	0	32
		NB	R	23.3	23.0	C	C	85	108	177	193
		WB	L	0	0.1	A	A	0	0	99	102
	US 401 Eastern U-Turn	Overall		2.8	11.8	A	B				
		WB	T	3.5	7.3	A	A	67	88	91	111
		EB	U	0.2	20.5	A	C	0	125	110	179
	US 401 Western U-Turn	Overall		2.0	4.2	A	A				
		EB	T	2.7	5.2	A	A	34	124	32	150
		WB	U	0.1	0.2	A	A	0	0	89	175

7.0 TRAFFIC VOLUMES: 2028 NO-BUILD & BUILD

The development is anticipated to be constructed in 2028. The following traffic volume calculations focus on the traffic conditions projected in 2028. All traffic volume calculations can be found in the Appendix.

7.1 BACKGROUND TRAFFIC GROWTH

Background traffic growth is the increase in traffic volumes due to usage increases and non-specific growth throughout the area. The 2022 existing volumes were grown by a 2.0 percent annual rate to estimate the 2028 volumes. The growth in vehicles as a result of this future traffic growth is shown in Figure 10.

7.2 ADJACENT DEVELOPMENT TRAFFIC

There are nine (9) developments proposed to be constructed within and nearby the study area: Cobblestone, Kalas Falls, Redford Place, Rolesville Crossing, Scarboro Property, The Point, The Preserve at Moody Farm, Tucker-Wilkins, and Wallbrook. It should be noted that due to their location south of US 401, the associated trips for the Kalas Farms, Rolesville Crossing, The Point, The Preserve at Moody Farm, and Tucker-Wilkins developments were only applied to the US 401 & Young Street intersection. The total trips associated with these developments are shown in

Figure 11. The following subsections highlight salient data for each of the approved developments.

7.2.1 Cobblestone

Cobblestone is a mixed-use development proposed in the northwest quadrant of the intersection of South Main Street & Young Street. The proposed development is expected to consist of 180 apartments, 18,200 square feet of municipal flex space, and 50,000 square feet of retail space. It is estimated to be built by 2023. The trips attributed to the Cobblestone adjacent development, as well as a copy of the traffic study prepared by Ramey Kemp & Associates is provided in the Appendix.

7.2.2 Kalas Falls

Kalas Falls is a residential development on the west side of Rolesville Road just north of Mitchell Mill Road. It is anticipated to consist of 487 single-family homes and 108 townhomes. No improvements to study area intersections are expected as a part of Kalas Falls. A figure illustrating the trips attributed to Kalas Falls, as well as a copy of the traffic study prepared by Stantec, can be found in the Appendix.

7.2.3 Redford Place

Redford Place is a proposed 3-story, 19,500 square foot, mixed-use building with the top two stories being a medical/dental office and the ground-floor consisting of retail uses. The development is located on the east side of Redford Place Drive south of South Main Street and is estimated to be built out by 2023. The trips attributed to the Redford Place development, as well as a copy of the traffic study prepared by Stantec, can be found in the Appendix.

As part of the Redford Place development, the storage of the northbound left-turn lane at the South Main Street & Rogers Road development will be reduced from 200 feet to 175 feet of full-width storage, to accommodate the installation of a southbound left-turn lane on Redford Place Drive at the Site Driveway.

7.2.4 Rolesville Crossing

Rolesville Crossing is a residential development located in the northeast quadrant of the intersection of Rolesville Road and Mitchell Mill Road. It is anticipated to consist of 233 single-family homes and 125 townhomes. The development is estimated to be built out in 2026. No improvements to study area intersections are expected as a part of Rolesville Crossing. A figure illustrating the trips attributed to Rolesville Crossing, as well as a copy of the traffic study prepared by Ramey Kemp & Associates, can be found in the Appendix.

7.2.5 Scarboro Property

Scarboro Property (aka 201 South Main St.) is a proposed development expected to consist of 240 units of senior adult housing. The development is estimated to be built out by 2023. A figure illustrating the trips attributed to the Scarboro Property, as well as a copy of the traffic study prepared by Ramey Kemp & Associates, can be found in the Appendix. The development will construct a driveway onto School Street at the existing School Street and School Driveway intersection.

7.2.6 The Point

The Point is a planned unit development (PUD) located along Rolesville Road south of US 401. Multiple phases of development were included in the study, however, the analysis presented herein includes the full build-out. When completed, the development is envisioned to consist of 621 single-family homes, 320 townhomes, and 122,800 square feet of commercial space. The development is estimated to be built out by 2025. No improvements to study area intersections are expected as a part of The Point. A figure illustrating the trips attributed to the site, as well as a copy of the traffic study prepared by Kimley-Horn and Associates, can be found in the Appendix.

7.2.7 The Preserve at Moody Farm

The Preserve at Moody Farm is a residential development located along Roseville Road. At full build-out, it is expected to consist of 82 single-family homes and is estimated to be built out by 2026. No improvements to study area intersections are expected as a part of The Preserve at Moody Farm. A figure illustrating the trips attributed to The Preserve at Moody Farm, as well as a copy of the traffic study prepared by Stantec, can be found in the Appendix.

7.2.8 Tucker-Wilkins

The Tucker-Wilkins Property is a residential development located along Roseville Road. At full build-out, it is expected to consist of 27 single-family homes and 64 townhomes and is estimated to be built out by 2026. No improvements to study area intersections are expected as a part of Tucker-Wilkins. A figure illustrating the trips attributed to Tucker-Wilkins, as well as a copy of the traffic study prepared by Stantec, can be found in the Appendix.

7.2.9 Wallbrook

Wallbrook is a proposed mixed-use development project located along South Main Street. The proposed development is expected to consist of 107,000 square feet of office space, 17,000 square feet of restaurants, 143,000 square feet of retail space, and 170 townhomes. The development is estimated to be built out by 2025. The improvements associated with the Wallbrook development are discussed in Section 2.4.2. The trips attributed to the Wallbrook development, as well as a copy of the traffic study prepared by Stantec, can be found in the Appendix.

7.3 NO-BUILD TRAFFIC VOLUMES

The 2028 No-Build traffic volumes consist of the sum of the 2022 Existing traffic volumes, the Background traffic growth, and the adjacent development growth. The 2028 No-Build traffic volumes are shown in Figure 12.

7.4 BUILD TRAFFIC VOLUMES

The 2028 Build traffic volumes include the 2028 No-Build traffic and the proposed development traffic discussed in Section 3.0. The 2028 Build traffic volumes are shown in Figure 13. The 2028 Build traffic volumes without Access C are shown in Figure 14.

