REZ-25-06: WakeMed Rolesville Traffic Impact Analysis

Rolesville, North Carolina

~~April 15, 2026~~June 8, 2026

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Sign-off Sheet

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Executive Summary

The proposed WakeMed Rolesville development is located on the north side of Burlington Mills Road west of Main Street (US 401 Business) between Walls Cove Lane and the Barrington Subdivision in Rolesville, NC.

The 31.38-acre site is anticipated to be completed in 2027. The site plan shows a 36,000 freestanding emergency department. The applicant is pursuing a rezoning from residential low density (RL) to Commercial Highway (CH). The rezoning would allow a number of uses on-site. After coordinating with the applicant, it was decided to analyze a 40,000 square foot (SF) medical office building. Using the Institute of Transportation Engineers (ITE) Trip Generation Manual, it is estimated that at full build-out the development is expected to generate 1,550 new trips per average weekday. In the AM and PM peak hours, the development is expected to generate 105 AM peak hour trips (82 entering and 23 exiting) and 142 PM peak hour trips (43 entering and 99 exiting).

Two (2) access points are proposed for the development connecting to Granite Falls Boulevard. Both will operate as full-movement driveways onto Granite Falls Boulevard as shown in the site plan. However, the northernmost driveway will operate as a left-in and right-out only as Granite Falls Boulevard will terminate at the driveway. Access A is located approximately 400 feet north from Burlington Mills Road whereas Access B is located approximately 200 feet north from Burlington Mills Road.

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

- 2026 Existing
- 2027 No-Build
- 2027 Build
- 2027 Build Improved

Capacity analysis for the AM and PM peak hours in each scenario was performed for the following existing intersections in addition to the two proposed driveways:

- Burlington Mills Road at Forestville Road
- Burlington Mills Road at Walls Cove Lane
- Burlington Mills Road at Old Burlington Mills Road
- Burlington Mills Road at S. Main 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 for two horizon years. The first horizon year is a near term analysis of the proposed development in the buildout year of 2027. The second horizon year is a longer term analysis of the development potential of the site ten (10) years following the buildout year (i.e. 2037). The intent of the long-term analysis is to forecast traffic in the immediate vicinity of the development of (1) Granite Falls Boulevard is extended and (2) further development occurs on-site. This further development is not based upon guidance or feedback from WakeMed. Rather, is a result of a development study to determine how well the available land could accommodate a

freestanding Emergency Center growing into a full-service community medical center. The site development study focused on site test fit plans with building massing blocks based upon projected areas from the generation of a high-level space and parking program. It should be noted that the current proposal consists of a 36,000 SF facility and that the current rezoning limits the development to 40,000 SF. If any development beyond 40,000 SF is proposed, the rezoning and conditions would have to be revisited.

The results of the near-term (2027) capacity analysis are summarized in Table ES-1.

Table ES-1: 2027 Level of Service Summary Table

Level of Service (Delay in seconds per vehicle)	2026 Existing		2027 No-Build		2027 Build		2027 Build Imp.	
	AM	PM	AM	PM	AM	PM	AM	PM
Burlington Mills Road at Forestville Road	D (52.0)	D (42.5)	D (41.3)	D (41.3)	D (41.7)	D (42.6)		
Burlington Mills Road at Walls Cove Lane / Rolesville Middle School	C (19.0)	B (11.4)	D (25.0)	B (14.2)	D (29.3)	B (14.5)		
Burlington Mills Road at Old Burlington Mills Road / Wallbrook Flats Access	B (14.1)	B (10.5)	E (44.3)	D (26.9)	F (61.6)	E (35.8)		
Main Street at Burlington Mills Road / Virginia Water Drive	C (29.6)	C (23.5)	E (65.3)	E (58.4)	E (58.1)	E (68.1)		
Burlington Mills Road at Granite Falls Boulevard					E (40.0)	C (17.0)	E (36.6)	C (16.5)
Granite Falls Boulevard at Access B					A (8.7)	A (8.9)	A (8.7)	A (8.9)
Not Included:		Signalized:			Stop-Controlled:			

The results of the near-term (2027) analysis, show that the proposed development accounts for a minimal increase in overall LOS at the existing study intersections with one exception. Specifically, long delays were observed for traffic turning left from the side streets at the intersection of Burlington Mills Road at Old Burlington Mills Road / Wallbrook Flats Access. The southbound left-turn increases in delay from 44 seconds per vehicle to 62 seconds per vehicle in the AM peak hour. Accordingly, the following mitigation measures were considered:

- Installation of a traffic signal
- Restricting side street access to right-turns out only

A traffic signal was considered at the intersection of Burlington Mills Road at Old Burlington Mills Road at Wallbrook Flats Access. However, this is not recommended due to the spacing between the intersection and the signalized intersection of S. Main Street at Burlington Mills Road due to the spacing between intersections.

Restricting access via a left-over which would allow side street traffic to only make right-turns was also considered. Through evaluation, this would negatively impact the intersection of Burlington Mills Road at Main Street as it would cause U-turns to occur on the eastbound approach of Burlington Mills Road.

Without improvements, left-turns are shown to incur high delays, however right-turning traffic operates with an acceptable LOS. It is common for minor streets at unsignalized intersection to experience higher delays due to the

difficulty in making a left-turn movement through the intersection with the uninterrupted main street traffic. Furthermore, the queues are largely contained within the existing turn-lanes. As a result, no improvements are recommended at this intersection. Long-term, relocating the Wallbrook Flats Access from its current location westward to where Granite Falls Boulevard intersects Burlington Mills Road should be considered.

Rolesville's Land Development Ordinance (LDO), 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.*

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.

Near Term Improvements (2027)

Burlington Mills Road at Granite Falls Boulevard

- Extend Granite Falls Boulevard to Burlington Mills Road with one ingress and one egress lane consisting of a shared left/right turn lane
- Construct an eastbound left turn lane on Burlington Mills Road with 50 feet of full-width storage and appropriate taper
- Construct a westbound right-turn lane on Burlington Mills Road with 50 feet of full-width storage and appropriate taper

Burlington Mills Road at Access A

- Construct Access A with one ingress and one egress lane consisting of a right turn lane
- Construct the northbound approach of Granite Falls Boulevard to provide a left turn lane

Burlington Mills Road at Access B

- Construct Access B with one ingress and one egress lane consisting of a shared left/right turn lane
- Construct the northbound approach of Granite Falls Boulevard to provide a shared left turn/thru lane

These recommendations are illustrated in Figure ES-1.

Figure ES-1: 2027 Recommended Improvements

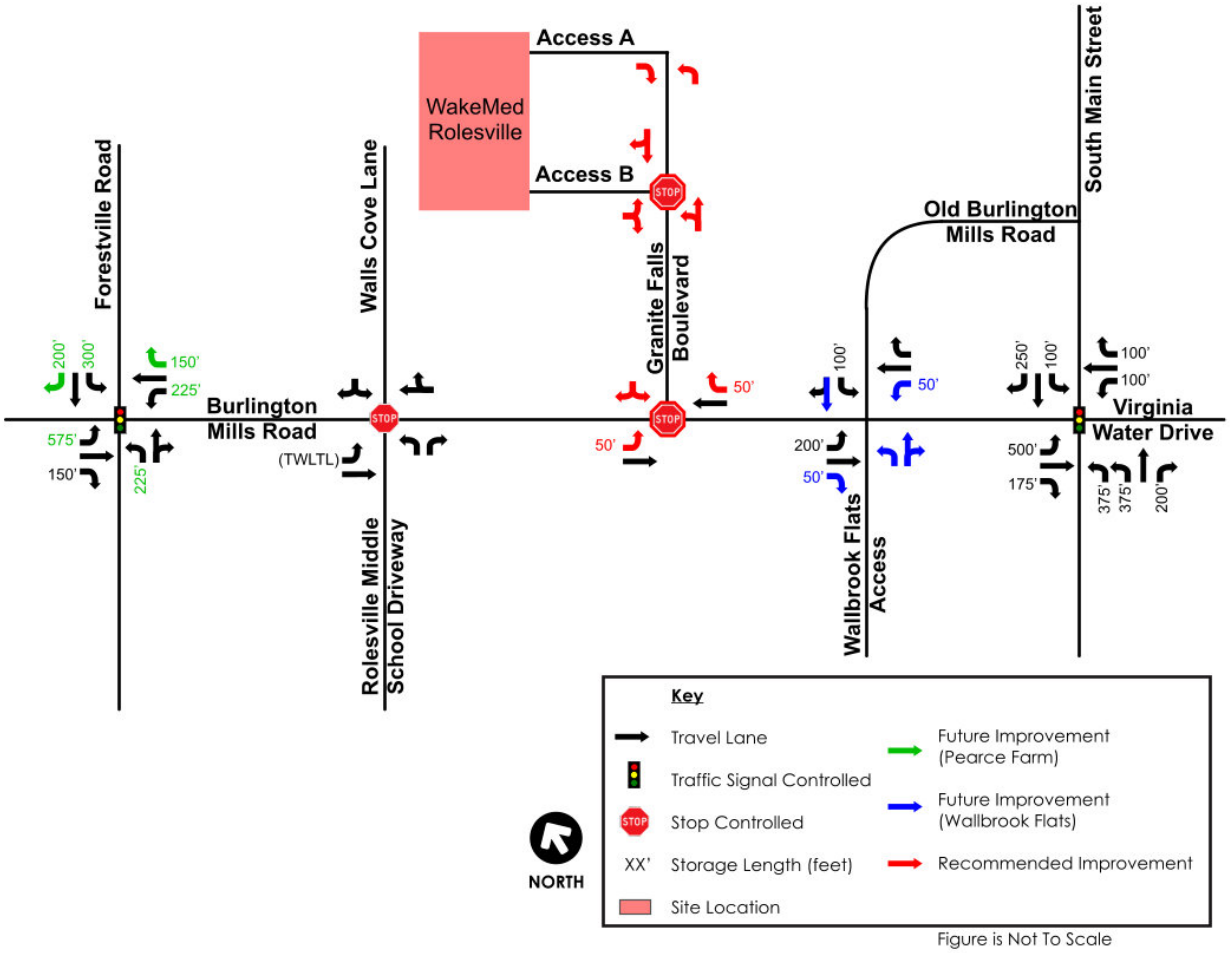


Figure is Not To Scale

REZ-25-06: WAKEMED ROLESVILLE TRAFFIC IMPACT ANALYSIS

In addition to analyzing the development as proposed, the Town of Rolesville has requested that the study include a long-term scenario that analyzes traffic if the following two (2) developments occur:

1. The site is fully build-out as a 486,921 SF hospital.
2. Granite Falls Boulevard is extended.

Commented [MP1]: Revised per WakeMed's feedback

The square footage noted above is the result of a development study to determine how well the available land could accommodate a freestanding emergency center growing into a full-service community medical center. It should be noted that the current proposal consists of a 36,000 SF facility and that the current rezoning limits the development to 40,000 SF. If any development beyond 40,000 SF is proposed, the rezoning and conditions would have to be revisited. The intent of the long-term analysis is to forecast traffic in the immediate vicinity of the development of (1) Granite Falls Boulevard is extended and (2) further development occurs on-site. This further development is not based upon guidance or feedback from WakeMed. Rather, is a result of a development study to determine how well the available land could accommodate a freestanding Emergency Center growing into a full-service community medical center. The site development study focused on site test fit plans with building massing blocks based upon projected areas from the generation of a high-level space and parking program.

The Granite Falls Boulevard extension is a Town project that would provide a continuous connection from Burlington Mills Road to Rogers Road. Using the ITE Trip Generation Manual, it is estimated that a 486,921 SF hospital is expected to generate 6,626 new trips per average weekday. In the AM and PM peak hours, it is expected to generate 537 AM peak hour trips (365 entering and 172 exiting) and 544 PM peak hour trips (185 entering and 359 exiting). This analysis assumes a future year of 2037 (i.e. 10 years following the initial buildout).

The long-term analysis examines the following scenarios for the AM and PM peak hours:

- 2037 No-Build
- 2037 Build
- 2037 Build Improved

Capacity analysis for the long-term scenario for the AM and PM peak hours was performed for the following intersections in addition to the two proposed driveways along Granite Falls Boulevard:

- Burlington Mills Road at Granite Falls Boulevard
- Rogers Road at Granite Falls Boulevard

Table ES-2: 2037 Level of Service Summary Table

Level of Service (Delay in seconds per vehicle)	2037 No-Build		2037 Build		2037 Build Imp.	
	AM	PM	AM	PM	AM	PM
Burlington Mills Road at Granite Falls Boulevard	D (32.3)	B (12.6)	F (217.4)	D (25.4)	B (10.5)	A (9.6)
Granite Falls Boulevard at Access A			B (11.2)	B (10.4)	B (11.2)	B (10.4)
Granite Falls Boulevard at Access B			B (11.3)	B (10.6)	B (11.2)	B (10.6)
Rogers Road at Granite Falls Boulevard	B (14.4)	A (9.9)	B (15.4)	B (11.5)	B (14.8)	B (11.3)
Not Included:		Signalized:			Stop-Controlled:	

As shown in Table ES-2, the southbound approach of Granite Falls Boulevard at Burlington Mills Road experiences high delays in the 2037 Build Scenario. Accordingly, a traffic signal is recommended for if phases beyond the freestanding emergency department are developed in the future. With the installation of a traffic signal, the intersection operates at LOS B or better in both the AM and PM peak hours. All other intersections and driveways in the 2037 Build and Build-Improved scenarios operate at acceptable levels of service.

Based on the findings of this study, specific improvements have been identified and should be considered at the study intersections as the site develops beyond what is currently proposed.

Long Term Improvements (2037)

Burlington Mills Road at Granite Falls Boulevard

- Provide 200 feet of full width storage and appropriate taper to the eastbound left turn lane on Burlington Mills Road
- Provide 175 feet of full width storage and appropriate taper to the westbound right turn lane on Burlington Mills Road
- Construct a southbound right turn lane on Granite Falls Boulevard with 150 feet of full-width storage and appropriate taper
- Provide a full-movement signalized intersection

Granite Falls Boulevard at Access A

- Construct Access A with one ingress and one egress lane consisting of a right turn lane
- Construct a northbound left turn lane on Granite Falls Boulevard with 50 feet of full-width storage and appropriate taper

Granite Falls Boulevard at Access B

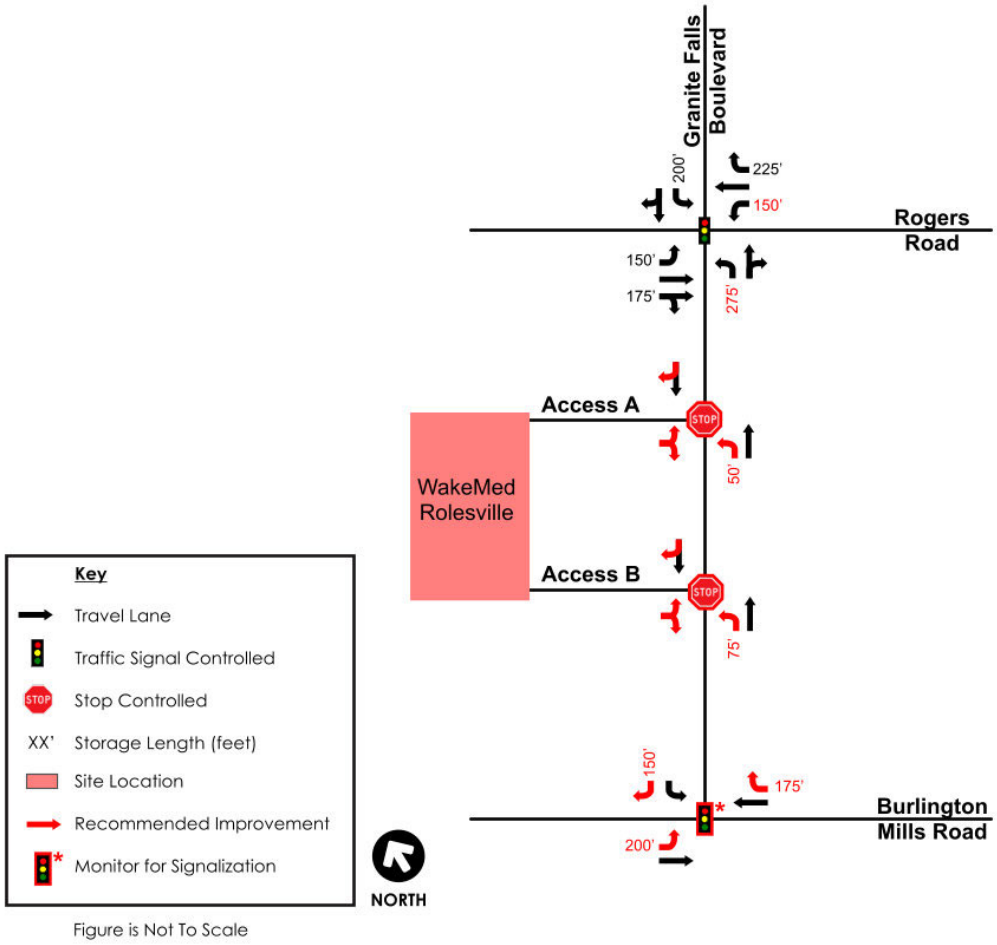
- Construct Access B with one ingress and one egress lane consisting of a shared left/right turn lane
- Construct a northbound left turn lane on Granite Falls Boulevard with 75 feet of full-width storage and appropriate taper

Rogers Road at Granite Falls Boulevard

- Extend the existing northbound left turn lane on Granite Falls Boulevard to 275 feet of full-width storage and appropriate taper
- Extend the existing westbound left turn lane on Rogers Road to 150 feet of full-width storage and appropriate taper

These recommendations are illustrated in Figure ES-2.

