



**REZ-25-01: Wallbrook Flats  
Traffic Impact Analysis**

Rolesville, North Carolina

July 23, 2025

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## Sign-off Sheet

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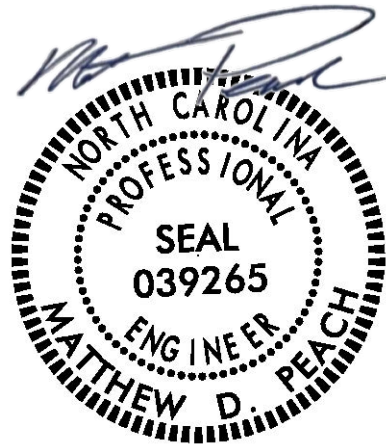
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7/23/2025

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## Executive Summary

The proposed Wallbrook Flats development is located on the south side of Burlington Mills Road west of Main Street (US 401 Business) at 4724 Burlington Mills Road in Rolesville, NC. The applicant is pursuing a rezoning (REZ-25-01) to a Town Center District - Conditional Zoning (TC-CZ). This rezoning (REZ 25-01) involves two properties, the Wallbrook Flats location (PIN 1758486155), as well as portion of the property at 0 S. Main Street (PIN 1758582090). These parcels are currently zoned as Residential High-Density Conditional Zoning (RH-CZ) and General Commercial-Conditional Zoning (GC-CZ) under the Land Development Ordinance (LDO). The rezoning at 0 S. Main Street will cover a 5.13-acre portion of the 7.07-acre parcel that was included in the preliminary subdivision plat for the broader Wallbrook development (PR21-04). Although the property at 0 S. Main Street is included in the rezoning, the applicant does not intend to change the land uses from what was included in the original Wallbrook TIA dated August 11, 2020. Therefore, this study analyzes the proposed land use, and its impacts on traffic associated with the residential development proposed for 4724 Burlington Mills Road (PIN 1758486155) named Wallbrook Flats.

The 10.64-acre site is anticipated to be completed in 2030. The site plan shows 264 units of multifamily housing on site, however, the applicant has requested the traffic study be based on a maximum unit count of 280 units if in the future there is the possibility to add units on-site. Using the Institute of Transportation Engineers (ITE) Trip Generation Manual, it is estimated that at full build-out the development is expected to generate 1,870 new trips per average weekday. In the AM and PM peak hours, the development is expected to generate 110 AM peak hour trips (26 entering and 84 exiting) and 141 PM peak hour trips (89 entering and 52 exiting). Two (2) access points are proposed for the development connecting to Burlington Mills Road. Access A will operate with full movement and be located at the future intersection of Burlington Mills Road at Old Burlington Mills Road. Access B will operate as a right-in / right-out driveway, meaning that left-turns in and out will be restricted, and be located approximately 1,000 feet north of Access A.

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:

- 2025 Existing
- 2030 No-Build
- 2030 Build
- 2030 Build Improved

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

- US 401 Business (Main Street) at SR 2051 (Burlington Mills Road)
- SR 2051 (Burlington Mills Road) at SR 2049 (Forestville Road)



## REZ-25-01: WALLBROOK FLATS TRAFFIC IMPACT ANALYSIS

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

- US 401 Business (Main Street) at SR 2051 (Old Burlington Mills Road)
- SR 2051 (Old Burlington Mills Road) at Burlington Mills Road

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

**Table ES-1: Level of Service Summary Table**

Level of Service (Delay in seconds per vehicle)	2025 Existing		2030 No-Build		2030 Build		2030 Build Imp.	
	AM	PM	AM	PM	AM	PM	AM	PM
Burlington Mills Road at Forestville Road	C (34.2)	C (31.2)	E (55.9)	E (56.6)	E (56.8)	E (58.7)		
Burlington Mills Road at Old Burlington Mills Road / Access A			E (37.7)	C (23.2)	F (73.9)	E (46.5)	F (72.7)	E (44.8)
Burlington Mills Road at Access B					B (12.3)	B (10.9)	B (12.3)	B (10.9)
Main Street at Old Burlington Mills Road	B (15.8)	B (12.6)	D (27.4)	C (19.3)	D (27.5)	C (19.7)		
Main Street at Realigned Burlington Mills Road / Virginia Water Drive			D (51.4)	D (49.8)	D (54.4)	D (52.4)		
Not Included:		Signalized:			Stop-Controlled:			

Rolesville's LDO<sup>8</sup>, 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.*

As shown in Table ES-1, the proposed development accounts for a minimal increase in average delay at the existing and planned study intersections.

At the intersection of Burlington Mills Road at Old Burlington Mills Road / Access A, the southbound left turn movement operates at LOS F in both the AM and PM peak hours. With the proposed development in place, the approach increases in delay from an average of 38 seconds per vehicle to an average of 74 seconds per vehicle in the AM peak hour. In the PM peak hour, the same approach operates at LOS E with the proposed development in place. Long delays at this intersection during the AM peak hour are attributed to traffic traveling to / from Rolesville



Middle School. The school, located just to the west of the proposed development, operates from 8:15 AM to 3:00 PM. At unsignalized intersections, it is common for minor streets to experience higher delays due to the difficulty in making a left-turn movement through the intersection with the uninterrupted main street traffic. While delay per vehicle is high on the approach, the queues are mainly contained within the turn-lanes, with the Southbound thru/right lane operating at LOS C in both peak hours. A traffic signal was evaluated at the intersection and is not recommended due to low side-street traffic volumes.

Based on the findings of this study, specific improvements have been identified and should be completed as part of the proposed development. Intersections where no improvements are recommended are locations that meet the standards specified in the LDO<sup>8</sup>.

### **Burlington Mills Road at Forestville Road**

- No improvements are recommended at this intersection

### **Burlington Mills Road at Old Burlington Mills Road / Access A**

- Construct Access A as a full-movement access point
- Construct Access A with one ingress lane and two egress lanes consisting of an exclusive left-turn lane and a shared thru/right-turn lane. Construct the access with 75 feet of internal protective stem
- Construct a westbound left turn lane on Burlington Mills Road with 50 feet of full-width storage and appropriate taper
- Construct an eastbound right-turn lane on Burlington Mills Road with 50 feet of full-width storage and appropriate taper
- Restripe the southbound approach of Old Burlington Mills Road to provide an exclusive left-turn lane and a shared thru/right-turn lane.

### **Burlington Mills Road at Access B**

- Construct Access B as a restricted-movement access point allowing right-turns in and right-turns out only.
- Construct Access B with one ingress lane and one egress lane consisting of an exclusive right-turn lane. Construct the access with 50 feet of internal protective stem
- Construct an eastbound right-turn lane on Burlington Mills Road with 50 feet of full-width storage and appropriate taper

### **Main Street at Old Burlington Mills Road**

- No improvements are recommended at this intersection

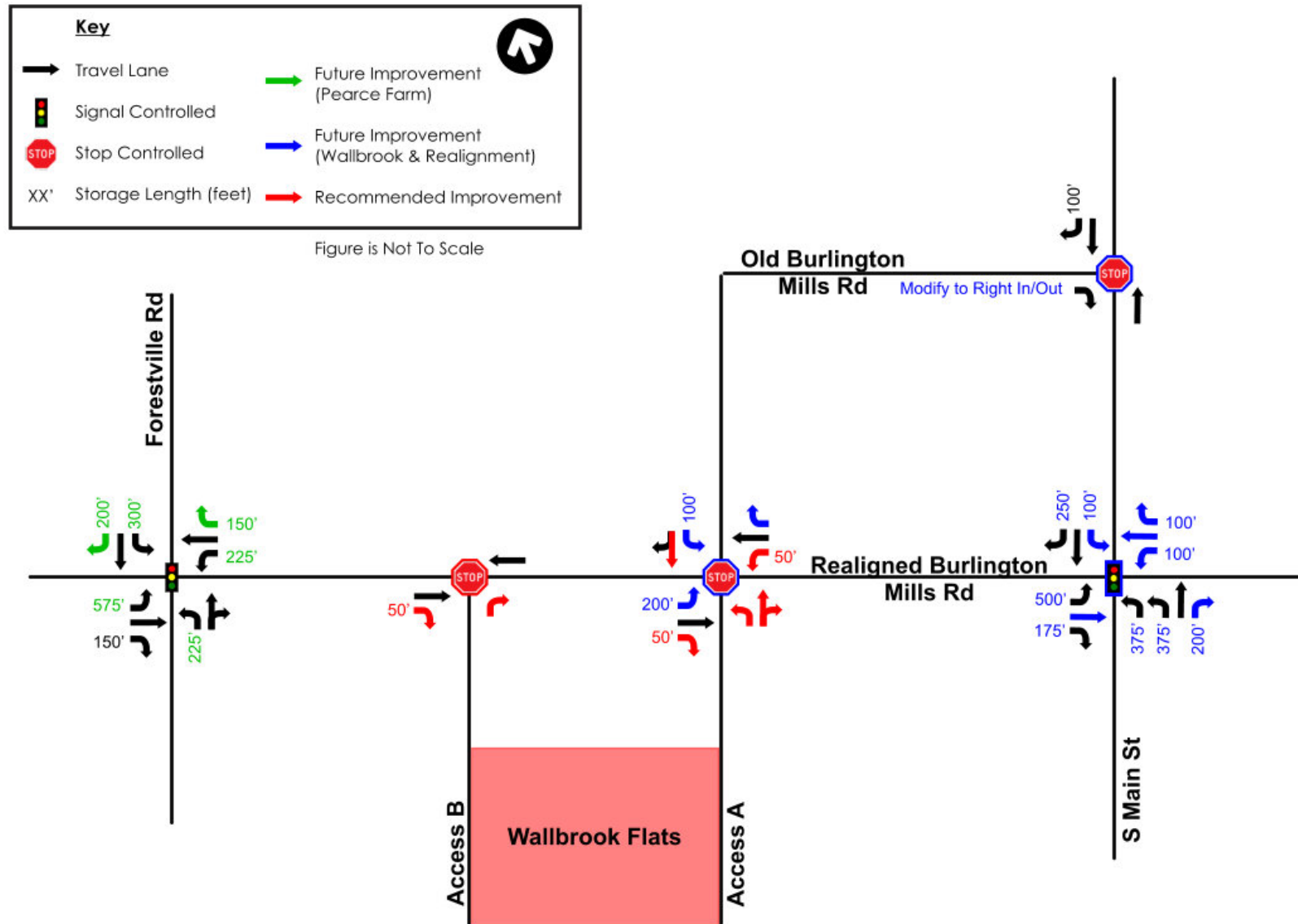
### **Realigned Burlington Mills Road at Main Street**

- No improvements are recommended at this intersection

These recommendations are illustrated in Figure ES-1.