Figure 10: Background Traffic Growth

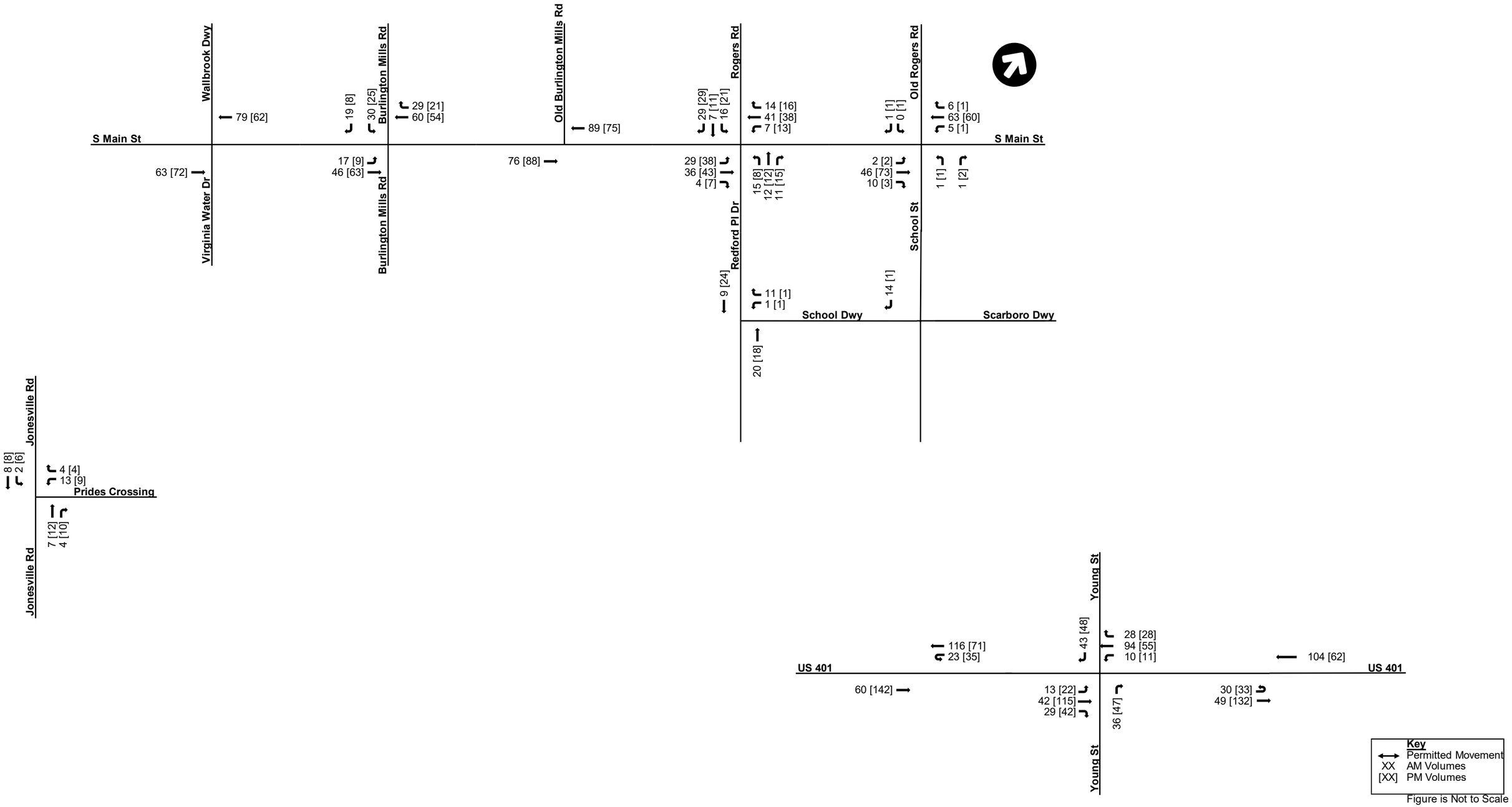


Figure is Not to Scale

Figure 11: Adjacent Development Traffic Volumes

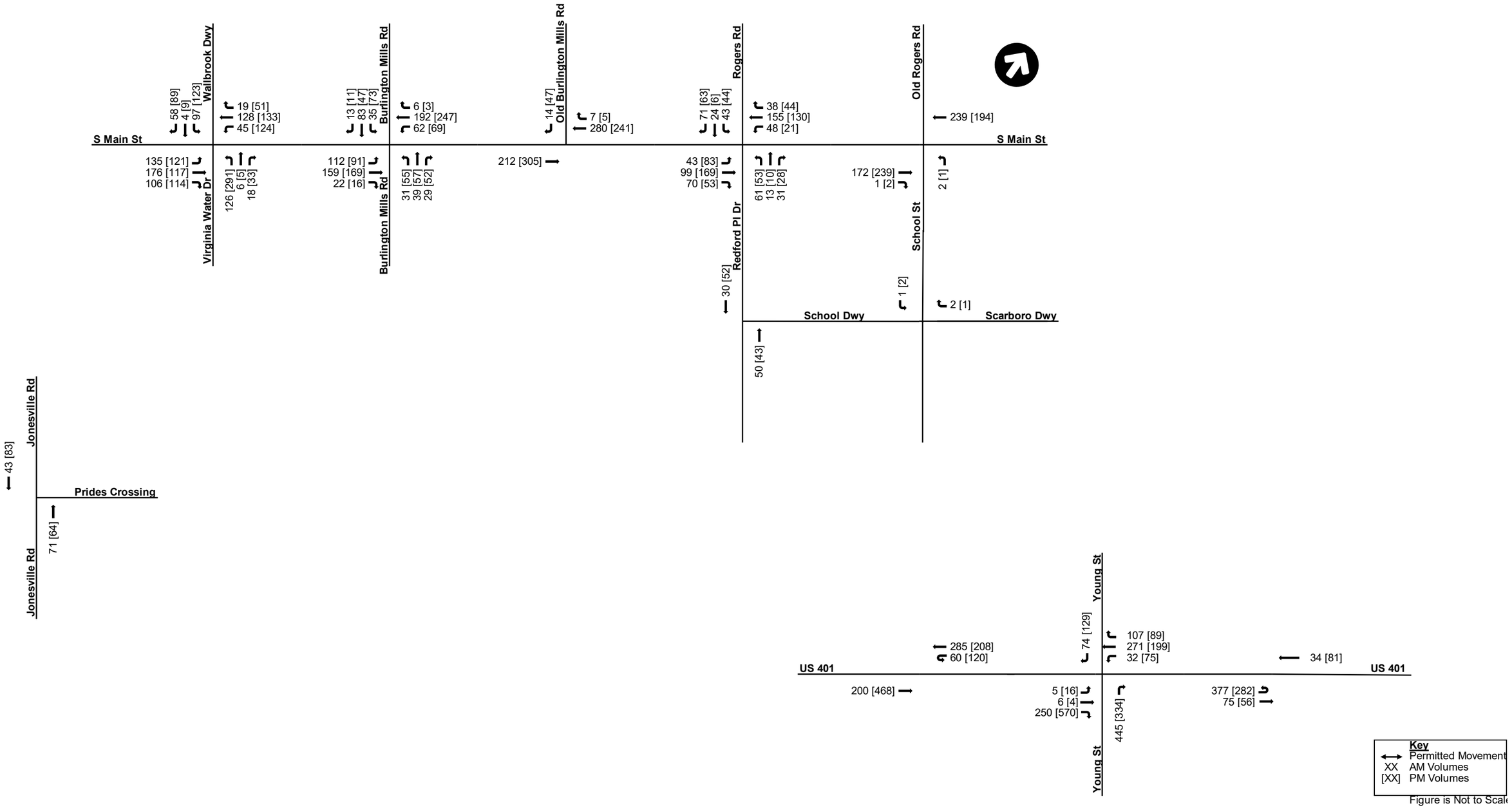


Figure 12: 2028 No-Build Traffic Volumes

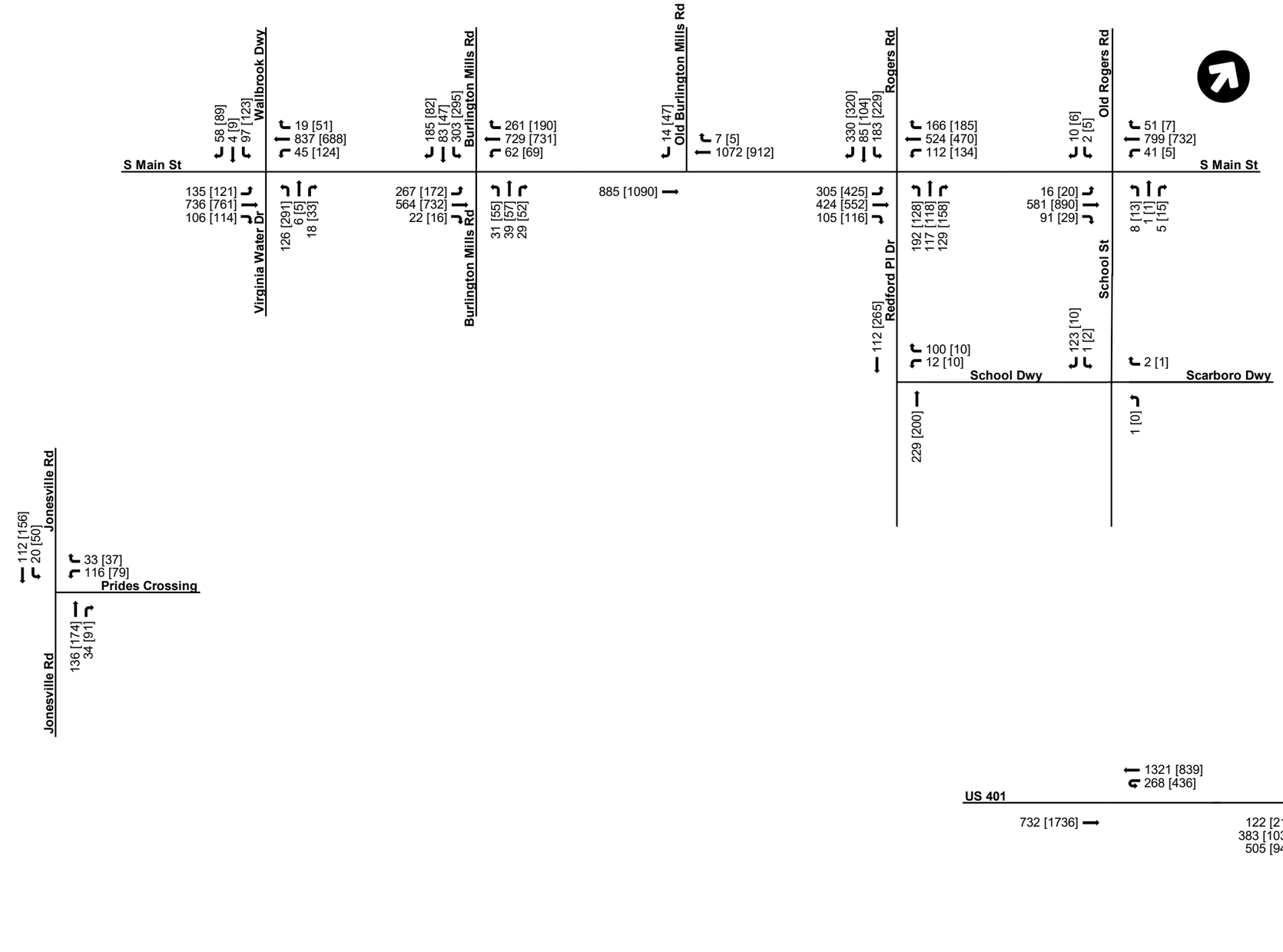


Figure 13: 2028 Build with Access C Traffic Volumes

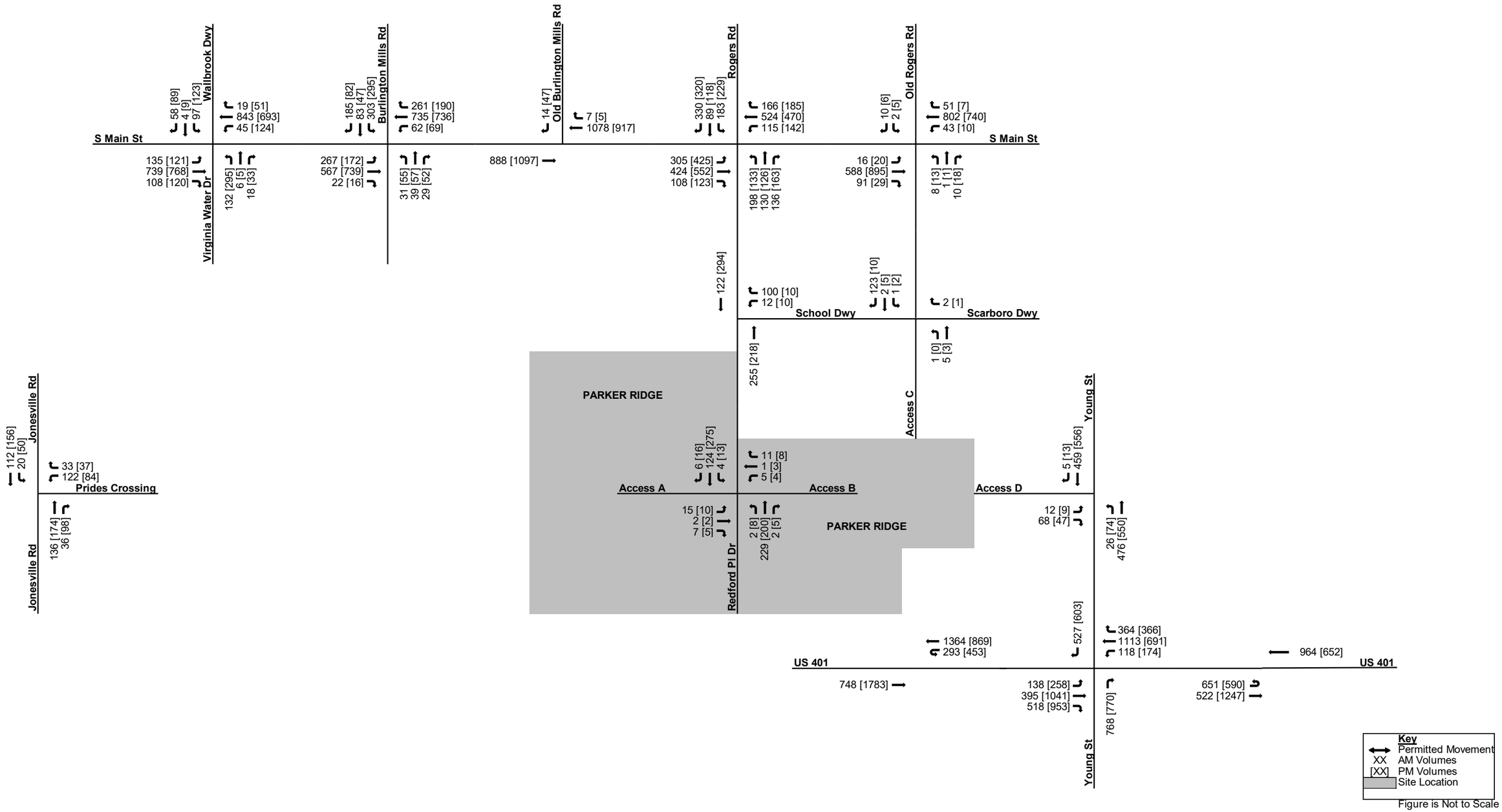
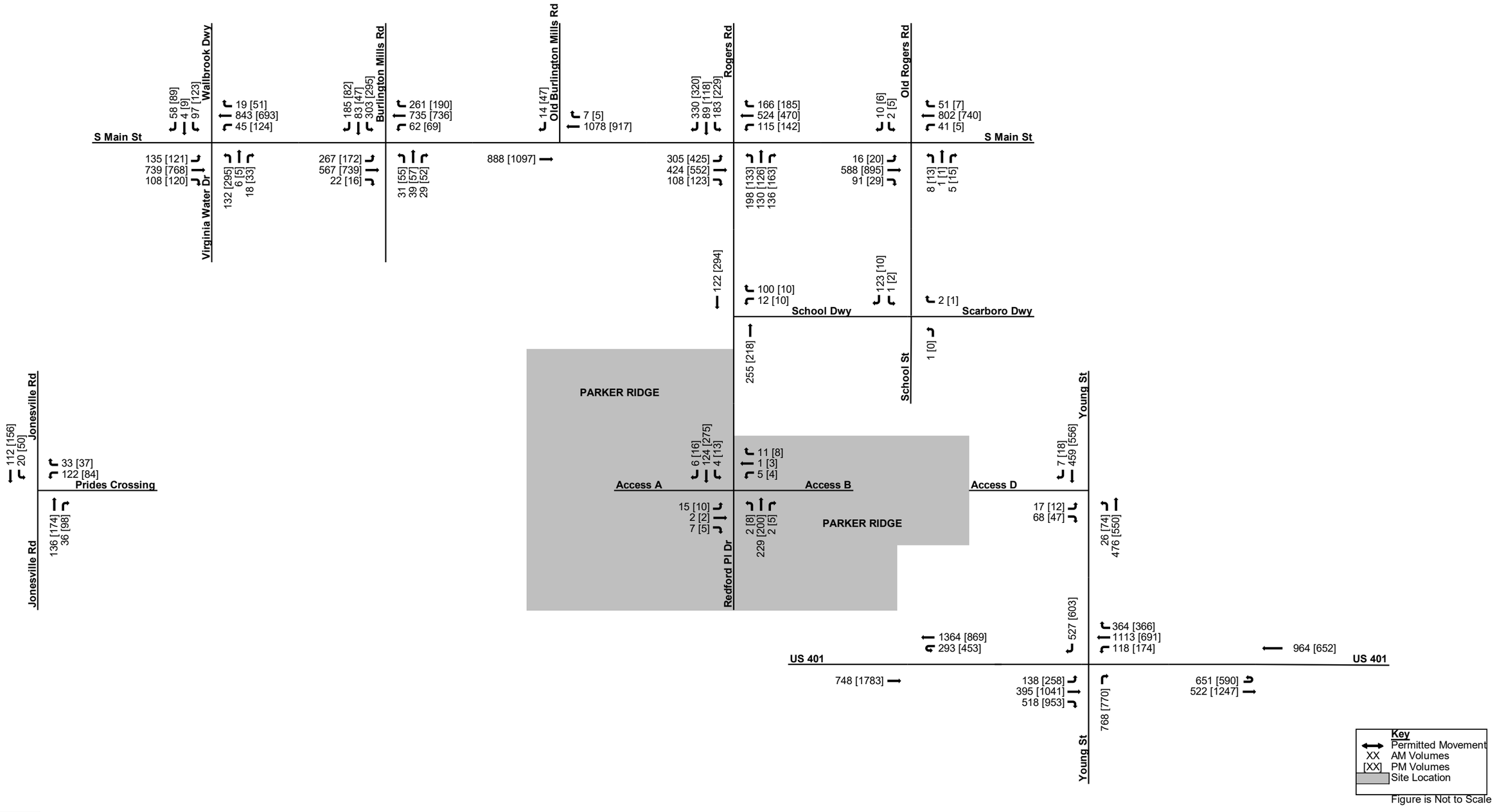


Figure is Not to Scale

Figure 14: 2028 Build without Access C Traffic Volumes



8.0 2028 NO-BUILD

In the 2028 No-Build conditions, the analysis assumes the improvements associated with the adjacent developments and NCDOT projects are constructed. These improvements were discussed in Section 2.4, but are also listed below:

South Main Street at Redford Place Drive/Rogers Road

- Remove the existing westbound dedicated right-turn lane and re-stripe the existing westbound through lane to a shared thru-right turn lane
- Reduce the storage of the northbound left-turn lane from 200 feet to 175 feet of full-width storage

School Street at School Driveway/Scarboro Driveway.