Figure ES-2: 2037 Recommended Improvements



1.0 INTRODUCTION

The proposed WakeMed Rolesville development is located on the north side of Burlington Mills Road west of Main Street (US 401 Business) between Walls Cove Lane and the Barrington Subdivision in Rolesville, NC. The applicant is pursuing a rezoning from residential low density (RL) to Commercial Highway (CH).

The 31.38-acre site is anticipated to be completed in 2027. The project location is shown in Figure 1. The site plan, prepared by Kimley-Horn and Associates, can be found in Figure 2. 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.

1.1 NEAR-TERM ANALYSIS (2027)

The traffic analysis considers future build conditions during the build-out year (2027). The site plan shows a 36,000 square foot (SF) freestanding emergency department. The rezoning would allow a number of uses on-site. After coordinating with the applicant, it was decided to analyze a 40,000 SF medical office building.

The site will include building Granite Falls Boulevard through the parcel as shown in Figure 2. Two (2) access points are proposed for the development connecting to Granite Falls Boulevard. Both will operate as full-movement driveways onto Granite Falls Boulevard as shown in the site plan. Access A is located approximately 400 feet north from Burlington Mills Road whereas Access B is located approximately 200 feet north from Burlington Mills Road. The analysis scenarios are as follows and include both the AM and PM peak hours:

- 2026 Existing
- 2027 No-Build
- 2027 Build
- 2027 Build Improved

1.2 LONG-TERM ANALYSIS (2037)

In addition to analyzing the development as proposed, the Town of Rolesville has requested that the study include a long-term scenario ten (10) years following the initial buildout that analyzes traffic if the following two (2) developments occur:

1. The site is fully build-out as a 486,921 SF hospital.
2. Granite Falls Boulevard is extended.

Commented [MP2]: Revised per WakeMed's feedback

The square footage noted above is the result of a development study to determine how well the available land could accommodate a freestanding emergency center growing into a full-service community medical center. It should be noted that the current proposal consists of a 36,000 SF facility and that the current rezoning limits the development to 40,000 SF. If any development beyond 40,000 SF is proposed, the rezoning and conditions would have to be revisited. The intent of the long-term analysis is to forecast traffic in the immediate vicinity of the development of (1) Granite Falls Boulevard is extended and (2) further development occurs on-site. This further development is not

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based upon guidance or feedback from WakeMed. Rather, it is a result of a development study to determine how well the available land could accommodate a freestanding Emergency Center growing into a full-service community medical center. The site development study focused on site test fit plans with building massing blocks based upon projected areas from the generation of a high-level space and parking program. The development study is included in the Appendix. This information was developed and included in this report at the request of the Town for the purpose of planning for Granite Falls Boulevard and is not associated with WakeMed's proposal.

The Granite Falls Boulevard extension is a Town project that would provide a continuous connection from Burlington Mills Road to Rogers Road. ~~A conceptual site plan showing what could be built on-site is shown in Figure 3.~~ The analysis scenarios are as follows and include both the AM and PM peak hours:

- 2037 No-Build
- 2037 Build
- 2037 Build Improved

Figure 1: Site Location

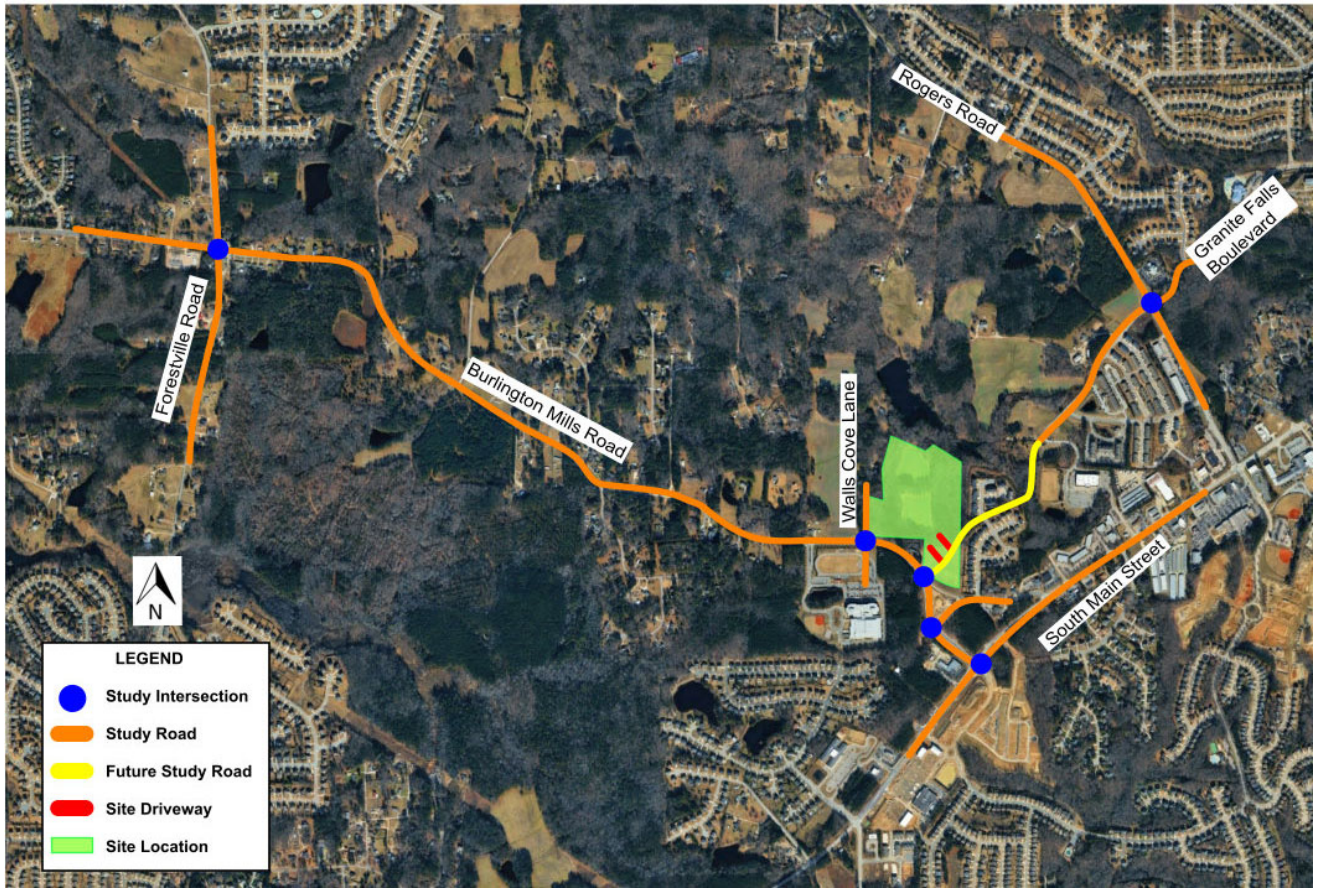
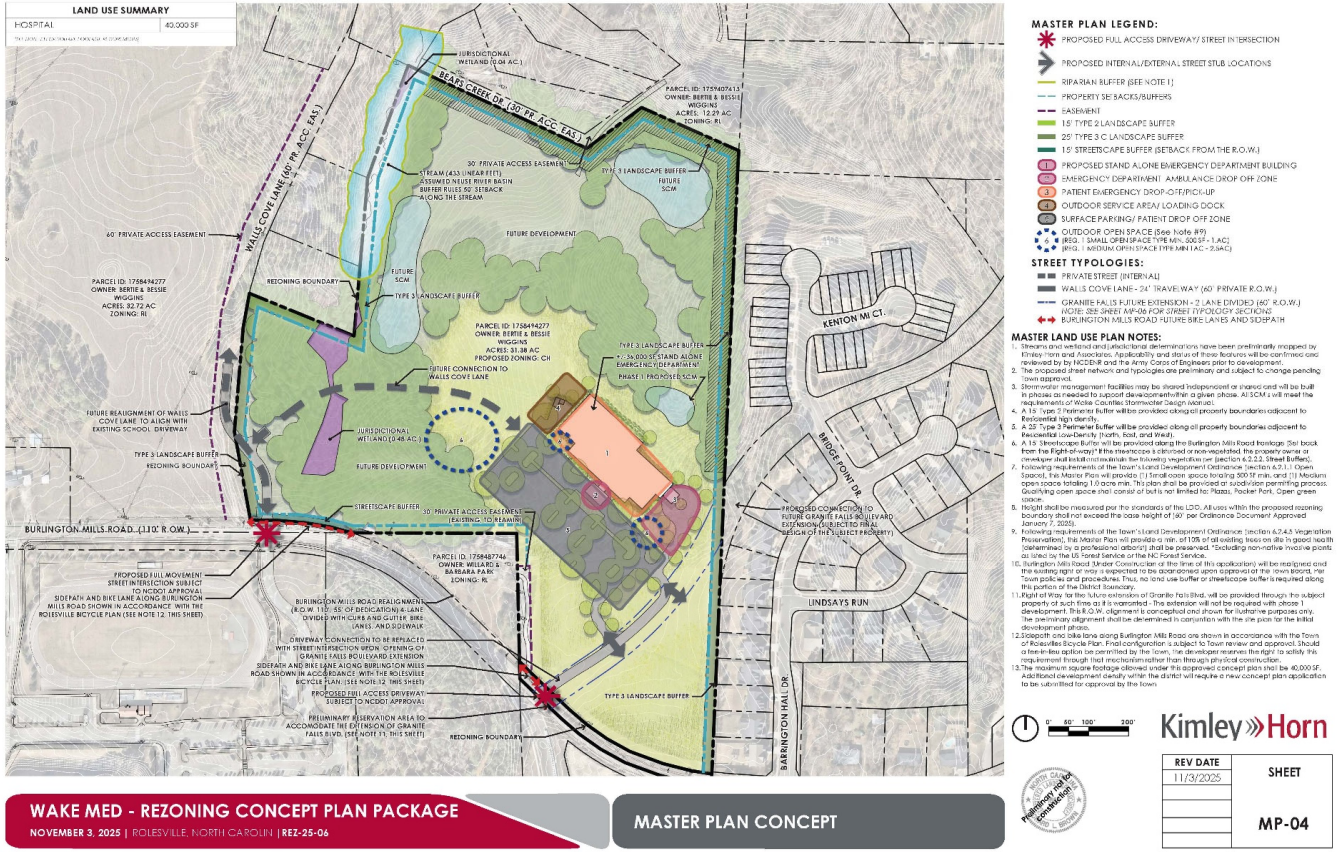


Figure 2: Near-Term (2027) Site Plan



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~~Figure 3: Long-Term (2037) Site Plan~~

Commented [MP3]: Removed per WakeMed's feedback

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~~Figure 1~~.

- Burlington Mills Road at Forestville Road
- Burlington Mills Road at Walls Cove Lane / Rolesville Middle School Driveway
- Burlington Mills Road at Old Burlington Mills Road
- Main Street at Burlington Mills Road / Virginia Water Drive

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]	2024 AADT[2] (vehicles per day)	Speed Limit (mph)	Maintenance Agency
Burlington Mills Road	SR 2051	Two-Lane Undivided	Major Collector	4,500	35-45	NCDOT
Forestville Road	SR 2049	Two-Lane Undivided	Minor Arterial	18,000	45	NCDOT
Walls Cove Lane	N/A	One-Lane	Private	No Data Available	N/A	Private
Old Burlington Mills Road	SR 2051	Two-Lane Undivided	Major Collector	No Data Available	35	NCDOT
Main Street	US 401 Business	Two-Lane w/ TWLTL*	Minor Arterial	13,500	35	NCDOT
Virginia Water Drive	N/A	Two-Lane Undivided	Local Road	No Data Available	25	Town of Rolesville
Granite Falls Boulevard	N/A	Two-Lane Undivided	Local Road	No Data Available	25	Town of Rolesville
Rogers Road	SR 2052	Two-Lane Undivided	Major Collector	10,000	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~~Figure 3~~.

2.2 PROPOSED ACCESS

Access to the site is envisioned to be provided by two access points along Granite Falls Boulevard. Access A will operate as a full-movement driveway onto Granite Falls Boulevard located approximately 400 feet north from Burlington Mills Road. However, Access A will operate as a left-in and right-out only access point as Granite Falls Boulevard terminates at this driveway. When Granite Falls Boulevard is fully-extended, this driveway will operate as a full movement access point. Access B is envisioned to be located approximately 200 feet north from Burlington Mills Road and will operate as a full-movement driveway onto Granite Falls Boulevard.

2.3 FUTURE CONDITIONS

The following sub-sections discuss the projects that are anticipated to modify the study area intersections between 2026 and the future year 2027. The future year lane configuration and traffic control for the study area intersections are illustrated in Figure 4~~Figure 4~~.

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. As of the writing of this report, construction is on-going along Main Street, but the new alignment of Burlington Mills Road is open to traffic. Pertinent plans for U-6241 can be found in the Appendix.

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 2.3.2.

2.3.3 Wallbrook

The following improvements were committed to by the Wallbrook development:

Main Street at 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

It should be noted that the improvements associated with Wallbrook are shown as existing on both Figure 3~~Figure 3~~ and Figure 4~~Figure 4~~ as these improvements have been constructed. A copy of the TIA is contained in the Appendix. The Wallbrook development is discussed in more detail in Section 3.1.3.2.

2.3.4 Wallbrook Flats

Wallbrook Flats will add a fourth-leg to the intersection of Burlington Mills Road at Old Burlington Mills Road. The following improvements were committed to by the Wallbrook Flats Development:

Burlington Mills Road at Old Burlington Mills Road

- Construct the Wallbrook Flats driveway with one ingress lane and two egress lanes consisting of an exclusive left-turn lane and a shared thru/right-turn lane.
- 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.

A copy of the TIA is contained in the Appendix. The Wallbrook Flats development is discussed in more detail in Section 3.1.3.3.