Figure ES-1: Recommended Improvements





## REZ-25-01: WALLBROOK FLATS TRAFFIC IMPACT ANALYSIS

Introduction

July 23, 2025

### 1.0 INTRODUCTION

The proposed Wallbrook Flats development is located on the south side of Burlington Mills Road west of Main Street (US 401 Business) at 4724 Burlington Mills Road in Rolesville, NC. The applicant is pursuing a rezoning (REZ-25-01) to a Town Center District - Conditional Zoning (TC-CZ). This rezoning (REZ 25-01) involves two properties, the Wallbrook Flats location (PIN 1758486155), as well as portion of the property at 0 S. Main Street (PIN 1758582090). These parcels are currently zoned as Residential High-Density Conditional Zoning (RH-CZ) and General Commercial-Conditional Zoning (GC-CZ) under the Land Development Ordinance (LDO). The rezoning at 0 S. Main Street will cover a 5.13-acre portion of the 7.07-acre parcel that was included in the preliminary subdivision plat for the broader Wallbrook development (PR21-04). Although the property at 0 S. Main Street is included in the rezoning, the applicant does not intend to change the land uses from what was included in the original Wallbrook TIA dated August 11, 2020. Therefore, this study analyzes the proposed land use, and its impacts on traffic associated with the residential development proposed for 4724 Burlington Mills Road (PIN 1758486155) named Wallbrook Flats.

The 10.64-acre site is anticipated to be completed in 2030. The site plan shows 264 units of multifamily housing on site, however, the applicant has requested the traffic study be based on a maximum unit count of 280 units if in the future there is the possibility to add units on-site. The project location is shown in Figure 1. The site plan, prepared by McAdams, can be found in Figure 2.

The traffic analysis considers future build conditions during the build-out year (2030). Access to the site is anticipated to be provided by two driveways on Burlington Mills Road. The analysis scenarios are as follows:

- 2025 Existing
- 2030 No-Build
- 2030 Build
- 2030 Build Improved

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 analysis scenarios.

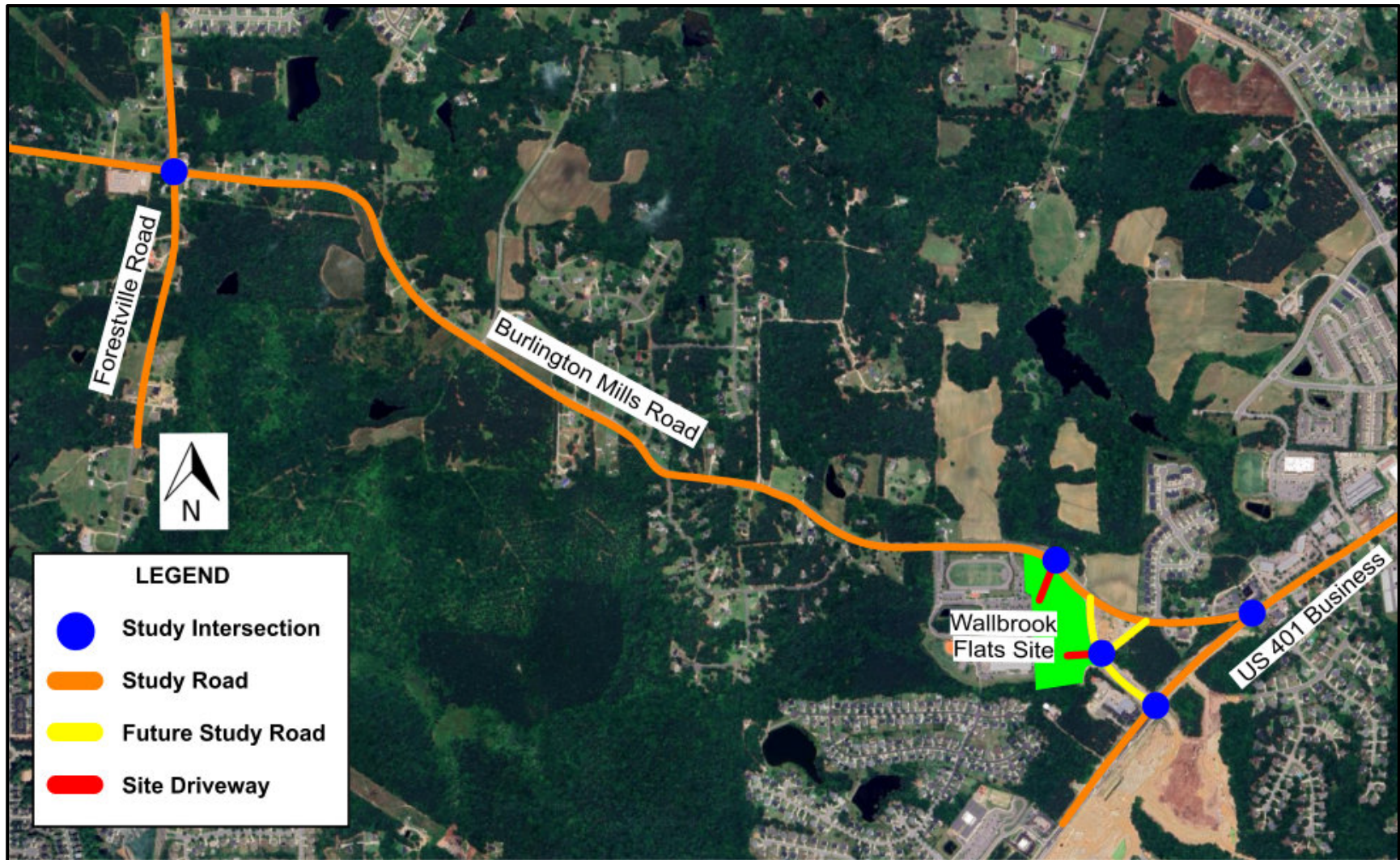


## REZ-25-01: WALLBROOK FLATS TRAFFIC IMPACT ANALYSIS

Introduction

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Figure 1: Site Location

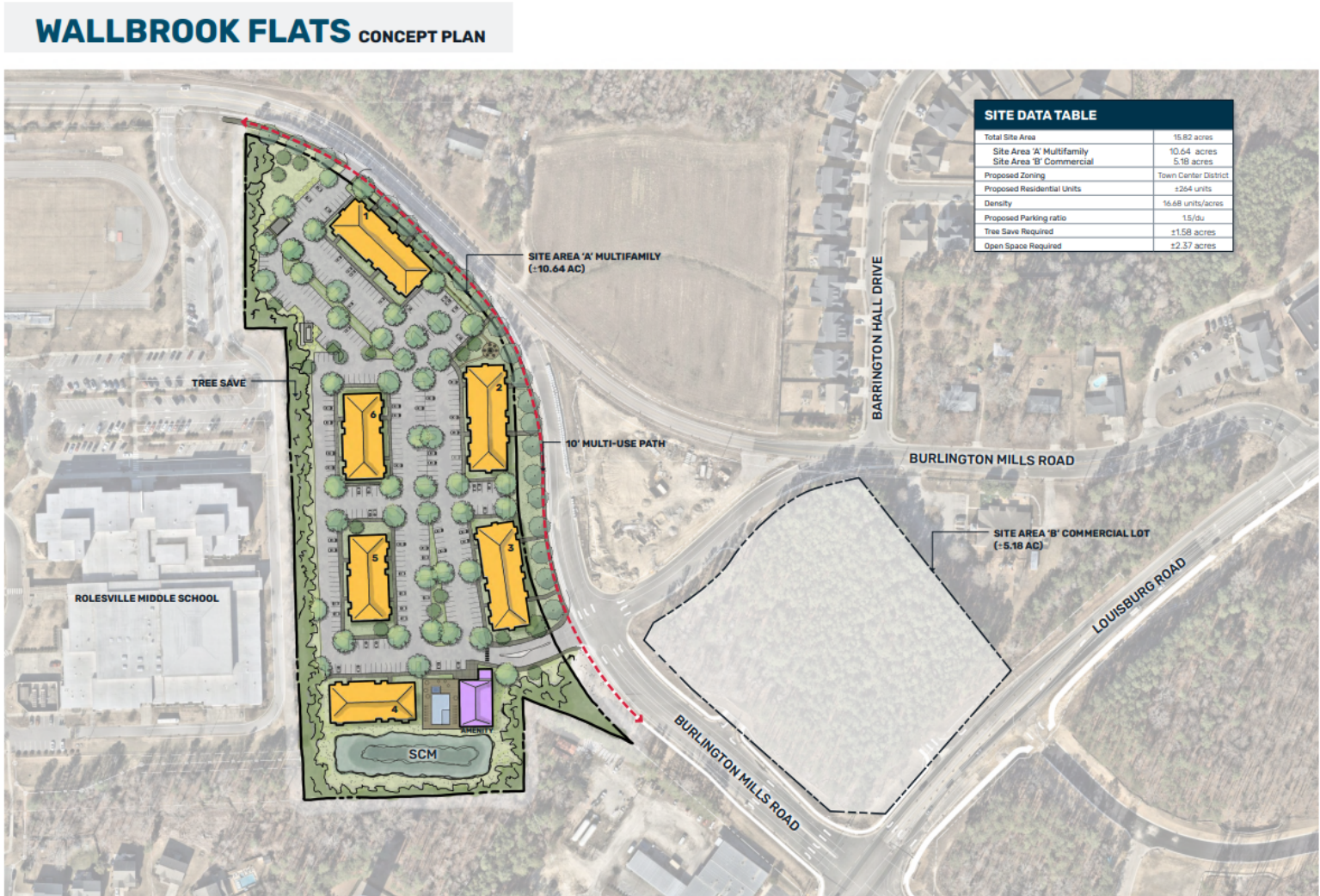




REZ-25-01: WALLBROOK FLATS TRAFFIC IMPACT ANALYSIS

Introduction  
July 23, 2025

Figure 2: Site Plan



WALLBROOK FLATS CONCEPT PLAN  
ROLESVILLE, NORTH CAROLINA



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## 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.