- Construct a stop-controlled westbound approach at the intersection for access to the Scarboro Property development

South Main Street at Realigned Burlington Mills Road

- Construct dual northbound exclusive left-turn lanes with 375 feet of full-width storage and appropriate taper
- Construct an exclusive northbound right-turn lane with 200 feet of full-width storage and appropriate taper
- Construct an exclusive westbound left-turn lane with 100 feet of full-width storage and appropriate taper
- Construct an exclusive westbound right-turn lane with 100 feet of full-width storage and appropriate taper
- Construct an exclusive eastbound left-turn lane with 500 feet of full-width storage and appropriate taper
- Construct an exclusive eastbound right-turn lane with 175 feet of full-width storage and appropriate taper
- Construct an exclusive southbound left-turn lane with 100 feet of full-width storage and appropriate taper
- Construct an exclusive southbound right-turn lane with at least 250 feet of full-width storage and appropriate taper

South Main Street at Virginia Water Drive Extension

- Virginia Water Drive will be extended through the development and intersect South Main Street as a full-movement intersection controlled by a traffic signal. Virginia Water Drive will also be extended to provide access to South Main Street, or the land uses developed as a part of Wallbrook on the west side of South Main Street
- Construct an exclusive northbound left-turn lane with 175 feet of storage and appropriate taper
- Construct an exclusive northbound right-turn lane with 125 feet of full-width storage and appropriate taper
- Construct an exclusive southbound left-turn lane with 350 feet of full-width storage and appropriate taper
- Construct an exclusive southbound right-turn lane with 350 feet of full-width storage and appropriate taper
- Construct an exclusive eastbound left-turn lane with 225 feet of storage and appropriate taper
- Construct an exclusive westbound right-turn lane with 100 feet of full-width storage and appropriate taper

In 2028, the South Main Street & Redford Place Drive/Rogers Road intersection operates at LOS E in both peak hours. It should be noted that the reduction in lanes along South Main Street in conjunction with the U-6241 project resulted in lengthy queues along South Main Street in both peak hours.

The northbound and southbound approaches at the South Main Street & Old Rogers Road/School Street intersection operate at LOS F in both peak hours. It is common for minor street approaches to experience high delays at unsignalized intersections during peak hours. In the AM peak hour, there is an average of 2 vehicles queued for the northbound approach and 1 vehicle queued for the southbound approach. In the PM peak hour, there is an average of 6 vehicles queued for the northbound approach and 3 vehicles queued for the southbound approach. The westbound South Main Street queue from the Rogers Road/Redford Place Drive intersection often extends past this intersection, limiting the gaps available for vehicles wanting to travel westbound on South Main Street.

The following movements operate at LOS F during one or both peak hours:

- South Main Street at Virginia Water Drive Extension: WBL/NBL – both peak hours
- South Main Street at Realigned Burlington Mills Road: WBL – both peak hours, EBL/NBL – AM peak hour, WBT/SBL – PM peak hour
- South Main Street at Redford Place Drive/Rogers Road: EBL/WBL/NBL/NBT/SBL – both peak hours, WBTR – PM peak hour
- US 401 at Young Street: NBR – PM peak hour

Synchro LOS and delay results for the 2028 No-Build analysis scenario are listed in Table 5.

Table 5: 2028 No-Build Level of Service and Delay

Intersection		Approach	Lane Group	Delay (sec./veh.)		Level of Service (LOS)		95th % Queue (feet)		Max. Obs. Queue (feet)	
				AM	PM	AM	PM	AM	PM	AM	PM
STOP	Jonesville Road at Prides Crossing	WB	LR	11.9	13.4	B	B	23	23	83	84
		SB	L	7.6	8.0	C	A	0	3	30	42
	South Main Street at Virginia Water Drive Extension	Overall		29.8	46.3	C	D				
		EB	L	75.5	50.0	E	D	174	186	189	184
			TR	64.7	46.7	E	D	115	147	137	188
		WB	L	93.0	91.8	F	F	232	528	227	566
			TR	59.9	43.3	E	D	57	69	76	200
		NB	L	86.5	105.5	F	F	233	269	275	275
			T	16.1	48.7	B	D	576	1125	965	1111*
			R	8.7	22.5	A	C	63	118	225	225
		SB	L	68.2	70.7	E	E	77	178	449	450
			T	15.5	15.9	B	B	268	174	1000	865
			R	8.0	10.1	A	B	7	14	329	337
	South Main Street at Realigned Burlington Mills Road	Overall		50.0	43.4	D	D				
		EB	L	123.1	75.3	F	E	586	455	449	466
			T	56.7	48.4	E	D	137	81	292	244
			R	40.7	29.8	D	C	212	93	228	137
		WB	L	82.1	92.8	F	F	74	121	90	128
			T	78.7	86.2	E	F	87	121	107	167
			R	28.0	37.2	C	D	40	65	65	110
		NB	L	104.2	72.8	F	E	267	150	474	474
			T	32.9	26.2	C	C	425	1120	859	988
			R	7.6	7.8	A	A	8	5	298	272
		SB	L	59.4	85.1	E	F	78	117	199	199
			T	29.5	42.6	C	D	762	912	1608	1649
			R	3.6	4.0	A	A	59	48	350	350
STOP	South Main Street at Old Burlington Mills Road	SB	R	21.9	20.1	C	C	5	15	46	190
	Redford Place Drive/Rogers Road at South Main Street (US 401 Business)	Overall		62.5	73.3	E	E				
		EB	L	83.7	107.7	F	F	493	774	300	300
			TR	17.6	25.9	B	C	416	560	1098	3695
		WB	L	89.7	107.8	F	F	198	278	275	275
			TR	67.2	90.4	E	F	1065	1118	1617	884
		NB	L	115.3	106.9	F	F	398	265	273	235
			T	88.8	101.6	F	F	206	231	382	256
			R	39.1	46.7	D	D	145	194	203	250
		SB	L	98.6	123.3	F	F	381	503	284	299
			T	74.9	73.9	E	E	156	194	314	603
			R	42.3	30.1	D	C	338	311	354	363
STOP	Old Rogers Road/School Street at South Main Street (US 401 Business)	NB	LTR	158.5	##	F	F	43	153	142	239
		EB	L	10.1	9.6	B	A	3	3	110	122
		WB	L	9.8	12.2	A	B	5	0	205	200
		SB	LTR	103.9	##	F	F	33	83	210	173
STOP	School Street at School Driveway	NB	LTR	7.8	7.3	A	A	0	0	0	0
		WB	LTR	8.9	8.6	A	A	0	0	29	29
		SB	LT	7.2	7.2	A	A	0	0	0	0
STOP	Redford Place Drive at School Driveway	WB	LR	11.6	10.6	B	B	30	5	93	40
	US 401 at Young Street (North)	Overall		9.0	10.5	A	B				
		WB	T	5.5	6.1	A	A	66	58	232	174
			R	4.9	7.5	A	A	49	94	43	104
		EB	L	0.1	0.1	A	A	0	0	115	169
		SB	R	23.2	21.9	C	C	131	150	185	200
	US 401 at Young Street (South)	Overall		17.6	44.2	B	D				
		EB	T	7.3	10.4	A	B	70	281	158	759
			R	16.7	57.6	B	E	271	1135	139	334
		NB	R	26.1	83.7	C	F	233	537	316	373
		WB	L	0.1	0.1	A	A	0	0	81	167
	US 401 Eastern U-Turn	Overall		2.7	3.3	A	A				
		WB	T	4.2	6.0	A	A	100	265	176	135
		EB	U	0.6	0.4	A	A	0	0	432	275
	US 401 Western U-Turn	Overall		2.3	2.9	A	A				
		EB	T	3.1	3.5	A	A	212	187	84	602
		WB	U	0.2	0.4	A	A	0	0	122	579

= Delay exceeds 300 seconds

*Maximum queue extends off the SimTraffic network and may be longer than recorded

9.0 TRAFFIC ANALYSIS: BUILD WITH ACCESS C

9.1 2028 BUILD WITH ACCESS C

In the Build scenario with Access C, the conditions that were noticed in the No-Build scenario remained the same. The South Main Street & Redford Place Drive/Rogers Road intersection still operates at LOS E in both peak hours along with queues at times exceeding 1000' along South Main Street.