Figure 3: 2026 Existing Lanes and Traffic Control

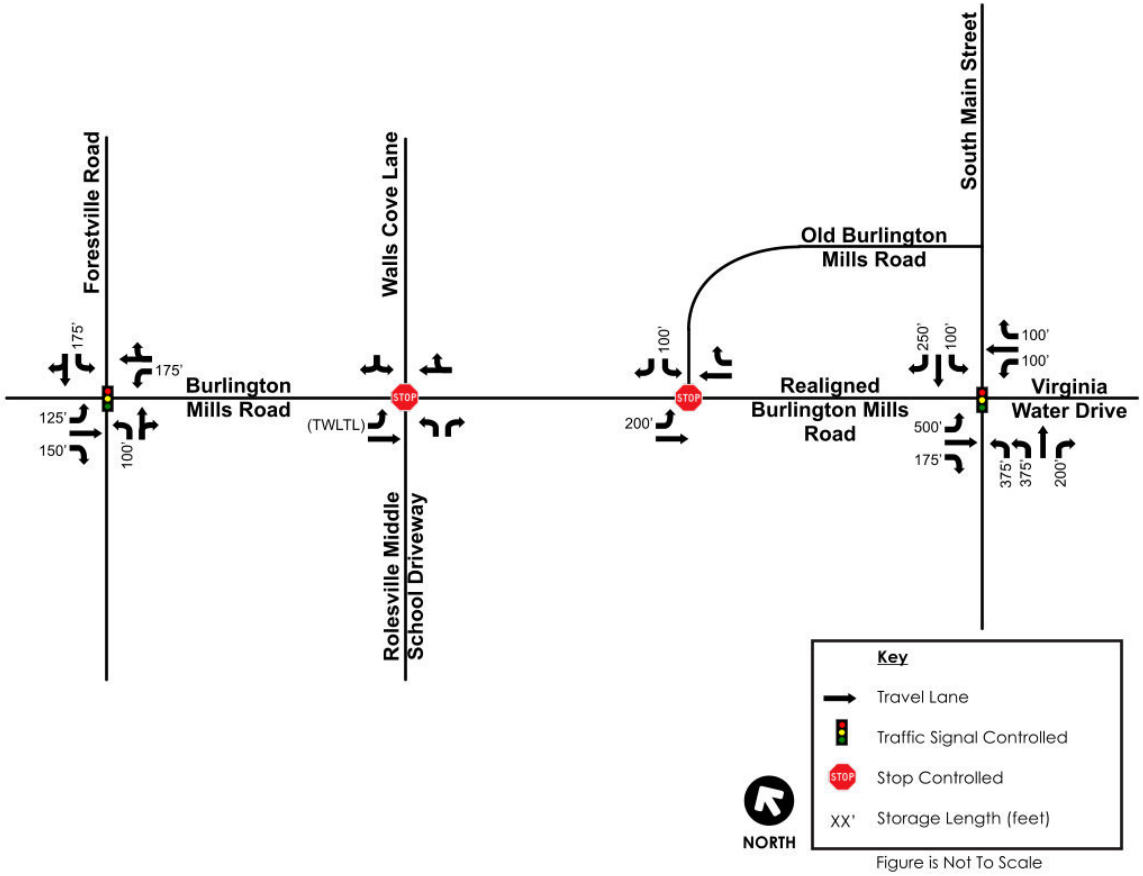
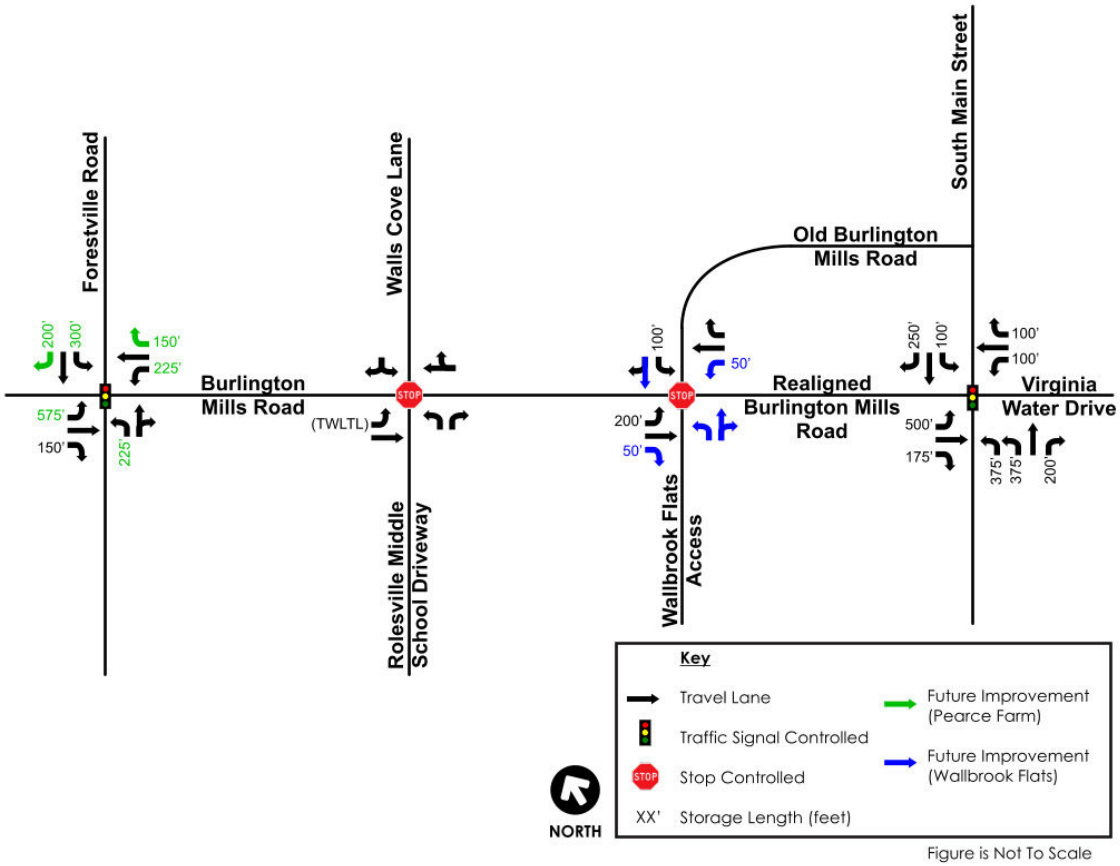


Figure 4: Near-Term (2027) No-Build Lanes and Traffic Control



3.0 NEAR-TERM (2027) ANALYSIS

3.1 TRAFFIC VOLUME DEVELOPMENT

All traffic volume calculations can be found in the Appendix.

3.1.1 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 March 5, 2026, 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 (2026) traffic volumes are shown in Figure 5~~Figure 5~~.

3.1.2 Background Traffic Growth

Background traffic growth is the increase in traffic volumes due to usage increases and non-specific growth throughout the area. The 2026 existing volumes were grown by a 1.0 percent annual rate to estimate the 2027 volumes. The growth in vehicles as a result of this future traffic growth is shown in Figure 6~~Figure 6~~.

3.1.3 Adjacent Development Traffic

There are three (3) developments proposed to be constructed within and nearby the study area: Pearce Farm (fka Tom's Creek), Wallbrook, and Wallbrook Flats. The total trips associated with these developments are shown in Figure 7~~Figure 7~~. Figures showing the individual development trips can be found in the Appendix. The following subsections highlight salient data for each of the approved developments.

3.1.3.1 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 2.3.3. To provide a conservative analysis, it was assumed that the entire project would be built out and completed by the construction of the WakeMed Rolesville development. 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.

3.1.3.2 Wallbrook

Wallbrook is a 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.

A copy of the traffic study prepared by Stantec can be found in the Appendix. Due to the size and location of Wallbrook, the traffic study partitioned the development into four (4) sites; specifically the North, South, East, and West sites where traffic was generated, distributed, and assigned to the study area individually. The development is not yet completed, but portions are currently open and operational. Land uses that are open and operational are as follows:

- 20 Townhomes located on the East Site;
- 20,000 square feet of retail located on the South Site; and
- 50,000 square feet of grocery store located on the South Site.

At the time the traffic counts were collected, no land uses on the North or West Sites were completed. Therefore, all traffic were added to the network as adjacent development traffic.

To account for future traffic to/from the East Site, the percentage of trips attributed to the twenty (20) townhome built were subtracted from the total AM and PM peak hour trips. This resulted in 244 total trips in the AM peak hour (144 entering, 100 exiting) and 244 total trips in the PM peak hour (100 entering and 144 exiting).

To account for future traffic to/from the South Site, the retail trips were reduced by twenty-eight percent (28%) as 20,000 of the total 71,400 square feet are constructed. This resulted in 230 total trips in the AM peak hour (138 entering and 92 exiting) and 286 total trips in the PM peak hour (141 entering and 145 exiting).

The improvements associated with the Wallbrook development are discussed in Section 2.3.3. Figures detailing the trips attributed to the Wallbrook development can be found in the Appendix.

3.1.3.3 Wallbrook Flats

Wallbrook Flats is a residential development project located on the south side of Burlington Mills Road west of Main Street. The proposed development is expected to consist of 264 units of multifamily housing and is anticipated to be completed in 2030. The improvements with the Wallbrook Flats development are discussed in Section 2.3.4. To provide a conservative analysis, it was assumed that the entire project would be built out and completed by the construction of the WakeMed Rolesville development. The trips attributed to the Wallbrook Flats development, as well as a copy of the traffic study prepared by Stantec are provided in the Appendix.

3.1.4 No-Build Traffic Volumes

The 2027 No-Build traffic volumes consist of the sum of the 2026 Existing traffic volumes, the Background traffic growth, and the adjacent development growth. The 2027 No-Build traffic volumes are shown in Figure 8~~Figure 8~~.

3.1.5 Trip Generation

Trip generation for the proposed development was performed using the 12th 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	Total	Enter	Exit	Total	Enter	Exit
Medical Office (LUC 720)	40,000 SF	1,550	105	82	23	142	43	99
Total Trips Generated		**1,550**	**105**	**82**	**23**	**142**	**43**	**99**

3.1.6 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.

- 30% to/from the north on Main Street
- 25% to/from the north on Forestville Road
- 20% to/from the south on Main Street
- 10% to/from the west on Burlington Mills Road
- 10% to/from the east on Virginia Water Drive
- 5% to/from the south on Forestville Road

The trip distribution for the proposed development is shown in Figure 9. The trip assignment is shown in Figure 10.

3.1.7 Build Traffic Volumes

The 2027 Build traffic volumes include the 2027 No-Build traffic and the proposed development traffic discussed in Sections 3.1.5 and 3.1.6. The 2027 Build traffic volumes are shown in Figure 11~~Figure 11~~.