- US 401 Business (Main Street) at SR 2051 (Burlington Mills Road)
- SR 2051 (Burlington Mills Road) at SR 2049 (Forestville Road)

### 2.2 PROPOSED ACCESS

Access to the site is envisioned to be provided by two access points along Burlington Mills Road. Access A will operate with full movement and be located at the future intersection of Burlington Mills Road at Old Burlington Mills Road. This will add a fourth leg to the future three-legged, stop-controlled intersection. The second access, Access B, will be located approximately 1,000 feet north of Access A and will operate with restricted movement, allowing right in/ right out.

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 <sup>1</sup>	AADT <sup>2</sup> (year)	Speed Limit (mph)	Maintenance Agency
Burlington Mills Road	SR 2051	Two-Lane Undivided	Major Collector	4,400-9,000 vpd (2023)	35-45	NCDOT
Forestville Road	SR 2049	Two-Lane Undivided	Minor Arterial	15,000-17,500 vpd (2023)	45	NCDOT
Main Street	US 401 Business	Two-Lane w/ TWLTL*	Principal Arterial	11,000-14,500 vpd (2023)	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.

### 2.3 FUTURE CONDITIONS

The following sub-sections discuss the projects that are anticipated to modify the study area intersections between 2025 and the future year 2030. The future year lane configuration and traffic control for the study area intersections are illustrated in Figure 4.



## REZ-25-01: WALLBROOK FLATS TRAFFIC IMPACT ANALYSIS

Inventory of Traffic Conditions  
July 23, 2025

### 2.3.1 U-6241 (Main Street)

The U-6241 project will realign Burlington Mills Road near Main Street as well as make streetscape and multimodal improvements along Main Street. The access point to the proposed development is located approximately 700 feet west of where the realigned Burlington Mills Road will tie into the existing alignment of Burlington Mills Road (a.k.a. Old Burlington Mills Road). This will create a new, three-legged, stop-controlled intersection.

The project will convert the existing signalized intersection of Main Street at Burlington Mills Road to an unsignalized (i.e., stop-controlled) intersection. Furthermore, Burlington Mills Road will be converted from full-movement access onto Main Street to right-in / right-out only access.

### 2.3.2 Pearce Farm (fka Tom's Creek)

The following improvements are currently proposed to be implemented in association with the development of the Pearce Farm site:

#### **Burlington Mills Road at Forestville Road**

- Extend the existing eastbound left-turn lane to 575 feet of full-width storage and appropriate taper
- Extend the existing westbound left-turn lane to 225 feet of full-width storage and appropriate taper
- Construct a westbound right-turn lane with 150 feet of full-width storage and appropriate taper
- Extend the existing northbound left-turn lane to 225 feet of full-width storage and appropriate taper
- Extend the existing southbound left-turn lane to 300 feet of full-width storage and appropriate taper
- Construct a southbound right-turn lane with 200 feet of full-width storage and appropriate taper

A copy of the TIA is contained in the Appendix. Pearce Farm is discussed in more detail in Section 4.3.1.

### 2.3.3 Wallbrook

The following improvements were committed to by the Wallbrook development:

#### **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

A copy of the TIA is contained in the Appendix. The Wallbrook development is discussed in more detail in Section 4.3.2.



Figure 3: 2025 Existing Lanes and Traffic Control

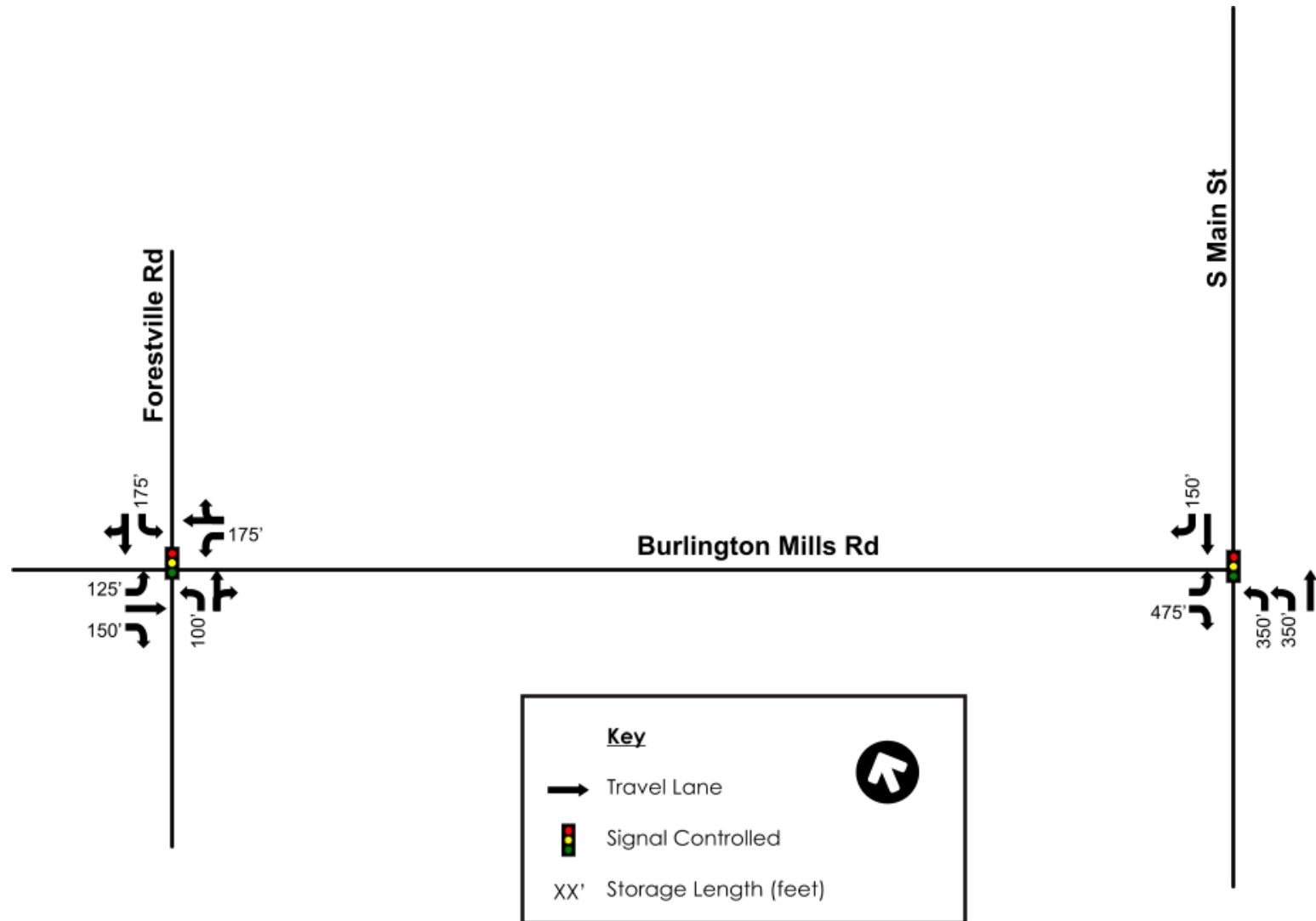


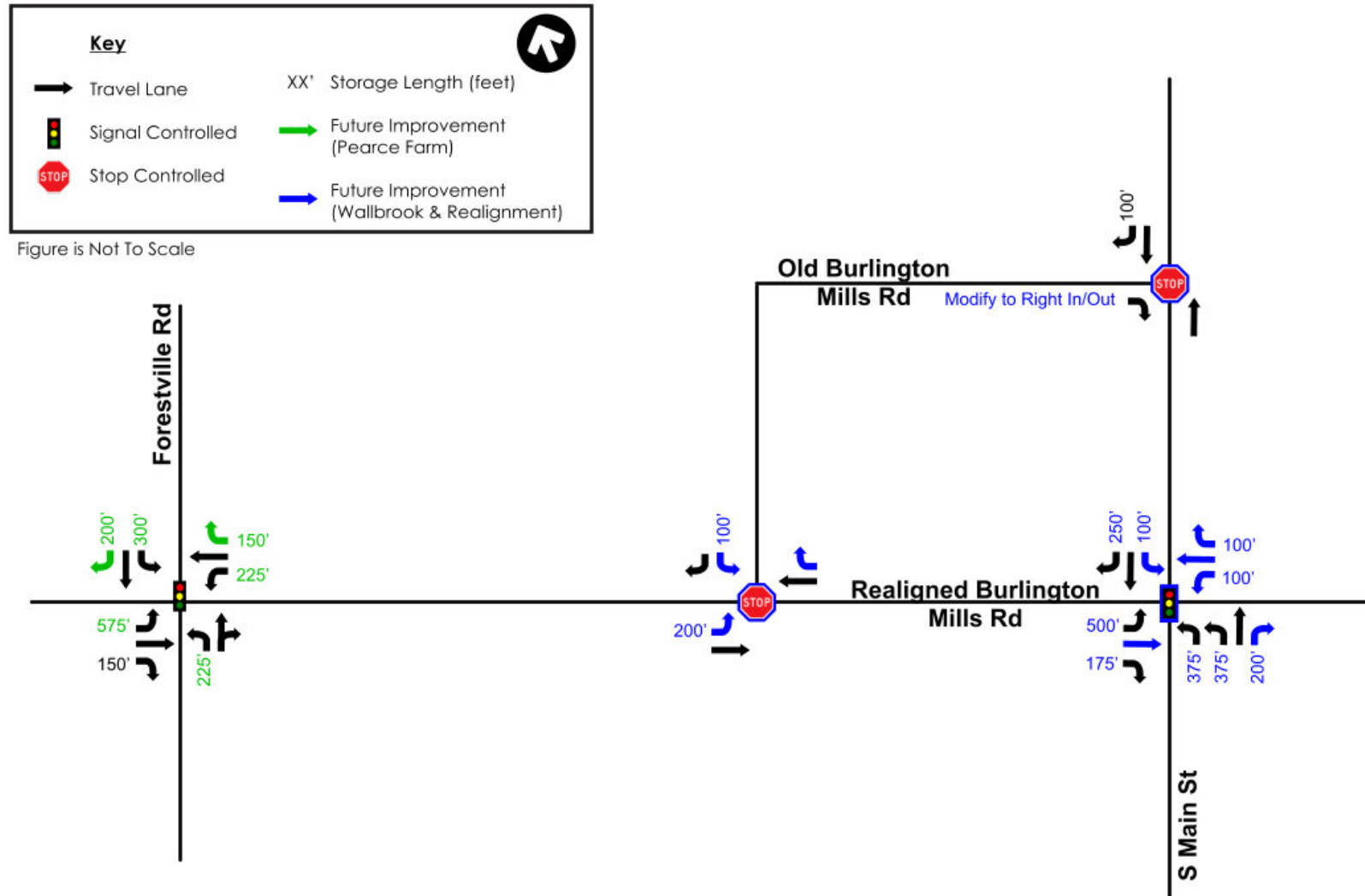
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# REZ-25-01: WALLBROOK FLATS TRAFFIC IMPACT ANALYSIS