The minor northbound and southbound approaches at the South Main Street & Old Rogers Road/School Street intersection operate at LOS F in both peak hours. It is common for minor street approaches to experience high delays at unsignalized intersections during peak hours.

The proposed roundabout at the Redford Place Drive at Access A/Access B intersection operates at LOS A in both peak hours. The School Street/Access C at School Driveway/Scarboro Driveway operates at LOS A in both peak hours. The Young Street at Access D intersection operates at LOS B in the AM peak hour and LOS C in the PM peak hour.

Synchro LOS and delay results for the 2028 Build with Access C scenario are listed in Table 6.

Table 6: 2028 Build with Access C Level of Service and Delay

Intersection		Approach	Lane Group	Delay (sec./veh.)		Level of Service (LOS)		95th % Queue (feet)		Max. Obs. Queue (feet)	
				AM	PM	AM	PM	AM	PM	AM	PM
STOP	Jonesville Road at Prides Crossing	WB	LR	12	13.7	B	B	25	25	90	85
		SB	L	7.6	8	A	A	0	3	30	48
	South Main Street at Virginia Water Drive Extension	Overall		30.2	46.9	C	D				
		EB	L	73.6	49.7	E	D	172	186	180	206
			TR	63.6	46.5	E	D	114	147	117	227
		WB	L	92.6	92.1	F	F	243	541	273	560
			TR	59.0	43.2	E	D	56	69	142	200
		NB	L	86.5	105.5	F	F	233	269	275	275
			T	16.7	49.5	B	D	595	1131	1000	1100*
			R	9.1	22.3	A	C	66	121	225	225
		SB	L	67.4	73.8	E	E	77	181	450	449
			T	16.3	16.4	B	B	269	174	944	886
			R	8.4	10.0	A	B	8	14	286	376
	South Main Street at Realigned Burlington Mills Road	Overall		48.9	43.7	D	D				
		EB	L	123.1	75.3	F	E	586	455	431	464
			T	56.7	48.4	E	D	137	81	318	197
			R	40.9	29.8	D	C	212	93	246	124
		WB	L	82.1	92.8	F	F	74	121	88	129
			T	78.7	86.2	E	F	87	121	136	188
			R	54.0	37.2	D	D	58	65	88	113
		NB	L	108.9	72.5	F	E	267	147	396	474
			T	20.4	26.6	C	C	450	1139	599	912
			R	8.2	7.6	A	A	11	5	220	190
		SB	L	78.5	84.3	E	F	81	117	199	200
			T	31.2	43.4	C	D	770	908	1724	1399
			R	4.0	4	A	A	51	48	350	350
STOP	South Main Street at Old Burlington Mills Road	SB	R	22.1	20.2	C	C	5	18	89	124
	Redford Place Drive/Rogers Road at South Main Street (US 401 Business)	Overall		64.0	73.8	E	E				
		EB	L	82.4	99.2	F	F	484	752	300	300
			TR	19.5	26.7	B	C	432	594	1202	2691
		WB	L	89.6	108.0	F	F	202	294	275	275
			TR	67.8	94.9	E	F	1065	1130	1433	1854*
		NB	L	121.0	107.8	F	F	415	277	274	246
			T	91.5	104.6	F	F	226	256	401	311
			R	38.9	46.0	D	D	152	199	226	312
		SB	L	103.2	127.2	F	F	381	503	269	299
			T	75.8	76.6	E	E	163	216	331	636
			R	42.1	29.4	D	C	338	307	376	446
STOP	Old Rogers Road/School Street at South Main Street (US 401 Business)	NB	LTR	145.6	##	F	F	48	N/A	150	249
		EB	L	10.1	9.6	B	A	3	3	79	149
		WB	L	9.8	12.7	A	B	5	3	188	225
		SB	LTR	122	##	F	F	38	90	149	223
STOP	School Street at School Driveway/Access C	NB	LTR	7.8	7.3	A	A	0	0	0	0
		WB	LTR	8.9	8.6	A	A	0	0	29	29
		SB	LT	7.2	7.2	A	A	0	0	0	0
STOP	Redford Place Drive at School Driveway	WB	LR	11.9	10.8	B	B	33	5	83	44
	Redford Place Drive at Access A/Access B	Overall		3.8	4.2	A	A				
		NB	LTR	4.1	4	A	A	29	26	44	39
		WB	LTR	4	3.8	A	A	3	2	31	13
		SB	LTR	3.4	4.3	A	A	15	37	16	52
		EB	LTR	3.6	4.1	A	A	3	3	22	28
STOP	Young Street at Access D	NB	LT	8.5	9.1	A	A	3	8	79	160
		EB	LR	14.7	21.3	B	C	18	20	62	63
	US 401 at Young Street (North)	Overall		10.2	10.9	B	B				
		WB	T	6.6	6.8	A	A	61	61	255	177
			R	6.0	8.9	A	A	46	137	67	139
		EB	L	0.1	0.1	A	A	0	0	122	177
		SB	R	23.2	21.4	C	C	150	160	191	219
	US 401 at Young Street (South)	Overall		18.0	46.4	B	D				
		EB	T	7.6	10.2	A	B	72	264	176	782
			R	18.0	60.0	B	E	324	1148	155	337
		NB	R	26.3	89.0	C	F	252	551	314	407
		WB	L	0.1	0.1	A	A	0	0	78	159
	US 401 Eastern U-Turn	Overall		2.7	3.6	A	A				
		WB	T	4.2	6.4	A	A	102	116	189	136
		EB	U	0.6	0.4	A	A	0	0	448	292
	US 401 Western U-Turn	Overall		2.3	3.0	A	A				
		EB	T	3.2	3.6	A	A	56	199	83	631
		WB	U	0.2	0.4	A	A	0	0	139	610

= Delay exceeds 300 seconds

*Maximum queue extends off the SimTraffic network and may be longer than recorded

9.2 2028 BUILD IMPROVED WITH ACCESS C

As noted in Section 5.0, the Rolesville LDO requires that any study area intersections that operate at LOS F and where the delay in the Build scenario increases by more than 5% when compared to the No-Build scenario should be investigated for mitigation. With the addition of traffic generated by the proposed development, the northbound School Street and southbound Old Rogers Road approach of the South Main Street at Old Rogers Road/School Street intersection increases in delay by greater than 5%. If high delays are experienced on the stop-controlled approaches, drivers may opt for alternative routes. Even so, the intersection was evaluated for potential improvements to meet the requirements of the Rolesville LDO:

- The installation of a traffic signal would improve the LOS of the side streets significantly. This, however, is not anticipated to be permitted by NCDOT due to the proximity of the intersection to the adjacent signalized intersection of South Main Street at Redford Place Drive/Rogers Road. In addition, the low traffic volumes on the side-street approaches of Old Rogers Road and School Street are not anticipated to meet the warrants for the installation of a traffic signal included in the Manual on Uniform Traffic Control Devices (MUTCD).
- The construction of dedicated left-turn turn lanes on Old Rogers Road and School Street reduces delay but does not mitigate the impact of the proposed development. This is attributed to low volumes of traffic on the side-street approaches and high through volumes on South Main Street. The installation of turn lanes may also impact adjacent property owners. As a result, the installation of turn lanes on Old Rogers Road and School Street is not recommended.
- Converting the southbound approach of Old Rogers Road to right-in/right-out access by installing channelization was shown to reduce delays on the side streets such that School Street is anticipated to operate at LOS C and Old Rogers Road is anticipated to operate at LOS D during the PM peak hour. This would require left turns from Old Rogers Road to be redirected to Rogers Road and use the traffic signal at the intersection of South Main Street at Redford Place Drive/Rogers Road; increasing travel time for existing vehicles on the Old Rogers Road approach. Furthermore, the restriction of access without the installation of a median has only limited effectiveness. As a result, the restriction of access is not recommended.

Therefore, no improvements are recommended at the South Main Street at Old Rogers Road/School Street intersection in conjunction with this development. Consideration should be made for limiting the southbound Old Rogers Road approach to right-in/right-out access in the future.

9.2.1 Proposed Improvements By Others

This study assumes that Access D, from the proposed development to Young Street, is constructed by others. Based on the findings of this study, the following improvements are recommended for this access point:

Young Street at Access D

- Construct Access D as a full-movement access point
- Construct Access D with one ingress lane and one egress lane with 100 feet of internal protective stem
- Provide a northbound left turn lane with 75 feet of full-width storage and appropriate taper

The 2028 Build Improved with Access C capacity analysis results is shown in Table 7.