Figure 5: 2026 Existing Traffic Volumes

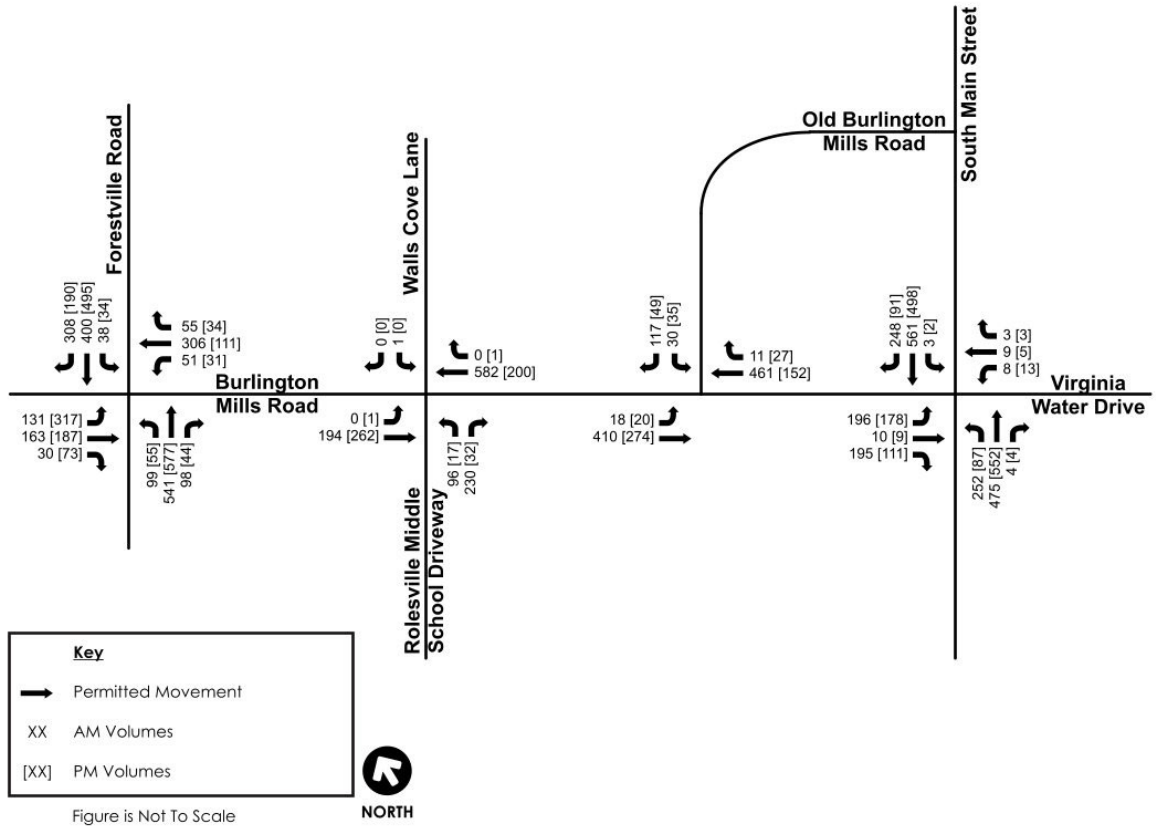


Figure 6: Near-Term (2027) Background Traffic Growth

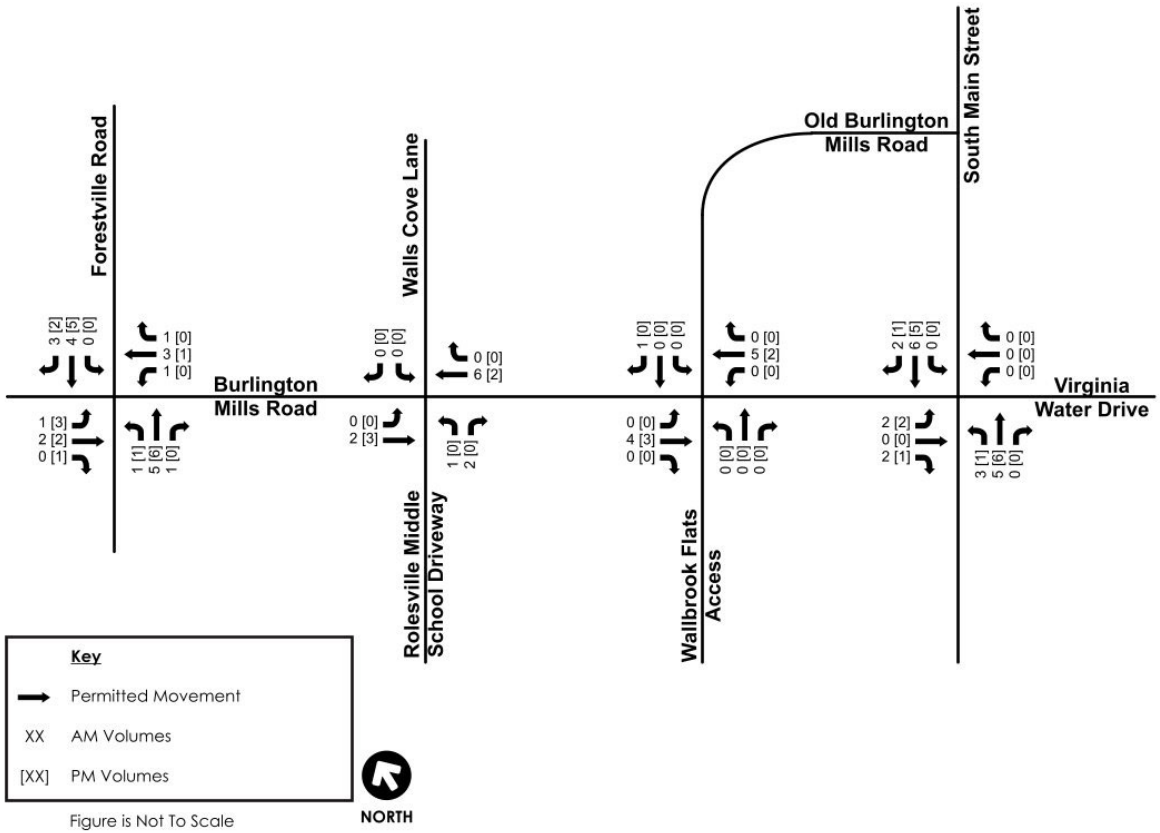


Figure 7: Near-Term (2027) Adjacent Development Traffic Volumes

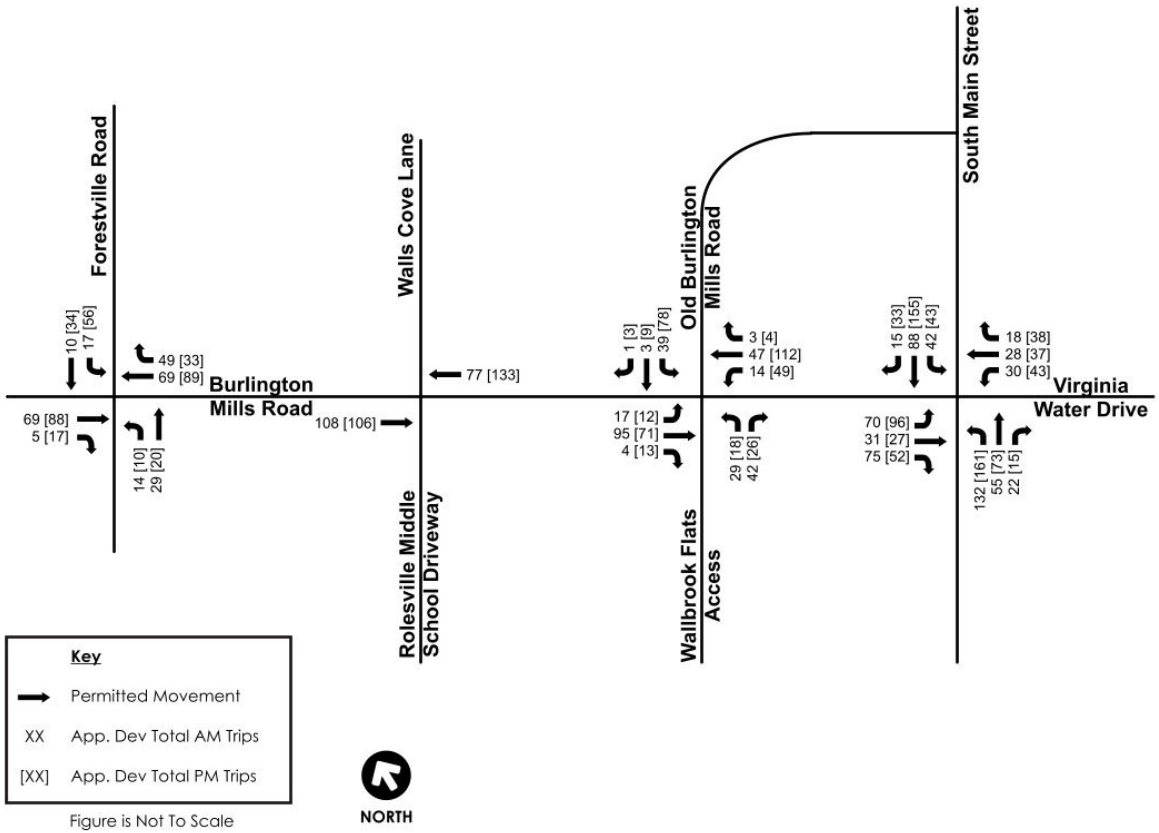


Figure 8: Near-Term (2027) No-Build Traffic Volumes

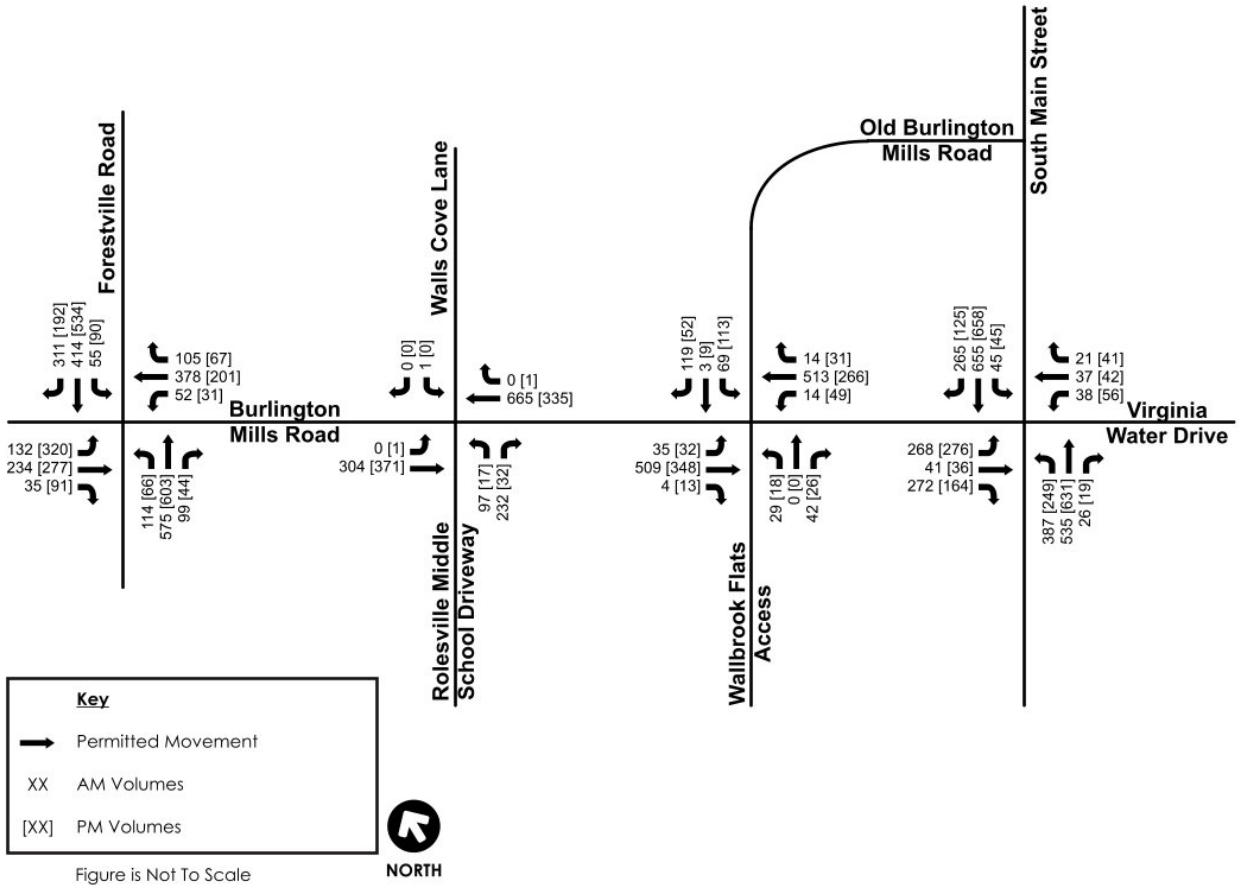


Figure 9: Near-Term (2027) Trip Distribution

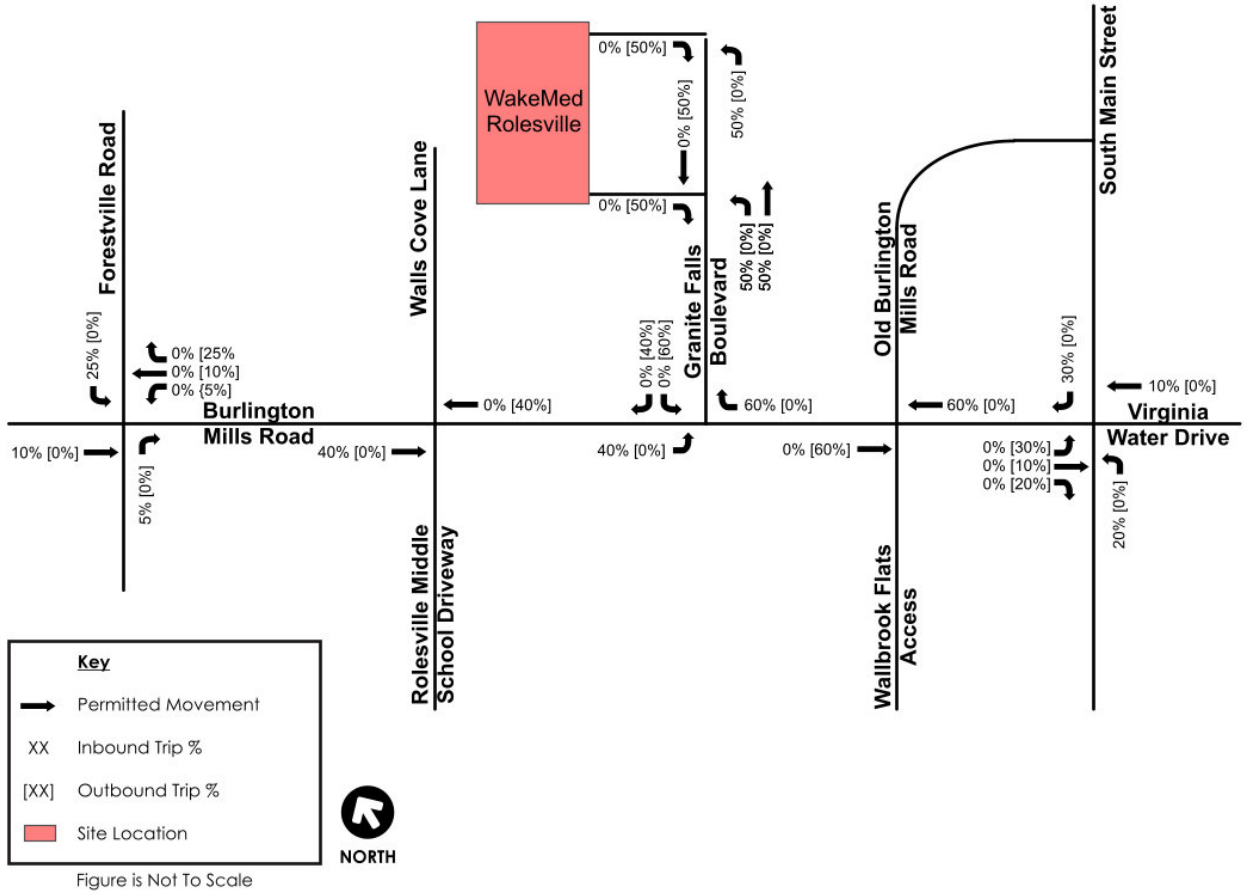


Figure 10: Near-Term (2027) Trip Assignment

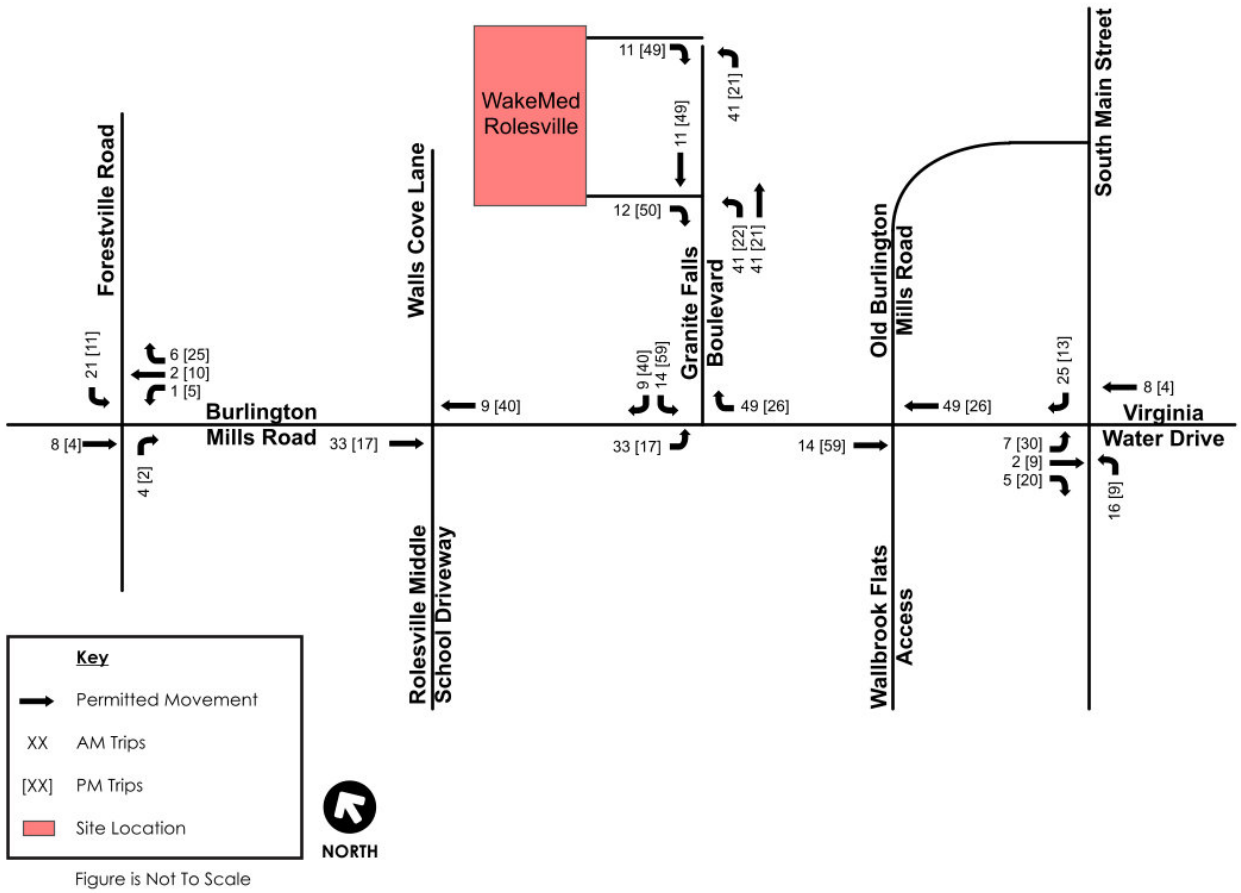
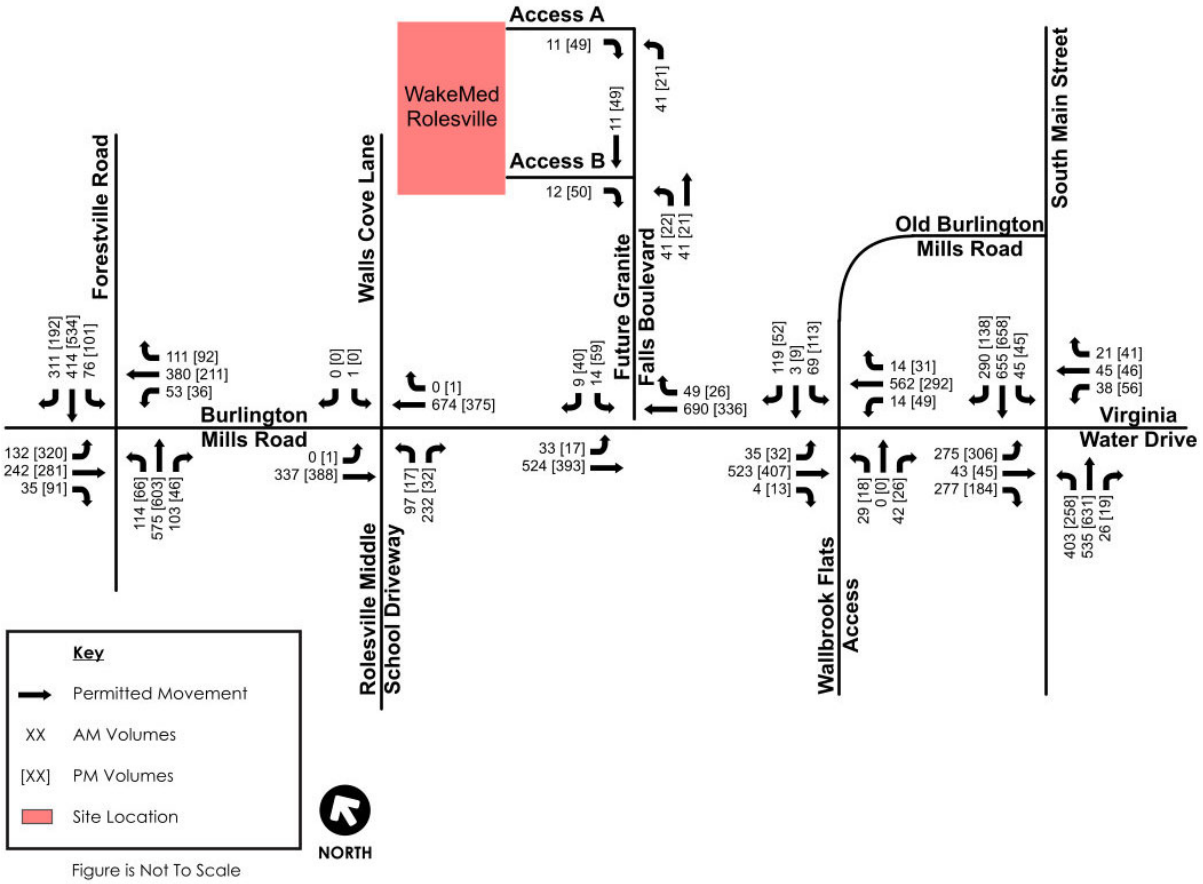