Inventory of Traffic Conditions  
July 23, 2025

Figure 4: 2030 No-Build Lanes and Traffic Control



## 3.0 TRIP GENERATION AND DISTRIBUTION

### 3.1 TRIP GENERATION

Trip generation for the proposed development was performed using the 11<sup>th</sup> Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual<sup>3</sup>. The Rate Versus Equation spreadsheet published by NCDOT<sup>4</sup> 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
Multifamily Housing (LUC 220)	280 Units	1870	935	935	110	26	84	141	89	52
<b>Total Trips Generated</b>		<b>1870</b>	<b>935</b>	<b>935</b>	<b>110</b>	<b>26</b>	<b>84</b>	<b>141</b>	<b>89</b>	<b>52</b>

### 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.

- 40% to/from the south on Main Street
- 25% to/from the north on Main Street
- 25% to/from the north on Forestville Road
- 10% to/from the west on Burlington Mills Road

The trip distribution for the proposed development is shown in Figure 5. The trip assignment is shown in Figure 6.





Figure 5: Trip Distribution



Figure 6: Trip Assignment

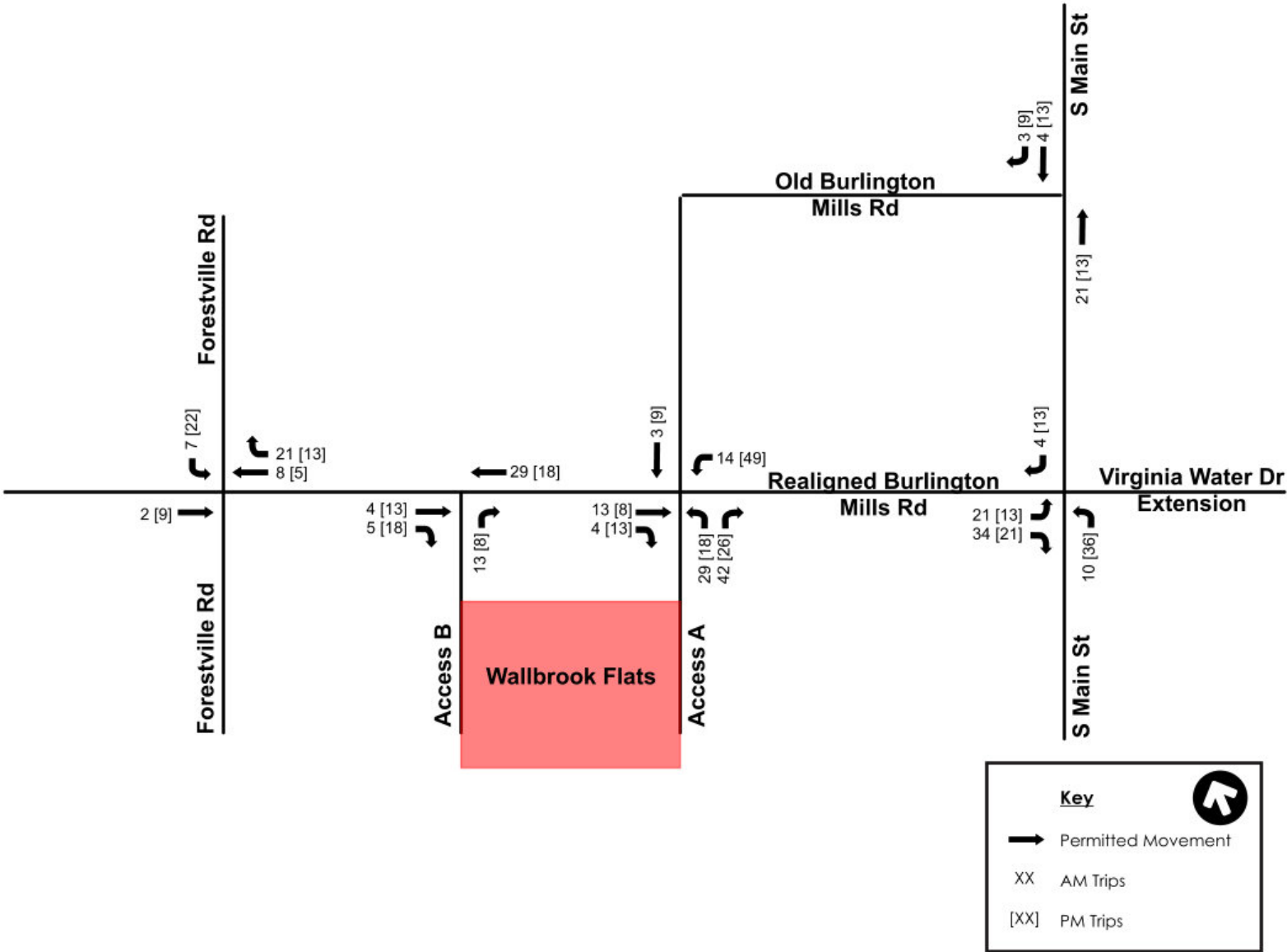


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## 4.0 TRAFFIC VOLUMES

All traffic volume calculations can be found in the Appendix.

### 4.1 DATA COLLECTION

Morning (7:00 – 9:00 AM) and evening (4:00 – 6:00 PM) turning movement counts were taken at the study intersections on May 13, 2025, while schools were in session. Due to the distance between study intersections and the number of driveways between them, the traffic counts were not balanced. All traffic count data can be found in the appendix. The existing (2025) traffic volumes are shown in Figure 7.

### 4.2 BACKGROUND TRAFFIC GROWTH

Background traffic growth is the increase in traffic volumes due to usage increases and non-specific growth throughout the area. The 2025 existing volumes were grown by a 2.0 percent annual rate to estimate the 2030 volumes. The growth in vehicles as a result of this future traffic growth is shown in Figure 8.

### 4.3 ADJACENT DEVELOPMENT TRAFFIC

There are two (2) developments proposed to be constructed within and nearby the study area: Pearce Farm (fka Tom's Creek), and Wallbrook. The total trips associated with these developments are shown in Figure 9. Figures showing the individual development trips can be found in the appendix. The following subsections highlight salient data for each of the approved developments.

#### 4.3.1 Pearce Farm (fka Tom's Creek)

Pearce Farm is a residential development project located in the southeast quadrant of the Forestville Road and Burlington Mills Road intersection. It is currently assumed that the project will consist of 606 units of single-family detached housing and that the project will be built out by 2029. The improvements associated with the Wallbrook development are discussed in Section 2.4.3. To provide a conservative analysis, it was assumed that the entire project would be built out and completed by the construction of the Wallbrook Flats. The trips attributed to the Pearce Farm development, as well as a copy of the traffic study prepared by Stantec are provided in the Appendix.

#### 4.3.2 Wallbrook

Wallbrook is a proposed mixed-use development project located along 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 currently under construction and not yet completed. The improvements associated with the Wallbrook development are discussed in Section 2.4.3. 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.



## **4.4 NO-BUILD TRAFFIC VOLUMES**

The 2030 No-Build traffic volumes consist of the sum of the 2025 Existing traffic volumes, the Background traffic growth, and the adjacent development growth. The 2030 No-Build traffic volumes are shown in Figure 10.

## **4.5 BUILD TRAFFIC VOLUMES**

The 2030 Build traffic volumes include the 2030 No-Build traffic and the proposed development traffic discussed in Section 3.0. The 2030 Build traffic volumes are shown in Figure 11.