Table 7: 2028 Build Improved with Access C Level of Service and Delay

Intersection		Approach	Lane Group	Delay (sec./veh.)		Level of Service (LOS)		95th % Queue (feet)		Max. Obs. Queue (feet)	
				AM	PM	AM	PM	AM	PM	AM	PM
STOP	Jonesville Road at Prides Crossing	WB	LR	12	13.7	B	B	25	25	100	81
		SB	L	7.6	8	A	A	0	3	33	51
	South Main Street at Virginia Water Drive Extension	Overall		30.2	46.9	C	D				
		EB	L	73.6	49.7	E	D	172	186	172	234
			TR	63.6	46.5	E	D	114	147	131	272
		WB	L	92.6	92.1	F	F	243	541	252	580
			TR	59.0	43.2	E	D	56	69	107	200
		NB	L	86.5	105.5	F	F	233	269	275	275
			T	16.7	49.5	B	D	595	1131	924	1113*
			R	9.1	22.3	A	C	66	121	225	225
		SB	L	67.4	73.8	E	E	77	181	340	439
			T	16.3	16.4	B	B	269	174	958	702
			R	8.4	10.0	A	B	8	14	368	374
	South Main Street at Realigned Burlington Mills Road	Overall		48.9	43.7	D	D				
		EB	L	123.1	75.3	F	E	586	455	457	504
			T	56.7	48.4	E	D	137	81	309	409*
			R	40.9	29.8	D	C	212	93	233	132
		WB	L	82.1	92.8	F	F	74	121	77	144
			T	78.7	86.2	E	F	87	121	117	270
			R	54.0	37.2	D	D	58	65	78	111
		NB	L	108.9	72.5	F	E	267	147	380	442
			T	20.4	26.6	C	C	450	1139	577	1064
			R	8.2	7.6	A	A	11	5	219	274
		SB	L	78.5	84.3	E	F	81	117	200	199
			T	31.2	43.4	C	D	770	908	2000	1521
			R	4.0	4.0	A	A	51	48	350	350
STOP	South Main Street at Old Burlington Mills Road	SB	R	22.1	20.2	C	C	5	18	128	154
	Redford Place Drive/Rogers Road at South Main Street (US 401 Business)	Overall		64.0	73.8	E	E				
		EB	L	82.4	99.2	F	F	484	752	300	300
			TR	19.5	26.7	B	C	432	594	1113	3737
		WB	L	89.6	108.0	F	F	202	294	275	275
			TR	67.8	94.9	E	F	1065	1130	1373	1855*
		NB	L	121.0	107.8	F	F	415	277	268	250
			T	91.5	104.6	F	F	226	256	396	293
			R	38.9	46.0	D	D	152	199	180	400
		SB	L	103.2	127.2	F	F	381	503	281	300
			T	75.8	76.6	E	E	163	216	282	820*
			R	42.1	29.4	D	C	338	307	364	447
STOP	Old Rogers Road/School Street at South Main Street (US 401 Business)	NB	LTR	145.6	##	F	F	48	N/A	102	289
		EB	L	10.1	9.6	B	A	3	3	57	163
		WB	L	9.8	12.7	A	B	5	3	207	151
		SB	LTR	122	##	F	F	38	90	100	266
STOP	School Street at School Driveway/Access C	NB	LTR	7.8	7.3	A	A	0	0	0	0
		WB	LTR	8.9	8.6	A	A	0	0	29	29
		SB	LT	7.2	7.2	A	A	0	0	0	3
STOP	Redford Place Drive at School Driveway	WB	LR	11.9	10.8	B	B	33	5	89	49
	Redford Place Drive at Access A/Access B	Overall		3.8	4.2	A	A				
		NB	LTR	4.1	4	A	A	29	26	43	33
		WB	LTR	4	3.8	A	A	3	2	28	23
		SB	LTR	3.4	4.3	A	A	15	37	9	60
		EB	LTR	3.6	4.1	A	A	3	3	30	26
STOP	Young Street at Access D	NB	L	8.5	9.1	A	A	3	8	44	64
		EB	LR	14.7	20.7	B	C	18	20	64	70
	US 401 at Young Street (North)	Overall		10.2	10.9	B	B				
		WB	T	6.6	6.8	A	A	61	61	251	187
			R	6.0	8.9	A	A	46	137	92	146
		EB	L	0.1	0.1	A	A	0	0	137	171
		SB	R	23.2	21.4	C	C	150	160	165	224
	US 401 at Young Street (South)	Overall		18.0	46.4	B	D				
		EB	T	7.6	10.2	A	B	72	264	170	751
			R	18.0	60.0	B	E	324	1148	138	338
		NB	R	26.3	89.0	C	F	252	551	310	379
		WB	L	0.1	0.1	A	A	0	0	76	175
	US 401 Eastern U-Turn	Overall		2.7	3.6	A	A				
		WB	T	4.2	6.4	A	A	102	116	193	133
		EB	U	0.6	0.4	A	A	0	0	433	367
	US 401 Western U-Turn	Overall		2.3	3.0	A	A				
		EB	T	3.2	3.6	A	A	56	199	72	608
		WB	U	0.2	0.4	A	A	0	0	132	607

= Delay exceeds 300 seconds
*Maximum queue extends off the SimTraffic network and may be longer than recorded

10.0 TRAFFIC ANALYSIS: BUILD WITHOUT ACCESS C

10.1 2028 BUILD WITHOUT ACCESS C

In the Build scenario without Access C, the conditions that were noticed in the No-Build scenario remained the same. The South Main Street & Redford Place Drive/Rogers Road intersection still is expected to operate at LOS E in both peak hours along with queues at times exceeding 1000' along South Main Street.

The minor northbound and southbound approaches at the South Main Street & Old Rogers Road/School Street intersection operate at LOS F in both peak hours. It is common for minor street approaches to experience high delays at unsignalized intersections during peak hours.

The proposed roundabout at the Redford Place Drive at Access A/Access B intersection operates at LOS A in both peak hours. The School Street/Access C at School Driveway/Scarboro Driveway intersection operates at LOS A in both peak hours. The Young Street at Access D intersection operates at LOS C in both peak hours.

Synchro LOS and delay results for the 2028 Build without Access C analysis scenario are listed in Table 8.

Table 8: 2028 Build without Access C Level of Service and Delay

Intersection		Approach	Lane Group	Delay (sec./veh.)		Level of Service (LOS)		95th % Queue (feet)		Max. Obs. Queue (feet)	
				AM	PM	AM	PM	AM	PM	AM	PM
STOP	Jonesville Road at Prides Crossing	WB	LR	12	13.7	B	B	25	25	90	98
		SB	L	7.6	8	A	A	0	3	30	37
	South Main Street at Virginia Water Drive Extension	Overall		30.2	46.9	C	D				
		EB	L	73.6	49.7	E	D	172	186	197	201
			TR	63.6	46.5	E	D	114	147	120	175
		WB	L	92.6	92.1	F	F	243	541	278	543
			TR	59.0	43.2	E	D	56	69	142	200
		NB	L	86.5	105.5	F	F	233	269	274	275
			T	16.7	49.5	B	D	595	1131	966	1110*
			R	9.1	22.3	A	C	66	121	225	225
		SB	L	67.4	73.8	E	E	77	181	449	449
			T	16.3	16.4	B	B	269	174	961	830
			R	8.4	10.0	A	B	8	14	253	450
	South Main Street at Realigned Burlington Mills Road	Overall		48.9	43.7	D	D				
		EB	L	123.1	75.3	F	E	586	455	475	451
			T	56.7	48.4	E	D	137	81	332	144
			R	40.9	29.8	D	C	212	93	199	135
		WB	L	82.1	92.8	F	F	74	121	86	138
			T	78.7	86.2	E	F	87	121	119	172
			R	54.0	37.2	D	D	58	65	72	128
		NB	L	108.9	72.5	F	E	267	147	373	475
			T	20.4	26.6	C	C	450	1139	569	1067
			R	8.2	7.6	A	A	11	5	214	300
		SB	L	78.5	84.3	E	F	81	117	199	200
			T	31.2	43.4	C	D	770	908	1750	1876
			R	4.0	4.0	A	A	51	48	350	350
STOP	South Main Street at Old Burlington Mills Road	SB	R	22.1	20.2	C	C	5	18	94	225
	Redford Place Drive/Rogers Road at South Main Street (US 401 Business)	Overall		64.0	73.8	E	E				
		EB	L	82.4	99.2	F	F	484	752	300	300
			TR	19.5	26.7	B	C	432	594	1271	3389
		WB	L	89.6	108.0	F	F	202	294	275	275
			TR	67.8	94.9	E	F	1065	1130	1564	1607
		NB	L	121.0	107.8	F	F	415	277	270	261
			T	91.5	104.6	F	F	226	256	387	273
			R	38.9	46.0	D	D	152	199	227	222
		SB	L	103.2	127.2	F	F	381	503	283	300
			T	75.8	76.6	E	E	163	216	365	532
			R	42.1	29.4	D	C	338	307	408	314
STOP	Old Rogers Road/School Street at South Main Street (US 401 Business)	NB	LTR	177.9	##	F	F	45	158	114	200
		EB	L	10.1	9.6	B	A	3	3	88	95
		WB	L	9.8	12.6	A	B	5	0	159	148
		SB	LTR	115.3	##	F	F	35	88	144	131
STOP	School Street at School Driveway/Access C	NB	LTR	7.8	7.3	A	A	0	0	0	0
		WB	LTR	8.9	8.6	A	A	0	0	29	29
		SB	LT	7.2	7.2	A	A	0	0	0	2
STOP	Redford Place Drive at School Driveway	WB	LR	11.9	10.8	B	B	33	5	80	34
	Redford Place Drive at Access A/Access B	Overall		3.8	4.2	A	A				
		NB	LTR	4.1	4	A	A	29	26	45	17
		WB	LTR	4	3.8	A	A	3	2	31	23
		SB	LTR	3.4	4.3	A	A	15	37	20	52
		EB	LTR	3.6	4.1	A	A	3	3	27	27
STOP	Young Street at Access D	NB	LT	8.5	9.2	A	A	3	8	85	156
		EB	LR	15.7	24.0	C	C	20	25	67	68
	US 401 at Young Street (North)	Overall		10.2	10.9	B	B				
		WB	T	6.6	6.8	A	A	61	61	254	166
			R	6.0	8.9	A	A	46	137	140	134
		EB	L	0.1	0.1	A	A	0	0	120	168
		SB	R	23.2	21.4	C	C	150	160	191	194
	US 401 at Young Street (South)	Overall		18.0	46.4	B	D				
		EB	T	7.6	10.2	A	B	72	264	158	764
			R	18.0	60.0	B	E	324	1148	140	336
		NB	R	26.3	89.0	C	F	252	551	324	378
		WB	L	0.1	0.1	A	A	0	0	94	152
	US 401 Eastern U-Turn	Overall		2.7	3.6	A	A				
		WB	T	4.2	6.4	A	A	102	116	185	149
		EB	U	0.6	0.4	A	A	0	0	466	318
	US 401 Western U-Turn	Overall		2.3	3.0	A	A				
		EB	T	3.2	3.6	A	A	56	199	69	536
		WB	U	0.2	0.4	A	A	0	0	126	582