Figure 11: Near-Term (2027) Build Traffic Volumes



3.2 NEAR-TERM (2027) CAPACITY ANALYSIS

Capacity analyses were performed for the roadway network in the study area. The traffic analysis program Synchro Version 12 was used to analyze all signalized and stop-controlled intersections according to methods put forth by the Transportation Research Board's Highway Capacity Manual[5] (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*[6] as well as the *Draft NCDOT Capacity Analysis Guidelines Best Practices*[7]. 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)[8], 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.*

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

3.2.1 2026 Existing

In the base year under the existing geometric conditions, all study intersections operate at an overall acceptable LOS. It should be noted that at Burlington Mills Road at Forestville Road, the westbound thru/right movement operates at LOS F in the AM and PM peak hours, with the southbound thru/right movement operating at LOS E in the AM peak hour. Additionally, at Burlington Mills Road at Main Street, the eastbound left operates at LOS F and LOS E in the AM and PM peak hours; respectively, with the westbound thru movement operating at LOS E in the AM peak hour. The results from the existing analysis of 2026 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: 2026 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		52.0	42.5	D	D				
		EB	L	54.3	52.0	D	D	173	378	149	150
			T	40.6	41.2	D	D	191	227	252	155
			R	26.9	28.0	C	C	41	86	117	175
		WB	L	27.8	30.9	C	C	61	43	200	118
			TR	82.1	90.0	F	F	508	244	772	248
		NB	L	33.4	16.0	C	B	100	37	125	124
			TR	36.5	29.5	D	C	704	583	606	539
		SB	L	13.4	11.7	B	B	30	26	199	200
			TR	60.2	45.8	E	D	858	756	1187	702
	Burlington Mills Road at Walls Cove Lane / Rolesville MS	EB	L	8.9	7.7	A	A	0	0	20	20
		NB	L	27.1	13.1	D	B	45	3	99	35
			R	11.3	10.1	B	B	33	3	165	54
		SB	LR	19.0	11.4	C	B	3	0	30	30
	Burlington Mills Road at Old Burlington Mills Road	EB	L	8.6	7.6	A	A	3	0	36	33
		SB	L	21.9	12.4	C	B	13	5	50	40
			R	12.1	9.2	B	A	20	5	79	42
	Burlington Mills Road at Main Street	Overall		29.6	23.5	C	C				
		EB	L	88.7	66.4	F	E	420	255	288	241
			T	52.7	52.1	D	D	28	26	179	75
			R	40.8	44.4	D	D	185	143	194	167
		WB	L	52.0	44.4	D	D	25	28	35	48
			T	55.6	55.0	E	D	26	19	44	29
			R	48.0	48.0	D	D	14	14	30	49
		NB	L	52.2	54.7	D	D	150	66	301	98
			T	8.1	9.3	A	A	288	370	426	327
			R	1.8	3.0	A	A	2	4	61	17
		SB	L	55.0	55.0	D	D	16	16	57	36
			T	21.9	15.6	C	B	481	345	596	338
			R	6.8	3.6	A	A	141	40	275	210

Intersection or Lane Group Operates at LOS E
Intersection or Lane Group Operates at LOS F

3.2.2 2027 No-Build

In the 2027 No-Build conditions, the analysis assumes the improvements associated with the adjacent developments and NCDOT projects are constructed. These improvements, discussed in Section 2.3, are also shown on Figure 4~~Figure 4~~:

In the future year of 2027, without the proposed development in place, the intersection of Burlington Mills Road at Forestville Road is projected to operate at an overall LOS D both peak hours with individual movements operating at LOS E and F. The intersection of Burlington Mill Road at Main Street is projected to operate at an overall LOS E in the AM and PM peak hours, with individual movements operating at LOS E and F.

At the unsignalized intersection of Burlington Mill Road at Walls Cove Lane / Rolesville Middle School, the northbound left-turn from the middle school onto Burlington Mills Road operates at LOS E in the AM peak hour. This is attributed to traffic to / from Rolesville Middle School. At the unsignalized intersection of Burlington Mills Road at Old Burlington Mills Road / Wallbrook Flats Driveway, the northbound and southbound left-turns onto Burlington Mills Road operate at LOS F in the AM peak hour. This is attributed to high thru volumes on Burlington Mills Road due to traffic to / from Rolesville Middle School. The southbound left turns from the Wallbrook Flats Driveway operate at LOS E in the PM peak hour. At unsignalized intersections, it is common for minor streets to experience higher delays due to the difficulty in making left-turn movements with the uninterrupted main street traffic.

Synchro LOS and delay results for the 2027 No-Build analysis scenario are listed in Table 5~~Table 5~~. Instances where the overall intersection or lane group operate at LOS E or F are highlighted in the table.

Table 5: 2027 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		41.3	41.3	D	D				
		EB	L	55.5	49.1	E	D	182	370	156	308
			T	42.5	40.1	D	D	266	311	257	328
			R	25.8	24.3	C	C	45	94	98	224
		WB	L	27.6	27.3	C	C	61	40	302	71
			T	78.7	83.8	E	F	519	308	614	293
			R	28.9	37.2	C	D	110	88	250	162
		NB	L	15.0	16.0	B	B	75	49	324	324
			TR	47.9	48.0	D	D	778	741	709	691
		SB	L	17.5	28.0	B	C	41	78	114	294
			T	27.1	34.8	C	C	355	510	388	454
			R	16.0	8.2	B	A	210	92	298	300
	Burlington Mills Road at Walls Cove Lane / Rolesville MS	EB	L	9.2	8.1	A	A	0	0	16	12
		NB	L	45.8	17.7	E	C	75	5	122	44
			R	13.0	11.0	B	B	43	5	129	54
		SB	LR	25.0	14.1	D	B	3	3	30	30
	Burlington Mills Road at Old Burlington Mills Road / Wallbrook Flats Access	EB	L	8.9	8.0	A	A	3	3	124	46
		WB	L	8.6	8.3	A	A	0	3	34	47
		NB	L	65.1	22.3	F	C	35	8	70	39
			TR	14.8	12.0	B	B	10	5	64	49
		SB	L	98.3	35.2	F	E	95	68	110	85
			TR	14.0	11.5	B	B	25	10	158	48
	Burlington Mills Road at Main Street	Overall		65.3	58.4	E	E				
		EB	L	272.9	274.9	F	F	377	407	527	409
			T	59.0	57.1	E	E	74	67	509	104
			R	71.6	40.9	E	D	259	184	263	204
		WB	L	43.6	45.8	D	D	60	82	82	110
			T	58.0	59.0	E	E	68	76	95	98
			R	39.4	41.0	D	D	38	62	55	80
		NB	L	109.7	54.9	F	D	300	152	372	386
			T	15.2	17.4	B	B	403	519	523	496
			R	5.9	5.9	A	A	17	14	141	221
		SB	L	60.3	60.3	E	E	79	79	200	200
			T	21.9	25.3	C	C	567	632	871	701
			R	5.7	8.7	A	A	71	74	350	350

Intersection or Lane Group Operates at LOS E
Intersection or Lane Group Operates at LOS F

3.2.3 2027 Build

As part of the 2027 Build analysis, the proposed driveways were added to the network as detailed in Section 2.2.

With the proposed development in place, the intersection of Burlington Mills Road at Forestville Road continues to operate at LOS D in both the AM and PM peak hours. At the intersection of Burlington Mills Road at Main Street, the overall intersection continues to operate at LOS E in both the AM and PM scenarios. Longer queues are observed on the southbound thru movement when compared to the no-build results.

At the intersection of Burlington Mills Road at Walls Cove Lane / Rolesville Middle School, the northbound left turn leaving Rolesville Middle School is projected to operate at LOS F in the AM peak hour. Similarly, at Burlington Mills Road at Old Burlington Mills Road / Wallbrook Flats Access, the northbound left turn and southbound left turn movements are anticipated to continue to operate at LOS F in the AM peak hour. At the intersection of Burlington Mills Road at Granite Falls Boulevard, the southbound shared left/right turn movement is shown to operate at LOS E in the AM peak hour.

Long delays at these unsignalized intersections 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. At Burlington Mill Road at Walls Cove Lane/ Rolesville Middle School, the northbound right lane operates at LOS B in both the AM and PM peak hours. At Burlington Mills Road at Old Burlington Mills Road/Wallbrook Flats Access, the northbound and southbound thru/right lanes operate at LOS C and B in the AM and PM peak hours; respectively.

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

- Burlington Mills Road at Forestville Road – WBT – PM peak hour
- Burlington Mills Road at Walls Cove Lane / Rolesville MS – NBL – AM peak hour
- Burlington Mills Road at Old Burlington Mills Road / Wallbrook Flats Access – NBL, SBL – AM peak hour
- Burlington Mills Road at Main Street – EBL – AM and PM peak hours

Synchro LOS and delay results for the 2027 Build scenario are listed in Table 6~~Table 6~~. Instances where the overall intersection or lane group operate at LOS E or F are highlighted in the table.

Table 6: 2027 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		41.7	42.6	D	D				
		EB	L	56.2	54.5	E	D	182	392	170	346
			T	43.0	42.8	D	D	275	316	274	290
			R	25.8	25.5	C	C	45	94	121	233
		WB	L	27.7	27.5	C	C	61	45	301	115
			T	78.9	81.5	E	F	521	317	601	292
			R	29.1	37.6	C	D	115	113	250	211
		NB	L	15.0	15.7	B	B	75	49	324	324
			TR	48.8	48.6	D	D	785	745	751	677
		SB	L	23.2	33.4	C	C	62	95	141	239
			T	27.1	34.8	C	C	355	510	347	527
			R	16.0	8.6	B	A	210	94	283	299
STOP	Burlington Mills Road at Walls Cove Lane / Rolesville MS	EB	L	9.6	8.2	A	A	0	0	20	19
		NB	L	66.7	18.7	F	C	100	5	108	42
			R	13.7	11.1	B	B	45	5	130	54
		SB	LR	28.8	14.5	D	B	5	3	34	39
STOP	Burlington Mills Road at Old Burlington Mills Road / Wallbrook Flats Access	EB	L	9.2	8.1	A	A	3	3	83	38
		WB	L	8.7	8.5	A	A	0	5	32	56
		NB	L	86.7	26.1	F	D	43	8	69	41
			TR	15.5	12.9	C	B	10	5	82	50
		SB	L	144.3	48.6	F	E	118	90	134	120
			TR	15.2	12.1	C	B	28	10	168	46
	Burlington Mills Road at Main Street	Overall		58.1	68.1	E	E				
		EB	L	271.2	331.9	F	F	462	399	535	517
			T	61.9	58.2	E	E	81	142	572	464
			R	44.0	41.5	D	D	312	190	270	231
		WB	L	48.1	45.4	D	D	65	77	90	99
			T	64.8	59.2	E	E	84	76	96	94
			R	43.6	40.7	D	D	41	58	65	88
		NB	L	56.2	54.7	E	D	240	156	358	274
			T	15.0	17.6	B	B	407	582	419	460
			R	5.8	6.1	A	A	18	16	170	164
		SB	L	66.1	60.3	E	E	84	79	199	199
			T	32.5	26.1	C	C	728	748	1067*	842
			R	13.4	9.0	B	A	210	93	350	350
STOP	Burlington Mills Road at Granite Falls Boulevard	EB	LT	10.3	8.2	B	A	5	0	230	68
		SB	LR	40.0	16.9	E	C	18	28	45	88
STOP	Access B at Granite Falls Boulevard	EB	LR	8.7	8.8	A	A	3	5	34	56
		NB	LT	7.3	7.4	A	A	3	0	12	19

Intersection or Lane Group Operates at LOS E

Intersection or Lane Group Operates at LOS F

* Maximum Queue extends beyond link distance

3.2.4 2027 Build Improved

Based on the findings of this study, specific improvements have been identified and should be completed as part of the proposed development. Those are listed in the following section.

3.2.4.1 Recommended Improvements

Burlington Mills Road at Granite Falls Boulevard

- Extend Granite Falls Boulevard to Burlington Mills Road with one ingress and one egress lane consisting of a shared left/right turn lane
- Construct an eastbound left turn lane on Burlington Mills Road with 50 feet of full-width storage and appropriate taper
- Construct a westbound right-turn lane on Burlington Mills Road with 50 feet of full-width storage and appropriate taper

Granite Falls Boulevard at Access A

- Construct Access A with one ingress and one egress lane consisting of a right turn lane
- Construct the northbound approach of Granite Falls Boulevard to provide a left turn lane

Granite Falls Boulevard at Access B

- Construct Access B with one ingress and one egress lane consisting of a shared left/right turn lane
- Construct the northbound approach of Granite Falls Boulevard to provide a shared left turn/thru lane

3.2.4.2 Analysis Results

The 2027 Build Improved capacity analysis results are shown in Table 7~~Table 7~~. Instances where the overall intersection or lane group operate at LOS E or F are highlighted in the table. The results of the near-term (2027) analysis, show that the proposed development accounts for a minimal increase in overall LOS at the existing study intersections with one exception. Specifically, long delays were observed for traffic turning left from the side streets at the intersection of Burlington Mills Road at Old Burlington Mills Road / Wallbrook Flats Access. The southbound left-turn increases in delay from 44 seconds per vehicle to 62 seconds per vehicle in the AM peak hour. Accordingly, the following mitigation measures were considered:

- Installation of a traffic signal
- Restricting side street access to right-turns out only

A traffic signal was considered at the intersection of Burlington Mills Road at Old Burlington Mills Road at Wallbrook Flats Access. However, this is not recommended due to the spacing between the intersection and the signalized intersection of S. Main Street at Burlington Mills Road due to the spacing between intersections.

Restricting access via a left-over which would allow side street traffic to only make right-turns was also considered. Through evaluation, this would negatively impact the intersection of Burlington Mills Road at Main Street as it would cause U-turns to occur on the eastbound approach of Burlington Mills Road.

Without improvements, left-turns are shown to incur high delays, however right-turning traffic operates with an acceptable LOS. It is common for minor streets at unsignalized intersection to experience higher delays due to the

difficulty in making a left-turn movement through the intersection with the uninterrupted main street traffic. Furthermore, the queues are largely contained within the existing turn-lanes. As a result, no improvements are recommended at this intersection. Long-term, relocating the Wallbrook Flats Access from its current location westward to where Granite Falls Boulevard intersects Burlington Mills Road should be considered.

Table 7: 2027 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
STOP	Burlington Mills Road at Granite Falls Boulevard	EB	L	10.3	8.2	B	A	5	0	40	30
		SB	LR	36.6	16.5	E	C	15	25	50	80
STOP	Access B at Granite Falls Boulevard	EB	LR	8.7	8.8	A	A	3	5	34	55
		NB	LT	7.3	7.4	A	A	3	0	16	22

Intersection or Lane Group Operates at LOS E
Intersection or Lane Group Operates at LOS F

3.3 NEAR-TERM (2027) 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~~Figure 12~~. Intersections where no improvements are recommended are locations that meet the LOS Standards specified in the LDO[8].