Traffic Volumes  
July 23, 2025

Figure 7: 2025 Existing Traffic Volumes

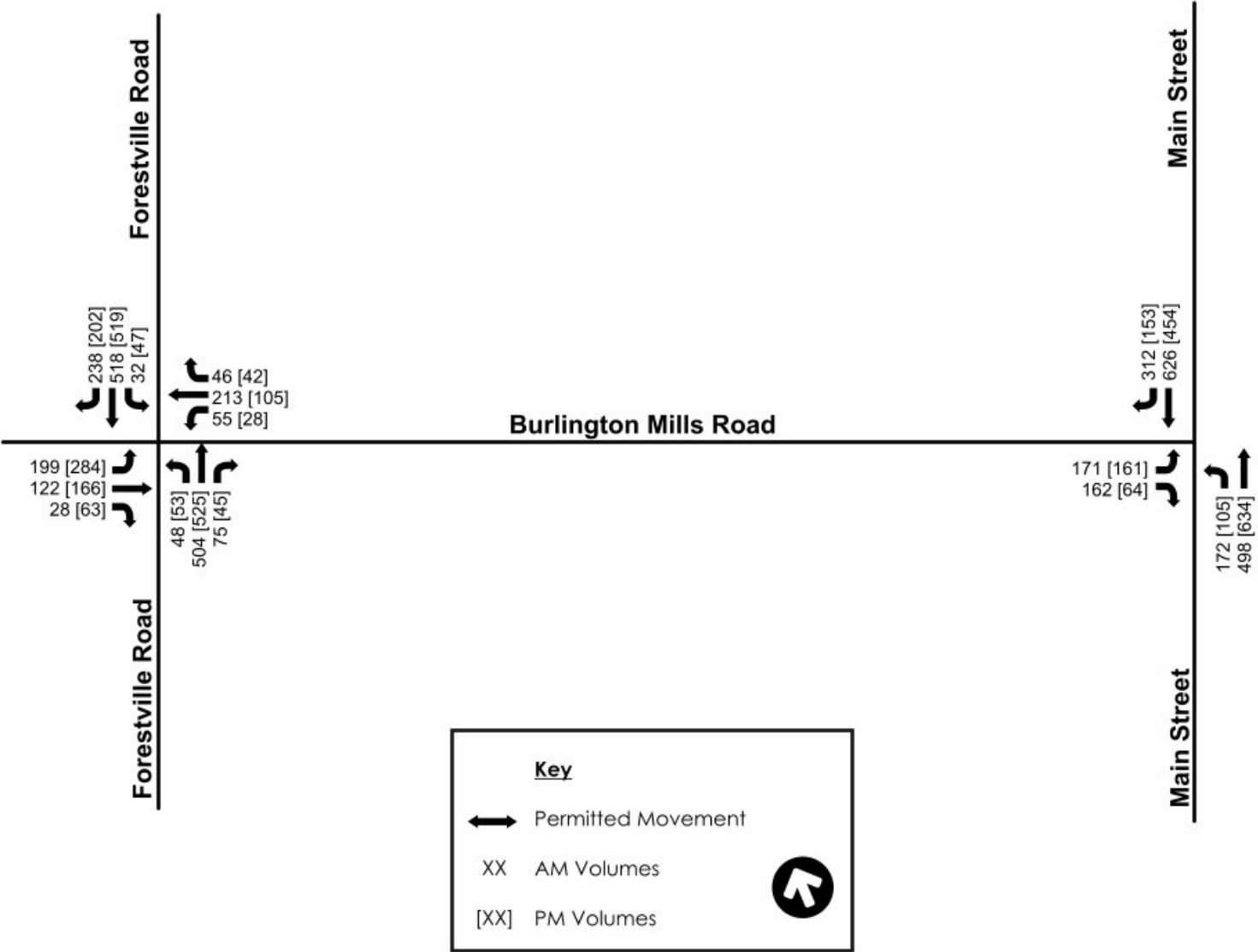


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Traffic Volumes  
 July 23, 2025

Figure 8: Background Traffic Growth

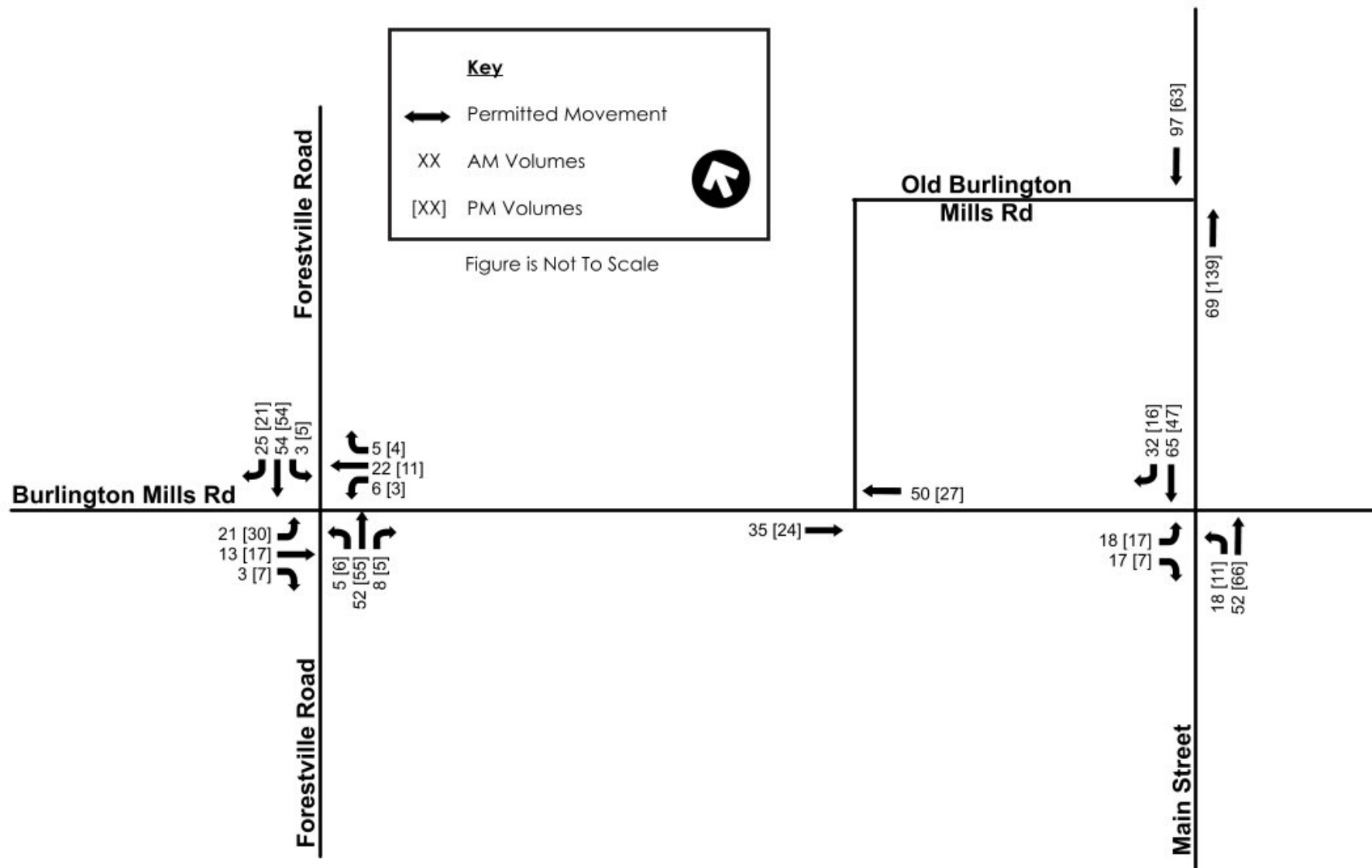
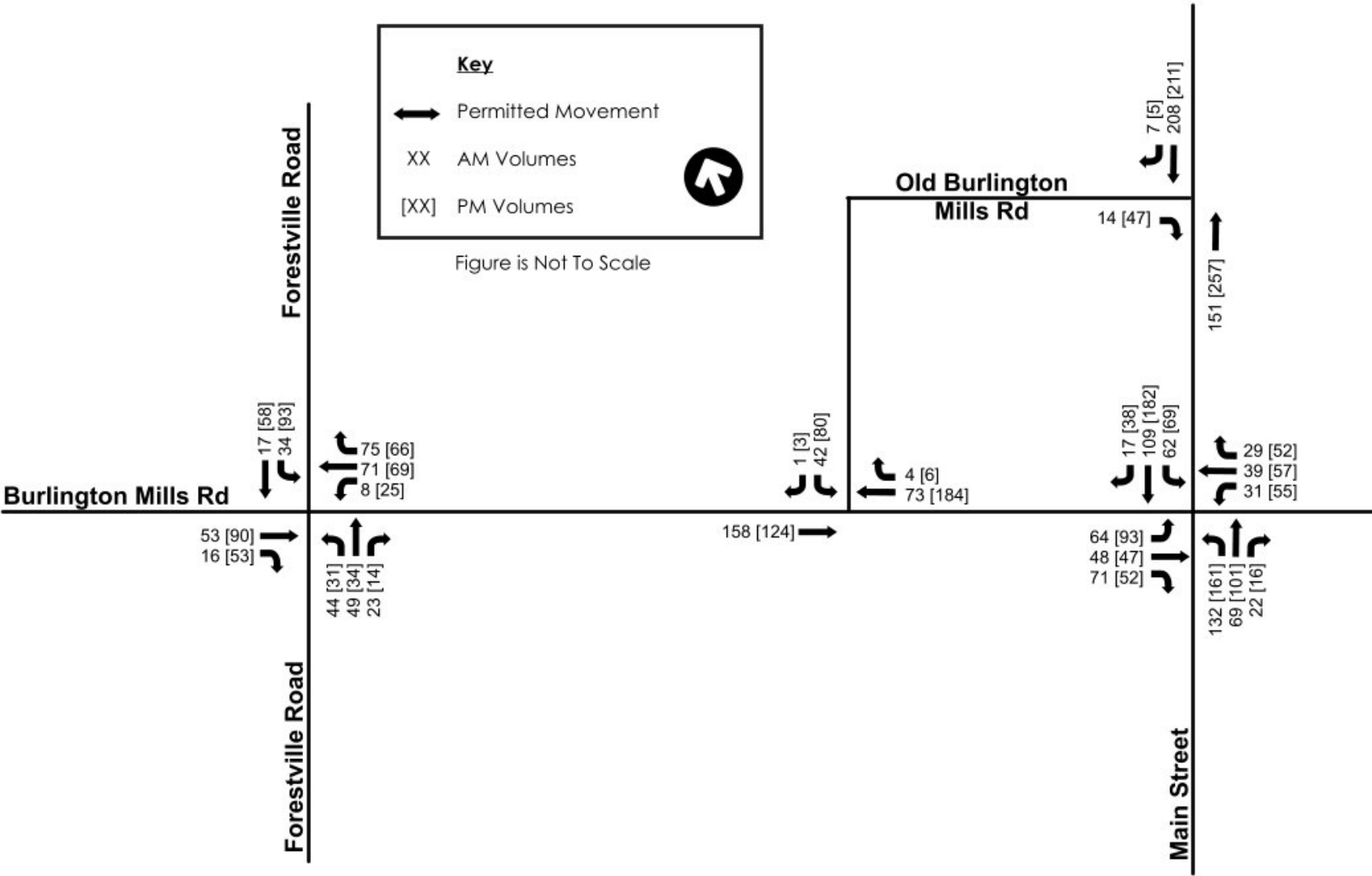