= Delay exceeds 300 seconds

*Maximum queue extends off the SimTraffic network and may be longer than recorded

10.2 2028 BUILD IMPROVED WITHOUT ACCESS C

As noted in Section 5.0, the Rolesville LDO requires that any study area intersections that operate at LOS F and where the delay in the Build scenario increases by more than 5% when compared to the No-Build scenario should be investigated for mitigation. With the addition of traffic generated by the proposed development, the northbound School Street and southbound Old Rogers Road approach of the South Main Street at Old Rogers Road/School Street intersection increases in delay by greater than 5%. If high delays are experienced on the stop-controlled approaches, drivers may opt for alternative routes. Even so, the intersection was evaluated for potential improvements to meet the requirements of the Rolesville LDO:

- The installation of a traffic signal would improve the LOS of the side streets significantly. This, however, is not anticipated to be permitted by NCDOT due to the proximity of the intersection to the adjacent signalized intersection of South Main Street at Redford Place Drive/Rogers Road. In addition, the low traffic volumes on the side-street approaches of Old Rogers Road and School Street are not anticipated to meet the warrants for the installation of a traffic signal included in the Manual on Uniform Traffic Control Devices (MUTCD).
- The construction of dedicated left-turn turn lanes on Old Rogers Road and School Street reduces delay but does not mitigate the impact of the proposed development. This is attributed to low volumes of traffic on the side-street approaches and high through volumes on South Main Street. The installation of turn lanes may also impact adjacent property owners. As a result, the installation of turn lanes on Old Rogers Road and School Street is not recommended.
- Converting the southbound approach of Old Rogers Road to right-in/right-out access by installing channelization was shown to reduce delays on the side streets such that School Street is anticipated to operate at LOS C and Old Rogers Road is anticipated to operate at LOS D during the PM peak hour. This would require left turns from Old Rogers Road to be redirected to Rogers Road and use the traffic signal at the intersection of South Main Street at Redford Place Drive/Rogers Road; increasing travel time for existing vehicles on the Old Rogers Road approach. Furthermore, the restriction of access without the installation of a median has only limited effectiveness. As a result, the restriction of access is not recommended.

Therefore, no improvements are recommended at the South Main Street at Old Rogers Road/School Street intersection in conjunction with this development. Consideration should be made for limiting the southbound Old Rogers Road approach to right-in/right-out access in the future.

10.2.1 Proposed Improvements By Others

This study assumes that Access D, from the proposed development to Young Street, is constructed by others. Based on the findings of this study, the following improvements are recommended for this access point:

Young Street at Access D

- Construct Access D as a full-movement access point
- Construct Access D with one ingress lane and one egress lane with 100 feet of internal protective stem
- Provide a northbound left turn lane with 75 feet of full-width storage and appropriate taper

The Build Improved capacity analysis results are shown in Table 9.

Table 9: 2028 Build Improved without Access C Level of Service and Delay

Intersection		Approach	Lane Group	Delay (sec./veh.)		Level of Service (LOS)		95th % Queue (feet)		Max. Obs. Queue (feet)	
				AM	PM	AM	PM	AM	PM	AM	PM
STOP	Jonesville Road at Prides Crossing	WB	LR	12	13.7	B	B	25	25	103	80
		SB	L	7.6	8	A	A	0	3	30	38
	South Main Street at Virginia Water Drive Extension	Overall		30.2	46.9	C	D				
		EB	L	73.6	49.7	E	D	172	186	198	199
			TR	63.6	46.5	E	D	114	147	166	217
		WB	L	92.6	92.1	F	F	243	541	244	526
			TR	59.0	43.2	E	D	56	69	106	200
		NB	L	86.5	105.5	F	F	233	269	274	275
			T	16.7	49.5	B	D	595	1131	997	1114*
			R	9.1	22.3	A	C	66	121	225	225
		SB	L	67.4	73.8	E	E	77	181	449	432
			T	16.3	16.4	B	B	269	174	876	787
			R	8.4	10.0	A	B	8	14	286	374
	South Main Street at Realigned Burlington Mills Road	Overall		48.9	43.7	D	D				
		EB	L	123.1	75.3	F	E	586	455	495	449
			T	56.7	48.4	E	D	137	81	382	209
			R	40.9	29.8	D	C	212	93	215	134
		WB	L	82.1	92.8	F	F	74	121	87	130
			T	78.7	86.2	E	F	87	121	111	179
			R	54.0	37.2	D	D	58	65	88	105
		NB	L	108.9	72.5	F	E	267	147	444	475
			T	20.4	26.6	C	C	450	1139	665	1006
			R	8.2	7.6	A	A	11	5	136	300
		SB	L	78.5	84.3	E	F	81	117	199	200
			T	31.2	43.4	C	D	770	908	1849	1527
			R	4.0	4.0	A	A	51	48	350	350
STOP	South Main Street at Old Burlington Mills Road	SB	R	22.1	20.2	C	C	5	18	85	185
	Redford Place Drive/Rogers Road at South Main Street (US 401 Business)	Overall		64.0	73.8	E	E				
		EB	L	82.4	99.2	F	F	484	752	300	300
			TR	19.5	26.7	B	C	432	594	1487	3730
		WB	L	89.6	108.0	F	F	202	294	275	275
			TR	67.8	94.9	E	F	1065	1130	1387	1827*
		NB	L	121.0	107.8	F	F	415	277	273	268
			T	91.5	104.6	F	F	226	256	428	322
			R	38.9	46.0	D	D	152	199	231	298
		SB	L	103.2	127.2	F	F	381	503	292	296
			T	75.8	76.6	E	E	163	216	413	595
			R	42.1	29.4	D	C	338	307	450	308
STOP	Old Rogers Road/School Street at South Main Street (US 401 Business)	NB	LTR	177.9	##	F	F	45	158	142	276
		EB	L	10.1	9.6	B	A	3	3	87	131
		WB	L	9.8	12.6	A	B	5	0	161	200
		SB	LTR	115.3	##	F	F	35	88	136	254
STOP	School Street at School Driveway/Access C	NB	LTR	7.8	7.3	A	A	0	0	0	0
		WB	LTR	8.9	8.6	A	A	0	0	29	31
		SB	LT	7.2	7.2	A	A	0	0	3	0
STOP	Redford Place Drive at School Driveway	WB	LR	11.9	10.8	B	B	33	5	102	42
	Redford Place Drive at Access A/Access B	Overall		3.8	4.2	A	A				
		NB	LTR	4.1	4	A	A	29	26	40	36
		WB	LTR	4	3.8	A	A	3	2	35	23
		SB	LTR	3.4	4.3	A	A	15	37	26	47
		EB	LTR	3.6	4.1	A	A	3	3	28	29
STOP	Young Street at Access D	NB	L	8.5	9.2	A	A	3	8	38	58
		EB	LR	15.6	23.4	C	C	20	25	62	58
	US 401 at Young Street (North)	Overall		10.2	10.9	B	B				
		WB	T	6.6	6.8	A	A	61	61	242	195
			R	6.0	8.9	A	A	46	137	104	154
		EB	L	0.1	0.1	A	A	0	0	116	179
		SB	R	23.2	21.4	C	C	150	160	189	230
	US 401 at Young Street (South)	Overall		18.0	46.4	B	D				
		EB	T	7.6	10.2	A	B	72	264	157	760
			R	18.0	60.0	B	E	324	1148	122	332
		NB	R	26.3	89.0	C	F	252	551	351	372
		WB	L	0.1	0.1	A	A	0	0	78	159
	US 401 Eastern U-Turn	Overall		2.7	3.6	A	A				
		WB	T	4.2	6.4	A	A	102	116	194	138
		EB	U	0.6	0.4	A	A	0	0	445	267
	US 401 Western U-Turn	Overall		2.3	3.0	A	A				
		EB	T	3.2	3.6	A	A	56	199	88	595
		WB	U	0.2	0.4	A	A	0	0	142	591