3.3.1 Burlington Mills Road at Granite Falls Boulevard

- Extend Granite Falls Boulevard to Burlington Mills Road with one ingress and one egress lane consisting of a shared left/right turn lane
- Construct an eastbound left turn lane on Burlington Mills Road with 50 feet of full-width storage and appropriate taper
- Construct a westbound right-turn lane on Burlington Mills Road with 50 feet of full-width storage and appropriate taper

3.3.2 Burlington Mills Road at Access A

- Construct Access A with one ingress and one egress lane consisting of a right turn lane
- Construct the northbound approach of Granite Falls Boulevard to provide a left turn lane

3.3.3 Burlington Mills Road at Access B

- Construct Access B with one ingress and one egress lane consisting of a shared left/right turn lane
- Construct the northbound approach of Granite Falls Boulevard to provide a shared left turn/thru lane

Figure 12: Near-Term (2027) Recommended Improvements

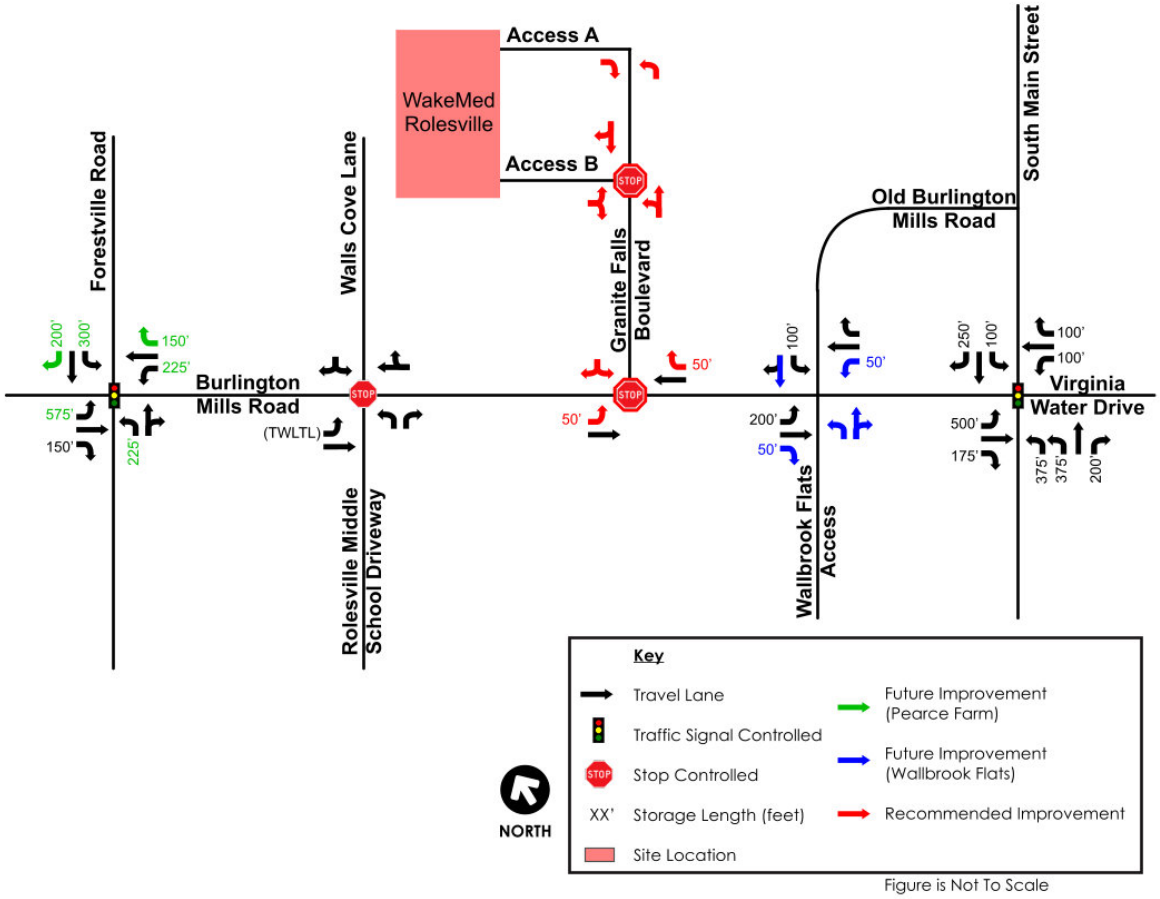


Figure is Not To Scale

4.0 LONG-TERM (2037) ANALYSIS

The Town of Rolesville has requested that the study include a long-term scenario that analyzes traffic if the following two (2) developments occur:

1. The site is fully build-out as a 486,921 SF hospital.
2. Granite Falls Boulevard is extended.

Commented [MP4]: Revised per WakeMed's comments

The square footage noted above is the result of a development study to determine how well the available land could accommodate a freestanding emergency center growing into a full-service community medical center. It should be noted that the current proposal consists of a 36,000 SF facility and that the current rezoning limits the development to 40,000 SF. If any development beyond 40,000 SF is proposed, the rezoning and conditions would have to be revisited. The intent of the long-term analysis is to forecast traffic in the immediate vicinity of the development of (1) Granite Falls Boulevard is extended and (2) further development occurs on-site. This further development is not based upon guidance or feedback from WakeMed. Rather, is a result of a development study to determine how well the available land could accommodate a freestanding Emergency Center growing into a full-service community medical center. The site development study focused on site test fit plans with building massing blocks based upon projected areas from the generation of a high-level space and parking program. The development study is included in the Appendix. This information was developed and included in this report at the request of the Town for the purpose of planning for Granite Falls Boulevard and is not associated with WakeMed's proposal.

This analysis assumes a future year of 2037 (i.e. 10 years following the initial buildout) and examines the following scenarios for the AM and PM peak hours:

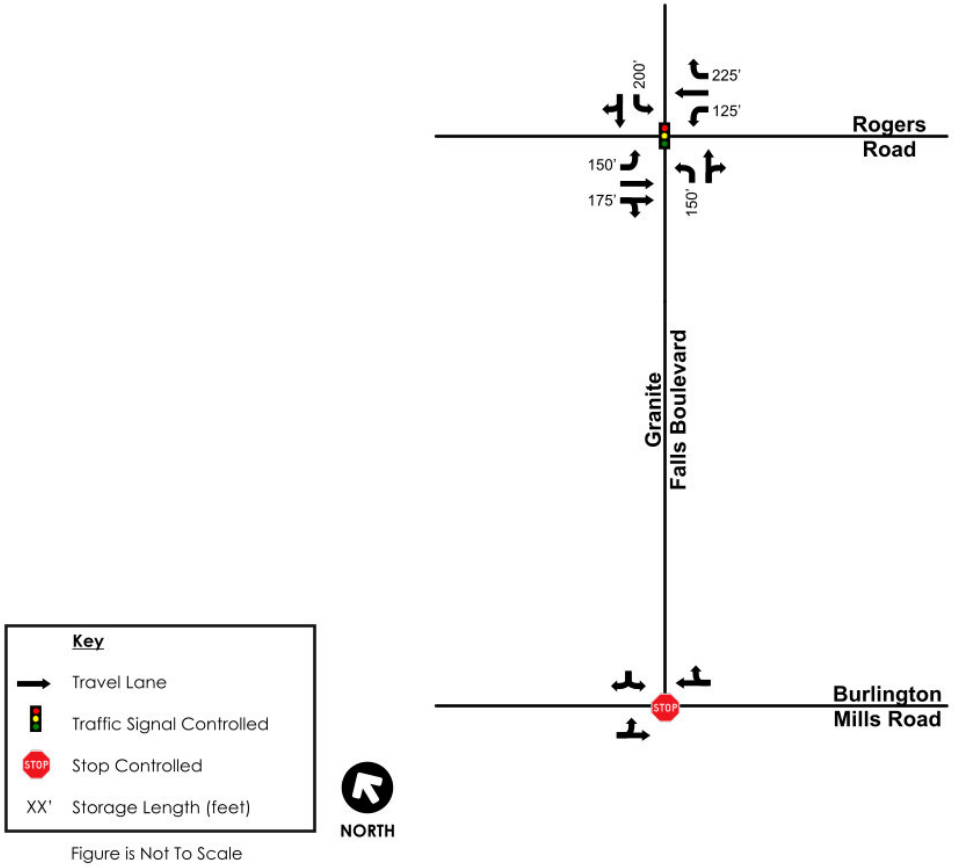
- 2037 No-Build
- 2037 Build
- 2037 Build Improved

Capacity analysis for the long-term scenario for the AM and PM peak hours was performed for the following intersections:

- Burlington Mills Road at Granite Falls Boulevard
- Rogers Road at Granite Falls Boulevard

The future year (2037) lane configuration and traffic control for the study area intersections are illustrated in Figure 13~~Figure 13~~.

Figure 13: Long-Term (2037) No-Build Lanes and Traffic Control



4.1 TRAFFIC VOLUME DEVELOPMENT

All traffic volume calculations can be found in the Appendix.

4.1.1 Data Collection

Data collection occurred on March 5, 2026 as discussed in Section 3.1.1. In addition to the previous intersections mentioned in Section 2.1, the following intersections were counted to determine the impact of the Granite Falls Extension on the surrounding intersections:

- Rogers Road at Granite Falls Boulevard
- Rogers Road at Main Street

All traffic count data can be found in the Appendix. These additional intersections existing year (2026) traffic volumes are shown in Figure 14.

4.1.2 Background Traffic Growth

Background traffic growth is the increase in traffic volumes due to usage increases and non-specific growth throughout the area. The 2026 existing volumes were grown by a 1.0 percent annual rate to estimate the 2037 volumes. The growth in vehicles as a result of this future traffic growth is shown in Figure 15.

4.1.3 Adjacent Development Traffic

There are three (3) developments proposed to be constructed within and nearby the study area: Pearce Farm (fka Tom's Creek), Wallbrook, and Wallbrook Flats, as previously discussed in Sections 2.3 and 3.1.3. The total trips associated with these developments are shown in Figure 16. Figures showing the individual development trips can be found in the Appendix.

4.1.4 Granite Falls Boulevard Extension Redistribution

The summation of the 2026 existing traffic volumes, background traffic growth to 2037, and the adjacent development traffic volumes are the 2037 no-build traffic without Grante Falls Boulevard completed. When Granite Falls Boulevard is fully constructed, it will provide a continuous connection from Burlington Mills Road to Terrell Drive in the Terrell Planation neighborhood parallel to Main Street. This new connection is anticipated to redistribute a portion of traffic from Main Street to Granite Falls Boulevard.

Traffic data collection occurred on March 5, 2026 as discussed in Section 3.1.1 at the following locations:

- Rogers Road at Granite Falls Boulevard
- Rogers Road at Main Street
- Main Street at Burlington Mills Road
- Burlington Mills Road at Old Burlington Mills Road

It should be noted that the intersection of Rogers Road at Main Street is not included as part of the study area for the near-term and long-term analyses. Traffic data was collected at this location to assess the amount of traffic turning to

/ from Rogers Road and Main Street. Traffic was also balanced along Rogers Road, Main Street, and Burlington Mills Road.

An Origin-Destination (O-D) matrix was created for both the AM/PM peak hours to all the entry and exit nodes at the five study intersections. Using the O-D matrix, each O-D pair of trips were distributed within the new network with the Granite Falls Extension in place so that the trips would be taking the shortest possible path through the network or the path with the fewest left turn movements. If there was a tie, trips were split evenly among the two routes.

Following the redistribution, the volume imbalances were added back in to the network to provide a more accurate representation of volume differences that may occur due to the road connections and driveways in between the study intersections. The redistributed trips resulting from the extension of Granite Falls Boulevard are shown in Figure 17.

4.1.5 No-Build Traffic Volumes

The 2037 No-Build traffic volumes consist of the sum of the 2026 Existing traffic volumes, the Background traffic growth, the adjacent development growth, and the redistributed traffic volumes due to the Granite Falls Boulevard Extension. The 2037 No-Build traffic volumes are shown in Figure 18.

4.1.6 Trip Generation

4.1.6.1 Site Assessment

A site development study was performed to estimate the development potential of the site. Specifically, how well the available land could accommodate a freestanding Emergency Center growing into a full-service community medical center. The site development study focused on site test fit plans with building massing blocks based upon projected areas from the generation of a high-level space and parking program. The planning study explored land use for the remaining site, relative to the freestanding Emergency Center, which is anticipated to be developed first. Two additional phases explored growth of a hospital, Medical Office Building / Ambulatory Care Center (MOB/ACC), central utility plant (CUP), and related visitor and staff parking. The study explored the ideal placement of buildings over the two additional phases of growth, location of projected inpatient and outpatient services, internal vehicular circulation, and where the site could accommodate surface parking and structured parking as needed. For purposes of calculating building gross space and parking demand, projected key planning units (KPU's) were assumed for the freestanding Emergency Center as well as each hospital service. Based upon the available acreage for potential development and considering site constraints of topography, drainage, retention ponds, setback, curb cuts, and building height restrictions, it appears the site could accommodate a four story hospital up to approximately 150 beds and approximately 500,000 square feet. In addition, it is anticipated it could support a four-story, 100,000 sf MOB/ACC, visitor surface parking at the front, and up to a four story, 920 space parking garage for staff.

~~A conceptual sketch of the building potential is shown in .~~ Additional information on the site development study can be found in the Appendix. This information was developed and included in this report at the request of the Town for the purpose of planning for Granite Falls Boulevard and is not associated with WakeMed's proposal.

4.1.6.2 Trip Generation Results

Trip generation for the proposed development was performed using the 12th 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 8.

Table 8: 2037 Trip Generation

Land Use	Size	Daily	AM Peak			PM Peak		
		Total	Total	Enter	Exit	Total	Enter	Exit
Hospital (LUC 610)	487 KSF	6,626	537	365	172	544	185	359
Total Trips Generated		**6,626**	**537**	**365**	**172**	**544**	**185**	**359**

4.1.7 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.

- 20% to/from the north on Main Street
- 20% to/from the south on Main Street
- 15% to/from the north on Forestville Road
- 10% to/from the west on Rogers Road
- 10% to/from the west on Burlington Mills Road
- 10% to/from the east on Virginia Water Drive
- 5% to/from the north on Granite Falls Boulevard
- 5% to/from the east on Rogers Road
- 5% to/from the south on Forestville Road

The trip distribution for the proposed development is shown in Figure 19. The trip assignment is shown in Figure 20.

4.1.8 Build Traffic Volumes

The 2037 Build traffic volumes include the 2037 No-Build traffic and the proposed development traffic discussed in Sections 4.1.6 and 4.1.7. The 2037 Build traffic volumes are shown in Figure 21.