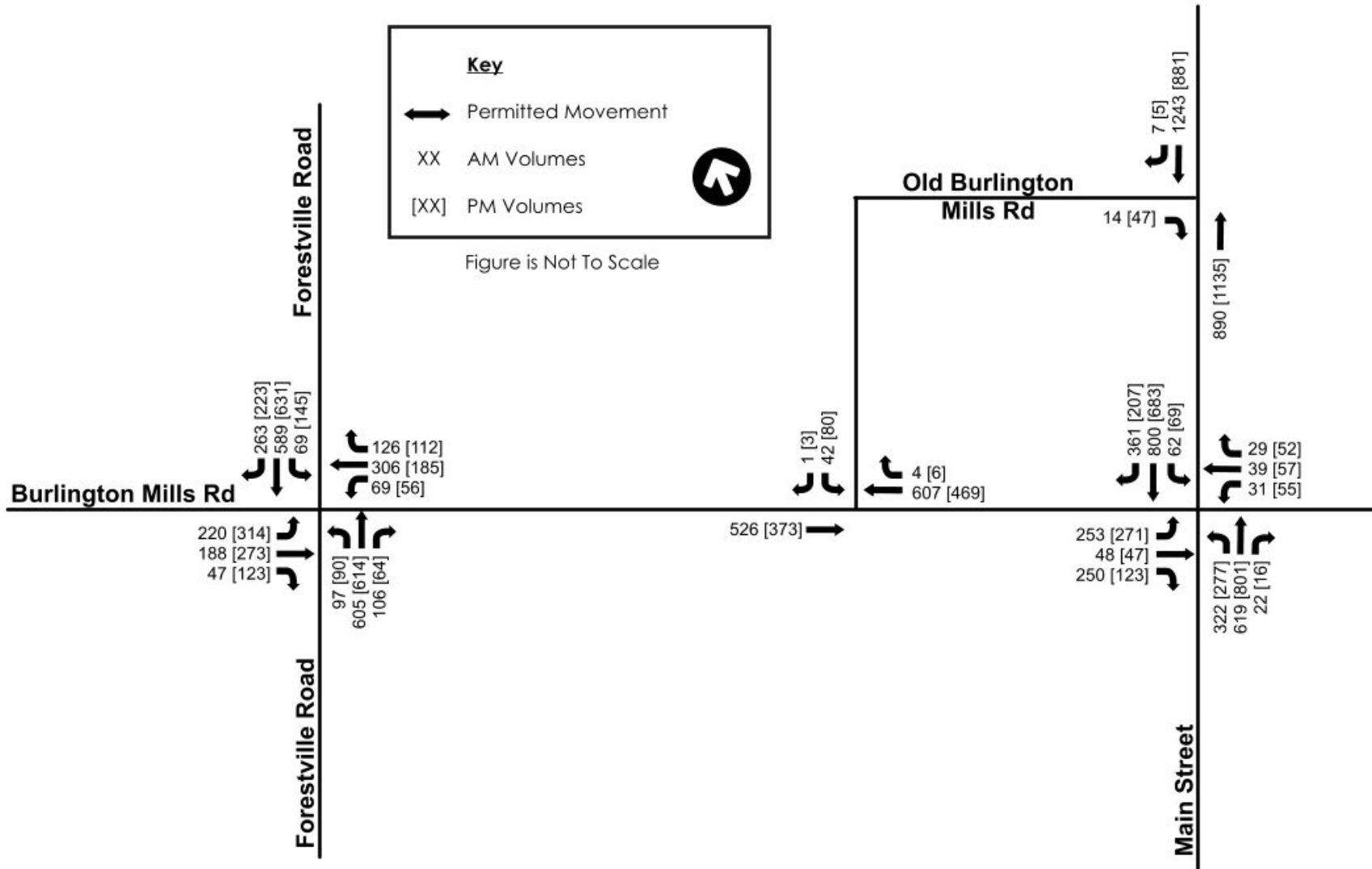
Figure 9: Adjacent Development Traffic Volumes



REZ-25-01: WALLBROOK FLATS TRAFFIC IMPACT ANALYSIS

Traffic Volumes  
July 23, 2025

Figure 10: 2030 No-Build Traffic Volumes

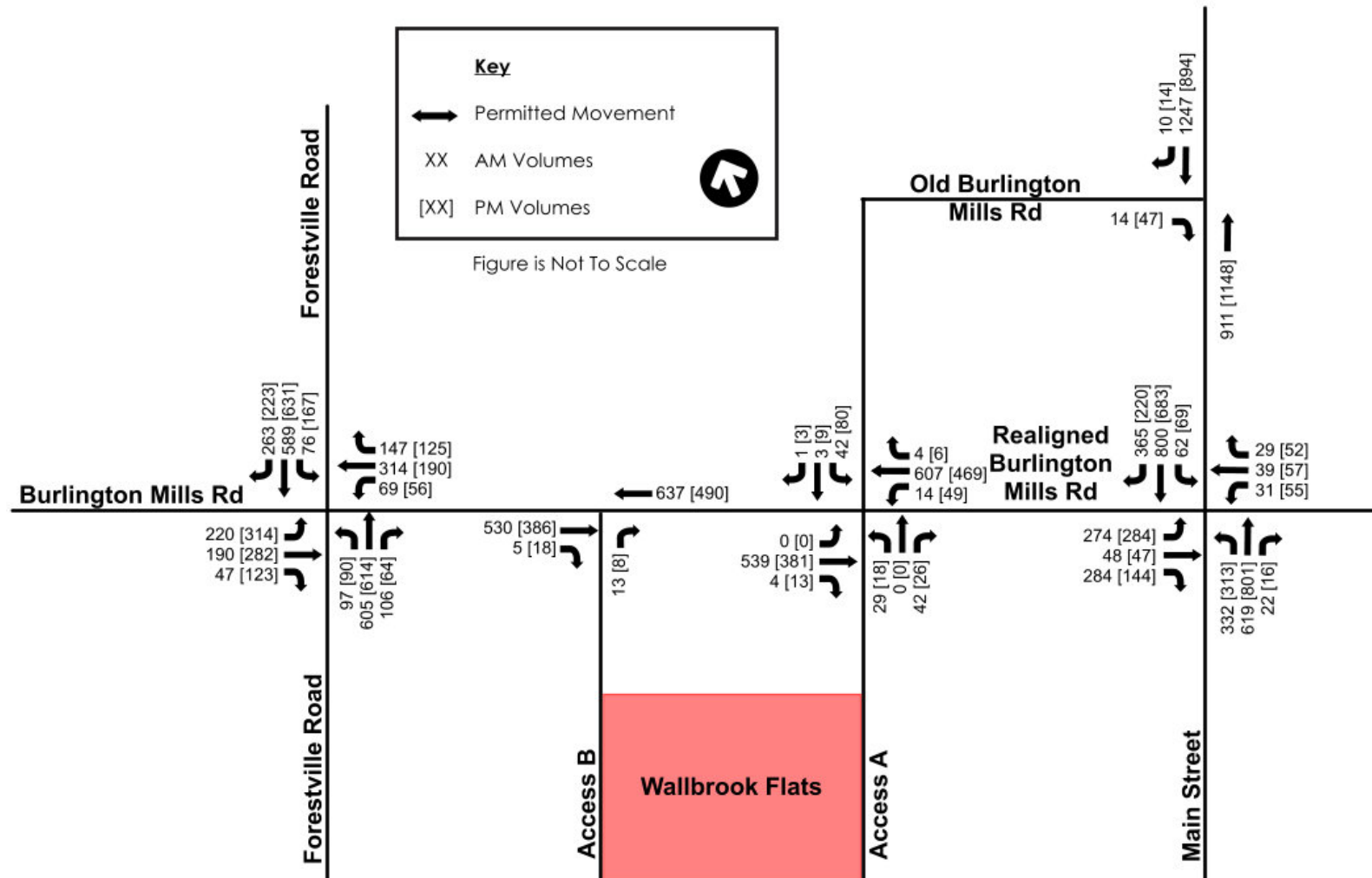




# REZ-25-01: WALLBROOK FLATS TRAFFIC IMPACT ANALYSIS

Traffic Volumes  
July 23, 2025

Figure 11: 2030 Build 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 was used to analyze all signalized and stop-controlled intersections according to methods put forth by the Transportation Research Board's Highway Capacity Manual<sup>5</sup> (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*<sup>6</sup> as well as the *Draft NCDOT Capacity Analysis Guidelines Best Practices*<sup>7</sup>. Table 3 presents the criteria of each LOS as indicated in the HCM.

**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)<sup>8</sup>, 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.*



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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.

All Synchro files and detailed printouts can be found in the Appendix.


### 5.1 2025 EXISTING

In the base year under the existing geometric conditions, both study intersections operate at an overall acceptable LOS. It should be noted that the Burlington Mills Road at Forestville Road eastbound left, operates at LOS F and LOS E in the AM and PM peak hours; respectively. The results from the 2025 existing analysis are shown in Table 4. Instances where the overall intersection or lane group operate at LOS E or F are highlighted in the table.