= Delay exceeds 300 seconds

*Maximum queue extends off the SimTraffic network and may be longer than recorded

11.0 COMPREHENSIVE RECOMMENDATIONS

Based on the findings of this study, specific improvements have been identified and some should be completed as part of the proposed development. These improvements are valid for both scenarios with and without Access C.

Jonesville Road at Prides Crossing

- No improvements are recommended at this intersection

South Main Street at Realigned Burlington Mills Road

- No improvements are recommended at this intersection

Redford Place Drive/Rogers Road at South Main Street

- No improvements are recommended at this intersection

Old Rogers Road/School Street at South Main Street

- No improvements are recommended at this intersection

School Street at School Driveway/Scarboro Driveway/Access C

- If Access C is constructed, the driveway should be constructed with one ingress lane and one egress lane with 100 feet of internal protective stem
- If Access C is not pursued, it is recommended that the connection be removed from the Town's Community Transportation Plan (CTP)

Redford Place at School Driveway

- No improvements are recommended at this intersection

US 401 at Young Street

- No improvements are recommended at this intersection

US 401 WB U-Turn

- No improvements are recommended at this intersection

US 401 EB U-Turn

- No improvements are recommended at this intersection

South Main Street at Virginia Water Drive Extension

- No improvements are recommended at this intersection

Redford Place Drive at Access A/Access B

- Construct Access A and Access B with one ingress lane and one egress lane at the existing roundabout along Redford Place Drive south of the School Driveway intersection. Both intersections should have a minimum internal protective stem of 100 feet

Young Street at Access D

It is recommended that Access D be constructed by others as a full-movement access point, with one ingress lane and one egress lane with 100 feet of internal protective stem. A northbound left turn lane should be provided in conjunction with construction of the access point with 75 feet of full-width storage and appropriate taper.

These recommendations are illustrated in Figure ES-1.

Figure 15: Recommended Improvements

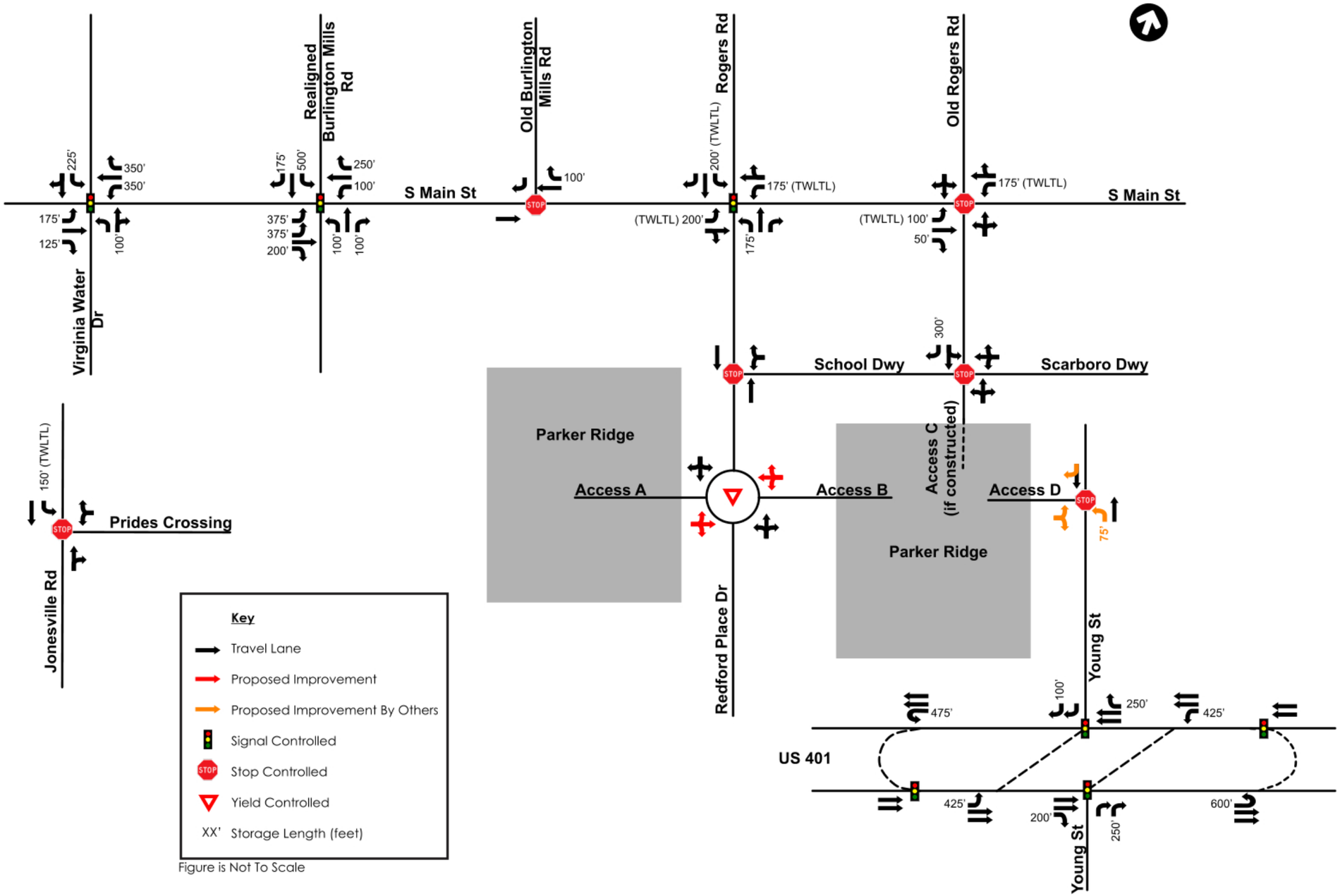


Figure is Not To Scale

12.0 REFERENCES

[1] ***NCDOT Functional Classification Map***,
http://ncdot.maps.arcgis.com/home/webmap/viewer.html?layers=029a9a9fe26e43d687d30cd3c08b1792

[2] ***2020 NCDOT Average Daily Traffic Volumes***,
https://ncdot.maps.arcgis.com/apps/webappviewer/index.html?id=964881960f0549de8c3583bf46ef5ed4

[3] ***Trip Generation (11th Edition)***, Institute of Transportation Engineers (ITE), September 2021.

[4] ***Highway Capacity Manual 6th Edition: A Guide for Multimodal Mobility Analysis***. Washington D.C.: Transportation Research Board, 2016.

[5] ***NCDOT Capacity Analysis Guidelines***. North Carolina Department of Transportation (NCDOT), March 2022, https://connect.ncdot.gov/resources/safety/Congestion%20Mngmt%20and%20Signing/Standards%20-%20Capacity%20Analysis%20Guidelines.pdf

[6] ***Draft NCDOT Capacity Analysis Guidelines: Best Practices.*** North Carolina Department of Transportation (NCDOT), March 2022, https://connect.ncdot.gov/resources/safety/Congestion%20Mngmt%20and%20Signing/Best%20Practices%20-%20Capacity%20Analysis%20Guidelines.pdf

[7] ***Land Development Ordinance***. Town of Rolesville, June 1, 2021, https://www.rolesvillenc.gov/code-ordinances

[8] ***Manual on Uniform Traffic Control Devices (MUTCD)***. Federal Highway Administration, May 2012, https://mutcd.fhwa.dot.gov/kno_2009r1r2.htm

13.0 APPENDIX

- Scoping Correspondence
- Site Plan
- Raw Traffic Count Data
- Approved Development Information
- Traffic Volume Calculations
- Synchro Files
- Synchro & SimTraffic Reports
- SIDRA files