Figure 14: 2026 Intersection Traffic Volumes

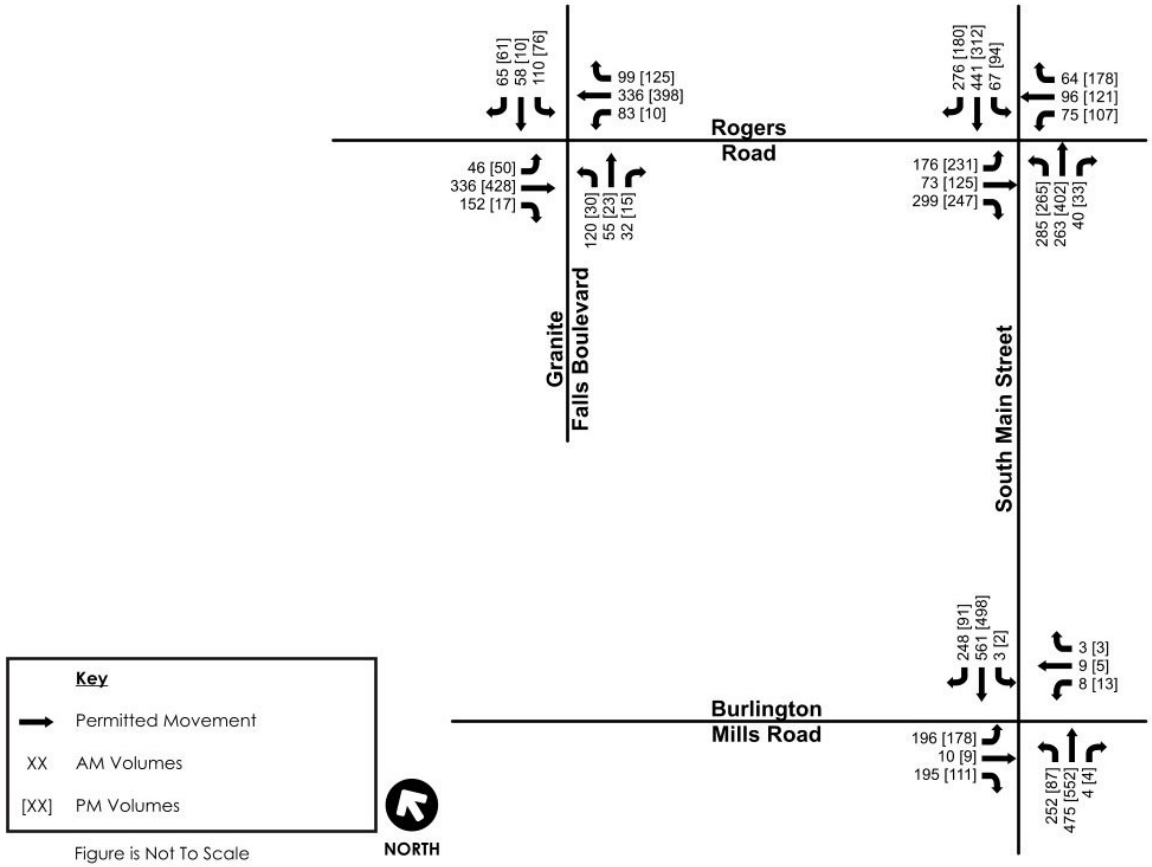


Figure 15: Long-Term (2037) Background Traffic Growth

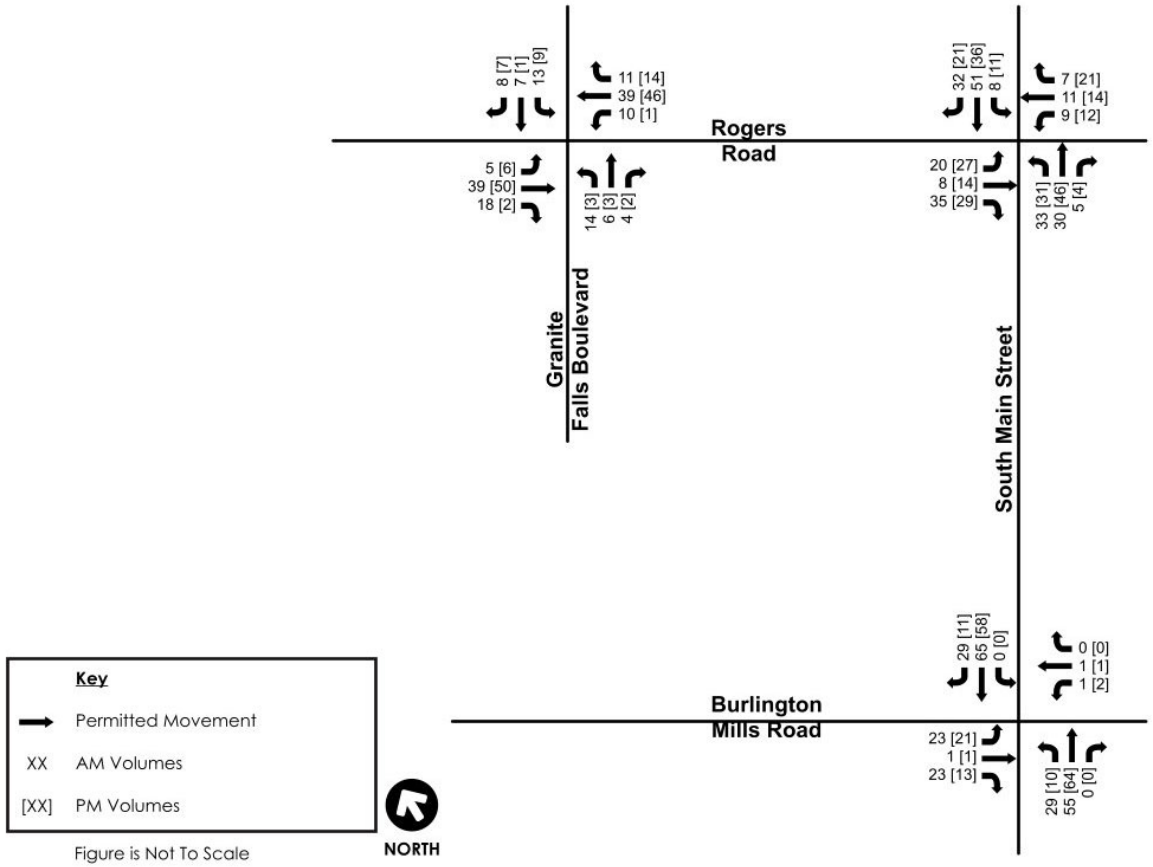


Figure 16: Long-Term (2037) Adjacent Development Traffic Volumes

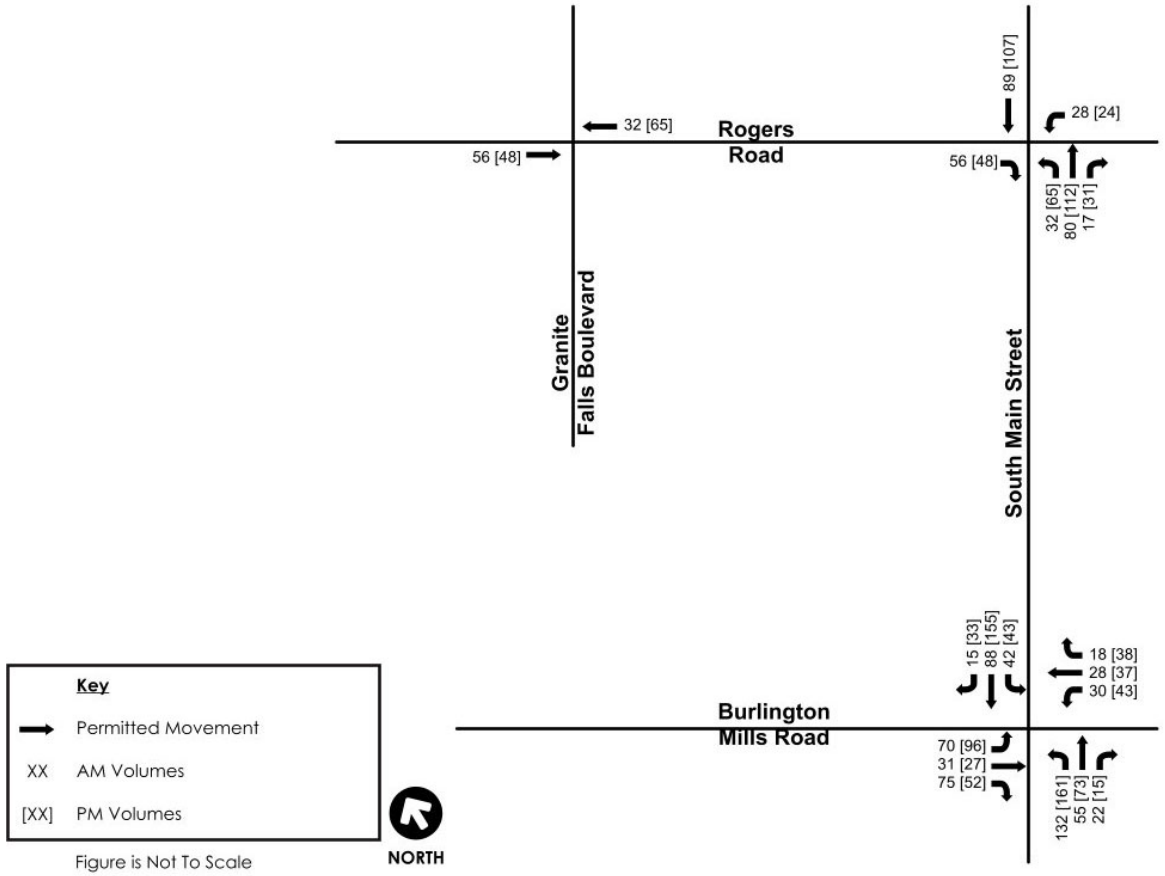


Figure 17: Long-Term (2037) Granite Falls Boulevard Extension Redistributed Traffic