**Table 4: 2025 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
	Burlington Mills Road at Forestville Road	Overall		34.2	31.2	C	C				
		EB	L	99.5	71.9	F	E	274	344	223	224
			T	25.9	26.8	C	C	106	139	631	588
			R	15.0	15.5	B	B	26	48	130	214
		WB	L	19.3	17.2	B	B	43	23	120	59
			TR	24.8	19.5	C	B	155	81	253	181
		NB	L	8.6	9.0	A	A	24	26	165	160
			TR	12.6	12.7	B	B	290	284	352	340
		SB	L	14.1	14.9	B	B	29	39	274	274
TR	42.5		37.8	D	D	724	674	734	596		
	Burlington Mills Road at Main Street	Overall		15.8	12.6	B	B				
		EB	L	41.0	38.9	D	D	87	57	140	116
			T	5.4	6.3	A	A	174	245	229	260
		WB	T	15.5	11.6	B	B	396	256	472	232
			R	2.6	1.9	A	A	51	27	250	124
		SB	L	40.5	32.7	D	C	171	152	301	247
			R	21.5	14.1	C	B	136	33	186	107

 Intersection or Lane Group Operates at LOS E

 Intersection or Lane Group Operates at LOS F



## 5.2 2030 NO-BUILD

In the 2030 No-Build conditions, the analysis assumes the improvements associated with the adjacent developments and NCDOT projects are constructed. These improvements, discussed in Section 2.4, are listed below:

### Burlington Mills Road at Forestville Road

- Extend the existing eastbound left-turn lane to 575 feet of full-width storage and appropriate taper
- Extend the existing westbound left-turn lane to 225 feet of full-width storage and appropriate taper
- Construct a westbound right-turn lane with 150 feet of full-width storage and appropriate taper
- Extend the existing northbound left-turn lane to 225 feet of full-width storage and appropriate taper
- Extend the existing southbound left-turn lane to 300 feet of full-width storage and appropriate taper
- Construct a southbound right-turn lane with 200 feet of full-width storage and appropriate taper

### 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

### Main Street at Old Burlington Mills Road

- The existing signalized and full-movement intersection will be converted to a stop-controlled right-in / right-out intersection.

Synchro LOS and delay results for the 2030 No-Build analysis scenario are listed in Table 5. Instances where the overall intersection or lane group operate at LOS E or F are highlighted in the table. The intersection of Main Street at Realigned Burlington Mills Road is projected to operate at an overall LOS D in both peak hours with individual movements operating at LOS E and F. The intersection of Burlington Mills Road at Forestville Road is projected to operate at an overall LOS E in both peak hours with individual movements operating at LOS E and F.

At the unsignalized intersection of Burlington Mills Road at Old Burlington Mills Road, the southbound left-turn from Old Burlington Mills Road onto Realigned Burlington Mills Road operates at LOS E in the AM peak hour. This is attributed to high thru volumes on Burlington Mills Road due to traffic to / from Rolesville Middle School.

SimTraffic observations noted queues exceeding 1,000 feet on the northbound approach of Burlington Mills Road at Forestville Road. Similarly, the northbound (AM) and southbound (AM & PM) approaches of Main Street resulted in a maximum observed queue greater than 1,000 feet.







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**Table 5: 2030 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
	Burlington Mills Road at Forestville Road	Overall		55.9	56.6	E	E				
		EB	L	104.7	90.9	F	F	390	464	430	504
			T	31.9	32.0	C	C	198	263	271	331
			R	19.1	18.8	B	B	49	100	80	188
		WB	L	59.1	64.3	E	E	117	94	263	199
			T	94.7	100.6	F	F	500	312	644	370
			R	26.8	25.5	C	C	115	88	250	213
		NB	L	88.9	86.9	F	F	189	169	325	325
			TR	59.6	61.1	E	E	924	821	1091	1334
		SB	L	85.1	122.0	F	F	142	269	321	400
T	41.7		42.5	D	D	649	700	623	953		
R	8.7		7.8	A	A	105	100	300	300		
	Burlington Mills Road at Old Burlington Mills Road	EB	L	9.2	8.5	A	A	0	0	28	30
		SB	L	40.1	23.8	E	C	33	33	68	96
			R	12.2	10.7	B	B	0	0	26	25
	Main Street at Old Burlington Mills Road	EB	R	27.4	19.3	D	C	8	15	289	171
	Realigned Burlington Mills Road at Main Street	Overall		51.4	49.8	D	D				
		EB	L	134.6	125.3	F	F	516	518	362	456
			T	60.3	54.5	E	D	92	84	342	230
			R	44.4	32.1	D	C	313	134	271	164
		WB	L	79.5	79.6	E	E	74	110	81	114
			T	78.7	74.4	E	E	87	108	116	133
			R	54.2	38.0	D	D	58	67	95	100
		NB	L	68.0	75.8	E	E	236	257	468	475
			T	25.5	35.6	C	D	674	1058	585	1186
			R	9.9	5.9	A	A	21	11	219	273
		SB	L	81.3	90.5	F	F	124	142	200	200
			T	54.2	35.7	D	D	1248	785	1106	1084
			R	12.1	5.2	B	A	257	54	350	350

 Intersection or Lane Group Operates at LOS E

 Intersection or Lane Group Operates at LOS F


### 5.3 2030 BUILD

As part of the 2030 Build analysis, the proposed driveways were added to the network as detailed in Section 2.2.

With the proposed development in place, a minimal increase in average delay at the study intersections without a proposed driveway was observed when compared with the 2030 No-Build analysis. At the intersection of Main Street at Realigned Burlington Mills Road, individual movements at the intersection experience longer delays when compared to the no-build analysis, however, the overall intersection continues to operate at LOS D. Queuing observed in the No-Build analysis is still present in the Build scenario with long queues observed at the intersections of Burlington Mills at Forestville Road and Realigned Burlington Mills Road at Main Street.

At the intersection of Burlington Mills Road at Old Burlington Mills Road / Access A, the southbound left turn movement operates at LOS F in both the AM and PM peak hours. With the proposed development in place, the approach increases in delay from an average of 38 seconds per vehicle to an average of 74 seconds per vehicle in the AM peak hour. In the PM peak hour, the same approach operates at LOS E with the proposed development in place. Long delays at this intersection during the AM peak hour are attributed to traffic traveling to / from Rolesville Middle School. The school, located just to the west of the proposed development, operates from 8:15 AM to 3:00 PM. At unsignalized intersections, it is common for minor streets to experience higher delays due to the difficulty in making a left-turn movement through the intersection with the uninterrupted main street traffic. While delay per vehicle is high on the approach, the queues are mainly contained within the turn-lanes, with the Southbound thru/right lane operating at LOS C in both peak hours.

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

- Burlington Mills Road at Forestville Road – EBL, WBT, NBL, SBL – AM and PM peak hours
- Burlington Mills Road at Old Burlington Mills Road / Access A – SBL – AM and PM peak hours
- Realigned Burlington Mills Road at Main Street – EBL, WBL, SBL – AM and PM peak hours, WBT – AM peak hour, NBL – PM peak hour

Synchro LOS and delay results for the 2030 Build scenario are listed in Table 6. Instances where the overall intersection or lane group operate at LOS E or F are highlighted in the table.








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**Table 6: 2030 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
	Burlington Mills Road at Forestville Road	Overall		56.8	58.7	E	E				
		EB	L	106.5	102.5	F	F	390	476	398	576
			T	31.3	34.2	C	C	197	279	239	693
			R	18.6	20.0	B	C	48	104	76	203
		WB	L	57.4	68.5	E	E	116	101	304	287
			T	92.5	126.5	F	F	505	334	500	728
			R	27.2	25.7	C	C	130	98	250	250
		NB	L	89.6	86.9	F	F	189	169	325	325
			TR	62.1	61.1	E	E	936	821	1112	1160
		SB	L	91.3	110.3	F	F	158	294	372	398
T	42.9		38.4	D	D	659	635	730	822		
R	9.0		7.4	A	A	109	97	300	300		
	Burlington Mills Road at Old Burlington Mills Road / Access A	EB	L	9.2	8.5	A	A	0	0	29	21
		WB	LT	8.8	8.4	A	A	0	5	321	203
		NB	LTR	41.3	21.2	E	C	55	18	80	81
		SB	L	83.3	50.6	F	F	58	70	62	104
			TR	24.9	21.2	C	C	3	5	29	46
	Burlington Mills Road at Access B	NB	R	12.3	10.9	B	B	3	0	31	31
	Main Street (US 401 Business) at Old Burlington Mills Road	EB	R	27.5	19.6	D	C	8	15	263	240
	Realigned Burlington Mills Road at Main Street (US 401 Business)	Overall		54.4	52.4	D	D				
		EB	L	143.0	126.4	F	F	569	551	414	492
			T	59.7	55.2	E	E	92	86	389	320
			R	45.2	33.1	D	C	356	155	270	206
		WB	L	85.8	82.9	F	F	77	113	88	112
			T	81.6	77.4	F	E	89	111	124	146
			R	56.2	39.5	E	D	61	68	81	97
		NB	L	69.6	86.3	E	F	248	291	463	475
			T	26.6	36.4	C	D	694	1086	641	1231
			R	11.0	6.3	B	A	23	11	218	219
		SB	L	83.3	95.4	F	F	127	149	199	200
			T	57.7	37.2	E	D	1299	828	1107	1094
			R	12.5	5.3	B	A	271	58	350	350

 Intersection or Lane Group Operates at LOS E

 Intersection or Lane Group Operates at LOS F


## 5.4 2030 BUILD IMPROVED

### 5.4.1 Proposed Improvements

#### Burlington Mills Road at Old Burlington Mills Road / Access A

- Construct Access A as a full-movement access point
- Construct Access A with one ingress lane and two egress lanes consisting of an exclusive left-turn lane and a shared thru/right-turn lane. Construct the access with 75 feet of internal protective stem
- Construct a westbound left turn lane on Burlington Mills Road with 50 feet of full-width storage and appropriate taper
- Construct an eastbound right-turn lane on Burlington Mills Road with 50 feet of full-width storage and appropriate taper
- Restripe the southbound approach of Old Burlington Mills Road to provide an exclusive left-turn lane and a shared thru/right-turn lane.

#### Burlington Mills Road at Access B

- Construct Access B as a restricted-movement access point allowing right-turns in and right-turns out only.
- Construct Access B with one ingress lane and one egress lane consisting of an exclusive right-turn lane. Construct the access with 50 feet of internal protective stem
- Construct an eastbound right-turn lane on Burlington Mills Road with 50 feet of full-width storage and appropriate taper

### 5.4.2 Analysis Results



The 2030 Build Improved capacity analysis results are shown in Table 7. Instances where the overall intersection or lane group operate at LOS E or F are highlighted in the table. Based on the findings of this study, specific improvements have been identified and should be completed as part of the proposed development. The proposed development accounts for a minimal increase in average delay at the study intersections. Intersections where no improvements are recommended are locations that meet the LOS Standards specified in the LDO<sup>8</sup>.

While delay per vehicle is high for left-turning traffic on the side street approaches to the intersection of Burlington Mills Road at Old Burlington Mills Road / Access A, the queues are contained within the turn-lanes, with the thru/right lane operating at LOS C in both peak hours. A traffic signal was evaluated at the intersection and is not recommended due to low side-street traffic volumes. This is discussed in section 5.4.3.





**Table 7: 2030 Build Improved 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
	Burlington Mills Road at Old Burlington Mills Road / Access A	EB	L	9.2	8.5	A	A	0	0	30	13
		WB	L	8.8	8.4	A	A	0	5	32	62
		NB	L	58.5	29.3	F	D	33	10	54	43
			TR	15.6	13.0	C	B	10	5	59	45
		SB	L	81.9	48.7	F	E	58	68	64	90
			TR	24.7	20.9	C	C	3	5	36	44
	Burlington Mills Road at Access B	NB	R	12.3	10.8	B	B	3	0	31	27

 Intersection or Lane Group Operates at LOS E

 Intersection or Lane Group Operates at LOS F

### 5.4.3 Traffic Signal Warrants

The results shown in Table 7 show that high delays (in seconds per vehicle) are anticipated on the side street approaches of Old Burlington Mills Road and the proposed Site Access A. These high delays are observed in the AM peak hour which can be attributed to traffic traveling to/from Rolesville Middle School. The intersection operates above LOS F in the PM peak hour.

The intersection is planned to be located approximately 650 feet from the future signalized intersection of Main Street at Burlington Mills Road / Virginia Water Drive. If signalized, queues could spill back and affect operations at either Main Street or the proposed driveway.

Volumes on the side streets of Old Burlington Mills Road and the proposed driveway are lower than the threshold established by the Manual on Uniform Traffic Control Devices (MUTCD)<sup>9</sup> peak hour warrant for the installation of a traffic signal (i.e., Warrant 3). As a result, the intersection of Burlington Mills Road at Old Burlington Mills Road / Access A is not recommended for the installation of a traffic signal.

### 5.4.4 Conceptual Design

A conceptual design of the intersection of Burlington Mills Road at Old Burlington Mills Road / Access A has been produced to determine the amount of storage that can be provided with minimal impact to U-6241 currently under construction. The design shown in Figure 13 provides the following:

#### Left-Turn Lane at the Proposed Access A

The design shown provides 100 feet total of full-width turn lane which can be broken down into 50 feet of full-width deceleration length and 50 feet of full-width storage. The combined length is greater than the SimTraffic maximum observed queueing of 62 feet as shown in Table 7.



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### **U-6241 Left-Turn Lanes at Main Street**

The conceptual design reduces the storage of the left-turn lanes by approximately 15 feet.



## 6.0 RECOMMENDATIONS

Based on the findings of this study, specific improvements have been identified and should be completed as part of the proposed development. These recommendations are shown in Figure 12. A conceptual design is provided in Figure 13. Intersections where no improvements are recommended are locations that meet the LOS Standards specified in the LDO<sup>8</sup>.

### Burlington Mills Road at Forestville Road

- No improvements are recommended at this intersection

### Burlington Mills Road at Old Burlington Mills Road / Access A

- Construct Access A as a full-movement access point
- Construct Access A with one ingress lane and two egress lanes consisting of an exclusive left-turn lane and a shared thru/right-turn lane. Construct the access with 75 feet of internal protective stem
- Construct a westbound left turn lane on Burlington Mills Road with 50 feet of full-width storage and appropriate taper
- Construct an eastbound right-turn lane on Burlington Mills Road with 50 feet of full-width storage and appropriate taper
- Restripe the southbound approach of Old Burlington Mills Road to provide an exclusive left-turn lane and a shared thru/right-turn lane.

### Burlington Mills Road at Access B

- Construct Access B as a restricted-movement access point allowing right-turns in and right-turns out only.
- Construct Access B with one ingress lane and one egress lane consisting of an exclusive right-turn lane. Construct the access with 50 feet of internal protective stem
- Construct an eastbound right-turn lane on Burlington Mills Road with 50 feet of full-width storage and appropriate taper

### Main Street at Old Burlington Mills Road

- No improvements are recommended at this intersection

### Realigned Burlington Mills Road at Main Street

- No improvements are recommended at this intersection



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Figure 12: Recommended Improvements

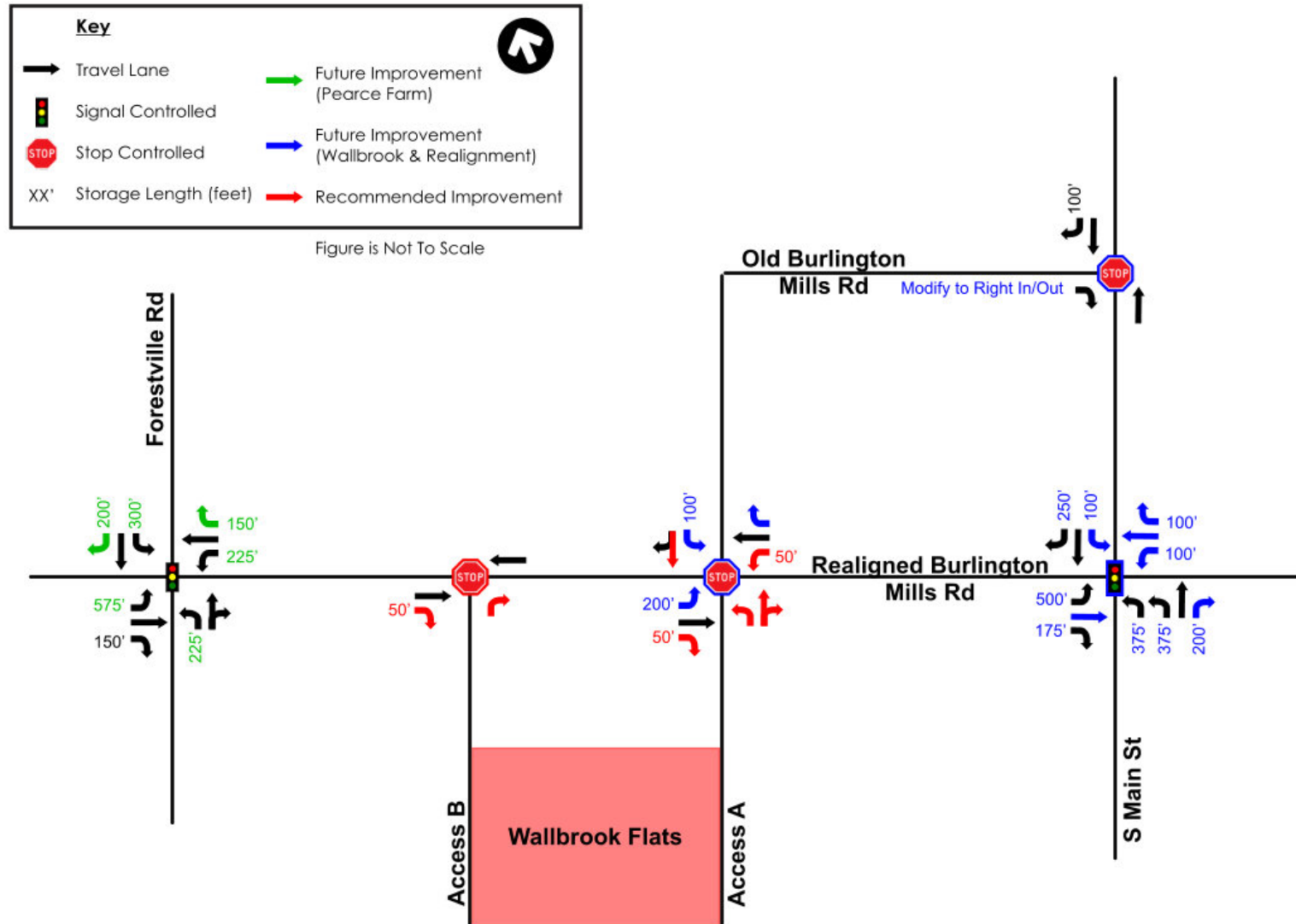


Figure 13: Conceptual Design



References

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## 7.0 REFERENCES

<sup>1</sup> **NCDOT Functional Classification Map**,

<http://ncdot.maps.arcgis.com/home/webmap/viewer.html?layers=029a9a9fe26e43d687d30cd3c08b1792>

<sup>2</sup> **2020 NCDOT Average Daily Traffic Volumes**,

<https://ncdot.maps.arcgis.com/apps/webappviewer/index.html?id=964881960f0549de8c3583bf46ef5ed4>

<sup>3</sup> **Trip Generation (11<sup>th</sup> Edition)**, Institute of Transportation Engineers (ITE), September 2021.

<sup>4</sup> **NCDOT Trip Generation Rate Equation Recommendations**,

<https://connect.ncdot.gov/resources/safety/Congestion%20Mngmt%20and%20Signing/DRAFT%20-%20Trip%20Generation%20Rate%20Eqn.xlsm>

<sup>5</sup> **Highway Capacity Manual 6<sup>th</sup> Edition: A Guide for Multimodal Mobility Analysis**. Washington D.C.: Transportation Research Board, 2016.

<sup>6</sup> **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>

<sup>7</sup> **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>

<sup>8</sup> **Land Development Ordinance**. Town of Rolesville, June 1, 2021, <https://www.rolesvillenc.gov/code-ordinances>

<sup>9</sup> **Manual on Uniform Traffic Control Devices**. United States Department of Transportation - Federal Highway Administration, last modified September 14, 2022, [https://mutcd.fhwa.dot.gov/pdfs/2009r1r2r3/pdf\\_index.htm](https://mutcd.fhwa.dot.gov/pdfs/2009r1r2r3/pdf_index.htm)

## 8.0 APPENDIX

- Scoping Correspondence
- Site Plan
- Raw Traffic Count Data
- Adjacent Development Information
- Adjacent Development Traffic Volumes
- Traffic Volume Calculations
- Synchro Files
- Synchro & SimTraffic Reports
- Conceptual Design