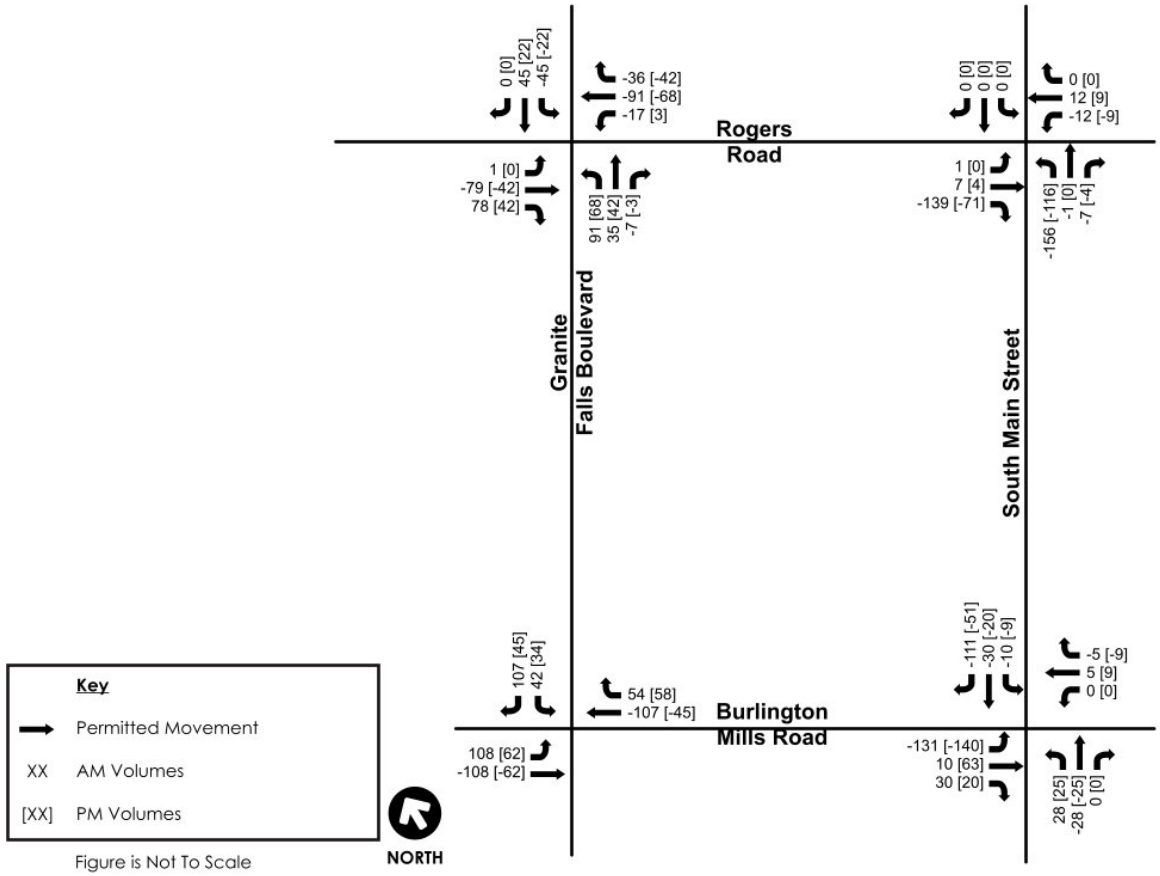


Figure 18: Long-Term (2037) No Build Traffic Volumes

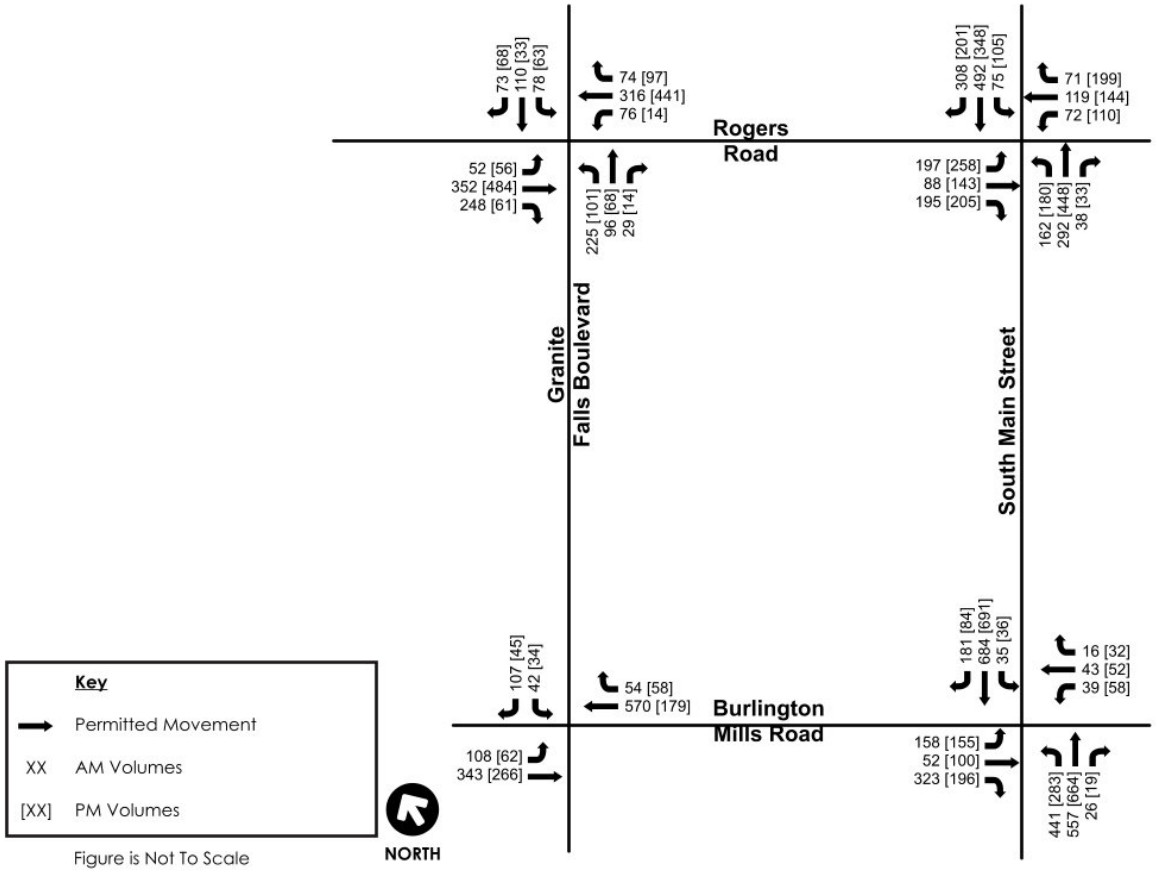


Figure 19: Long-Term (2037) Trip Distribution

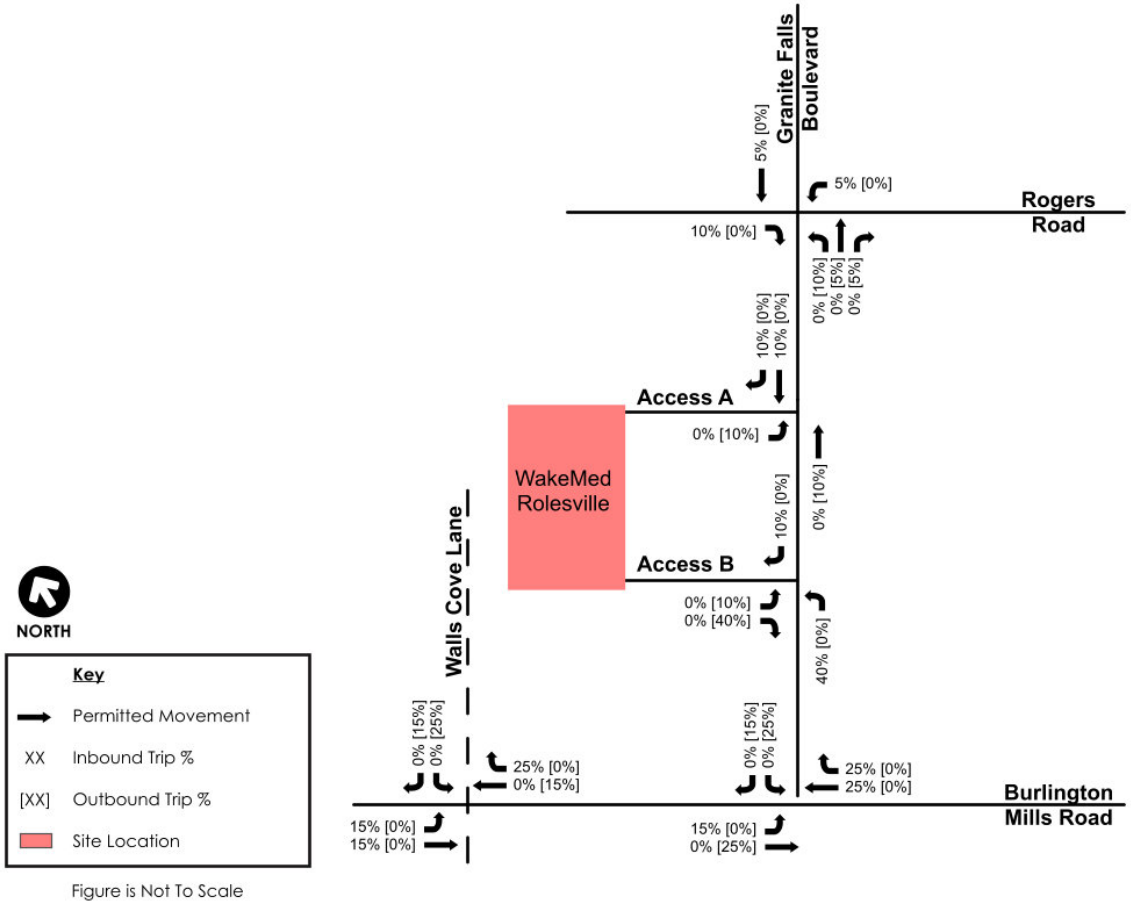


Figure 20: Long-Term (2037) Trip Assignment

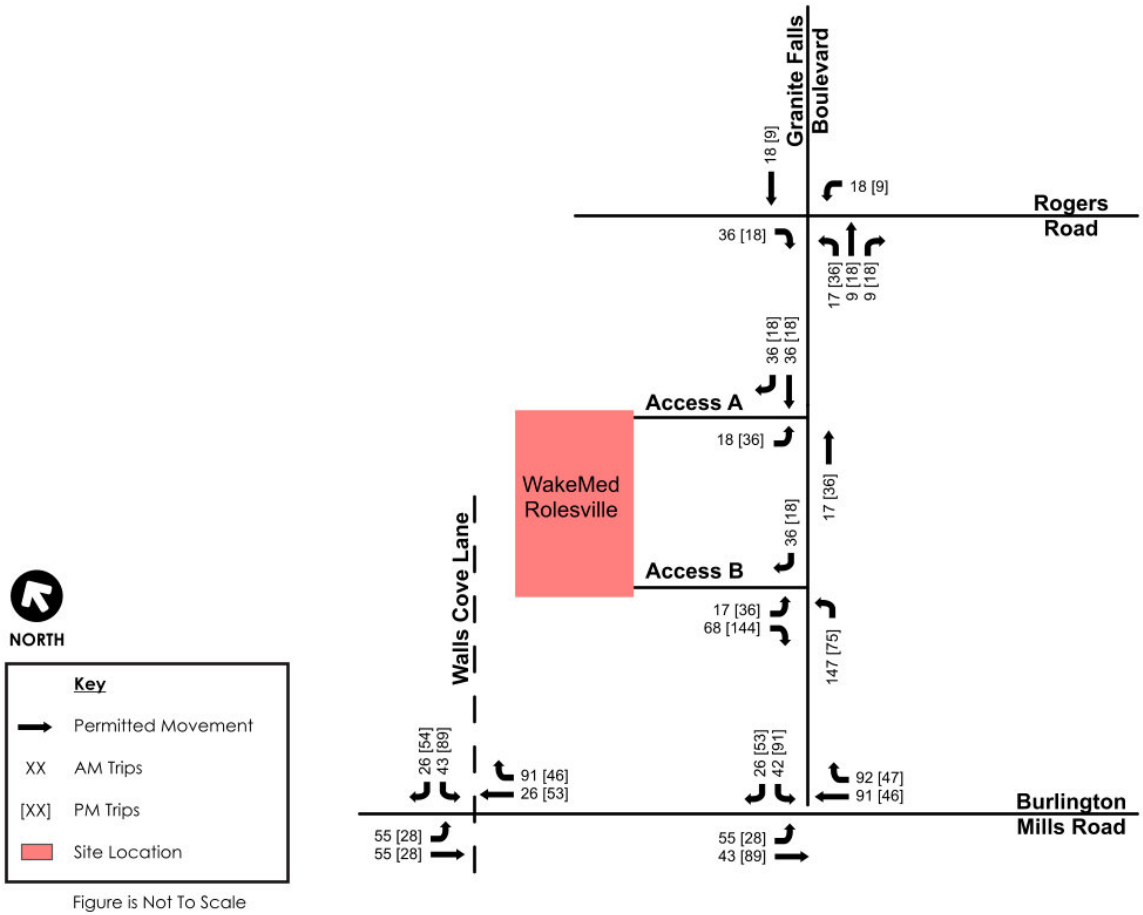
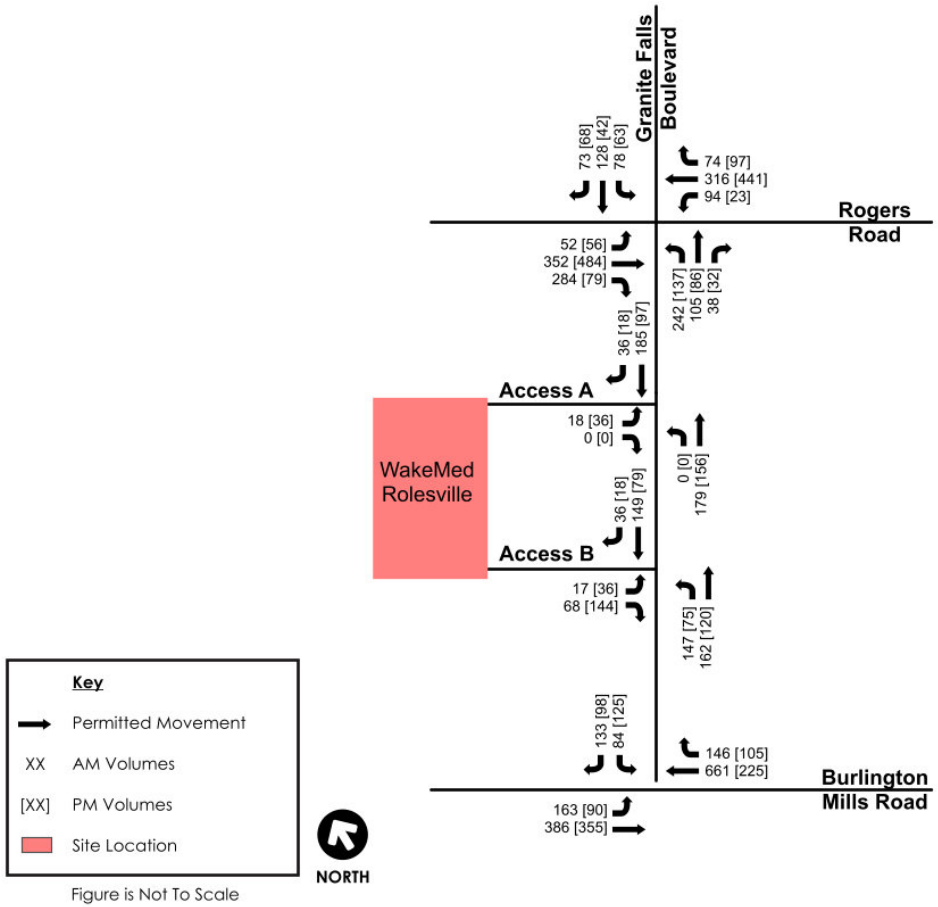


Figure 21: Long-Term (2037) Build Traffic Volumes



4.2 LONG-TERM (2037) CAPACITY ANALYSIS

Capacity analysis was performed using the methodology noted in Section 3.2. All Synchro files and detailed printouts can be found in the Appendix.

4.2.1 2037 No-Build

In the future year of 2037, without the proposed development in place, but with the extension of Granite Falls Boulevard, both study intersections are anticipated to operate at overall acceptable LOS. All studied movements are anticipated to operate at a LOS D or better in both the AM and PM peak hours. The results from the 2037 No Build analysis are shown in Table 9~~Table 9~~.

Table 9: 2037 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	Burlington Mills Road at Granite Falls Boulevard	EB	LT	9.6	7.9	A	A	13	5	164	58
		SB	LR	32.3	12.6	D	B	83	15	151	76
	Rogers Road at Granite Falls Boulevard	Overall		14.4	9.9	B	A				
		EB	L	10.3	5.6	B	A	34	24	73	69
			TR	10.4	4.9	B	A	133	78	168	132
		WB	L	12.3	5.2	B	A	51	9	114	35
			T	11.2	6.4	B	A	154	152	181	153
			R	9.7	5.1	A	A	41	34	85	76
		NB	L	29.7	28.1	C	C	123	72	199	116
			TR	15.1	22.0	B	C	60	58	136	90
		SB	L	14.9	23.0	B	C	43	48	97	90
			TR	17.0	23.7	B	C	85	68	141	118

4.2.2 2037 Build

As part of the 2037 Build analysis, the proposed driveways were added to the network as detailed in Section 2.2.

With the proposed development in place, all study intersections operate above an acceptable LOS excluding at the intersection of Burlington Mills Road at Granite Falls Boulevard. The southbound shared left/right turn lane operates at LOS F in the AM peak hour, increasing in delay from an average of 32 seconds per vehicle to an average of 217 seconds per vehicle.

Synchro LOS and delay results for the 2037 Build scenario are listed in Table 10~~Table 10~~. Instances where the overall intersection or lane group operate at LOS E or F are highlighted in the table.

Table 10: 2037 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	Burlington Mills Road at Granite Falls Boulevard	EB	L	11.2	8.3	B	A	23	8	90	57
		SB	LR	217.4	25.4	F	D	340	93	220	119
STOP	Granite Falls Boulevard at Access B	EB	LR	11.3	10.6	B	B	13	23	109	94
		NB	LT	8.0	7.6	A	A	10	5	105	50
STOP	Granite Falls Boulevard at Access A	EB	LR	11.2	10.4	B	B	3	5	39	56
		NB	LT	7.7	7.5	A	A	0	0	9	9
	Rogers Road at Granite Falls Boulevard	Overall		15.4	11.5	B	B				
		EB	L	10.5	6.9	B	A	33	28	75	77
			TR	11.0	6.5	B	A	139	92	176	140
		WB	L	14.0	6.5	B	A	63	14	132	42
			T	11.5	8.3	B	A	150	174	166	167
			R	9.9	6.2	A	A	40	39	69	79
		NB	L	34.1	28.7	C	C	143	88	227	141
			TR	15.2	21.3	B	C	69	72	207	122
		SB	L	14.6	20.4	B	C	44	45	94	79
			TR	17.0	21.2	B	C	95	68	155	119

Intersection or Lane Group Operates at LOS E
Intersection or Lane Group Operates at LOS F

4.2.3 2037 Build Improved

4.2.3.1 Recommended Improvements

Burlington Mills Road at Granite Falls Boulevard

- Provide 200 feet of full width storage and appropriate taper to the eastbound left turn lane on Burlington Mills Road
- Provide 175 feet of full width storage and appropriate taper to the westbound right turn lane on Burlington Mills Road
- Construct a southbound right turn lane on Granite Falls Boulevard with 150 feet of full-width storage and appropriate taper
- Provide a full-movement signalized intersection

Granite Falls Boulevard at Access A

- Construct a northbound left turn lane on Granite Falls Boulevard with 50 feet of full-width storage and appropriate taper

Granite Falls Boulevard at Access B

- Construct a northbound left turn lane on Granite Falls Boulevard with 75 feet of full-width storage and appropriate taper

Rogers Road at Granite Falls Boulevard

- Extend the existing northbound left turn lane on Granite Falls Boulevard to 275 feet of full-width storage and appropriate taper
- Extend the existing westbound left turn lane on Rogers Road to 150 feet of full-width storage and appropriate taper

4.2.3.2 Analysis Results

The 2037 Build Improved capacity analysis results are shown in Table 11. 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[8].

With the proposed improvements in place, all intersections and movements operate at an acceptable LOS.

Table 11: 2037 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 Granite Falls Boulevard	Overall		10.5	9.6	B	A				
		EB	L	13.4	6.2	B	A	97	34	184	88
			T	6.7	6.8	A	A	117	117	162	142
		WB	T	9.6	6.0	A	A	255	72	258	118
			R	5.6	5.8	A	A	45	37	130	96
		SB	L	19.6	21.2	B	C	66	84	111	132
			R	22.7	20.8	C	C	99	70	142	102
	Granite Falls Boulevard at Access B	EB	LR	11.2	10.6	B	B	13	23	64	83
		NB	L	8.0	7.6	A	A	10	5	67	47
	Granite Falls Boulevard at Access A	EB	LR	11.1	10.4	B	B	3	5	37	62
		NB	L	7.7	7.5	A	A	0	0	12	18
	Rogers Road at Granite Falls Boulevard	Overall		14.8	11.3	B	B				
		EB	L	10.5	6.9	B	A	33	28	73	67
			TR	11.0	6.5	B	A	139	92	171	133
		WB	L	14.0	6.5	B	A	63	14	146	42
			T	11.5	8.3	B	A	150	174	161	175
			R	9.9	6.2	A	A	40	39	65	76
		NB	L	31.3	27.0	C	C	134	94	266	146
			TR	12.6	19.6	B	B	60	77	157	116
		SB	L	14.6	20.4	B	C	44	45	85	74
			TR	17.0	21.2	B	C	95	68	155	119

4.3 LONG-TERM (2037) RECOMMENDATIONS

Based on the findings of this study, specific improvements have been identified ~~and should be completed as part of the proposed development~~that could be required if future development is proposed at the subject site. These recommendations are shown in Figure 22. Intersections where no improvements are recommended are locations that meet the LOS Standards specified in the LDO[8].

4.3.1 Burlington Mills Road at Granite Falls Boulevard

- Provide 200 feet of full width storage and appropriate taper to the eastbound left turn lane on Burlington Mills Road
- Provide 175 feet of full width storage and appropriate taper to the westbound right turn lane on Burlington Mills Road
- Construct a southbound right turn lane on Granite Falls Boulevard with 150 feet of full-width storage and appropriate taper
- Provide a full-movement signalized intersection

4.3.2 Burlington Mills Road at Access A

- Construct Access A with one ingress and one egress lane consisting of a right turn lane
- Construct a northbound left turn lane on Granite Falls Boulevard with 50 feet of full-width storage and appropriate taper

4.3.3 Burlington Mills Road at Access B

- Construct Access B with one ingress and one egress lane consisting of a shared left/right turn lane
- Construct a northbound left turn lane on Granite Falls Boulevard with 75 feet of full-width storage and appropriate taper

4.3.4 Rogers Road at Granite Falls Boulevard

- Extend the existing northbound left turn lane on Granite Falls Boulevard to 275 feet of full-width storage and appropriate taper
- Extend the existing westbound left turn lane on Rogers Road to 150 feet of full-width storage and appropriate taper

Figure 22: Long-Term (2037) Recommended Improvements

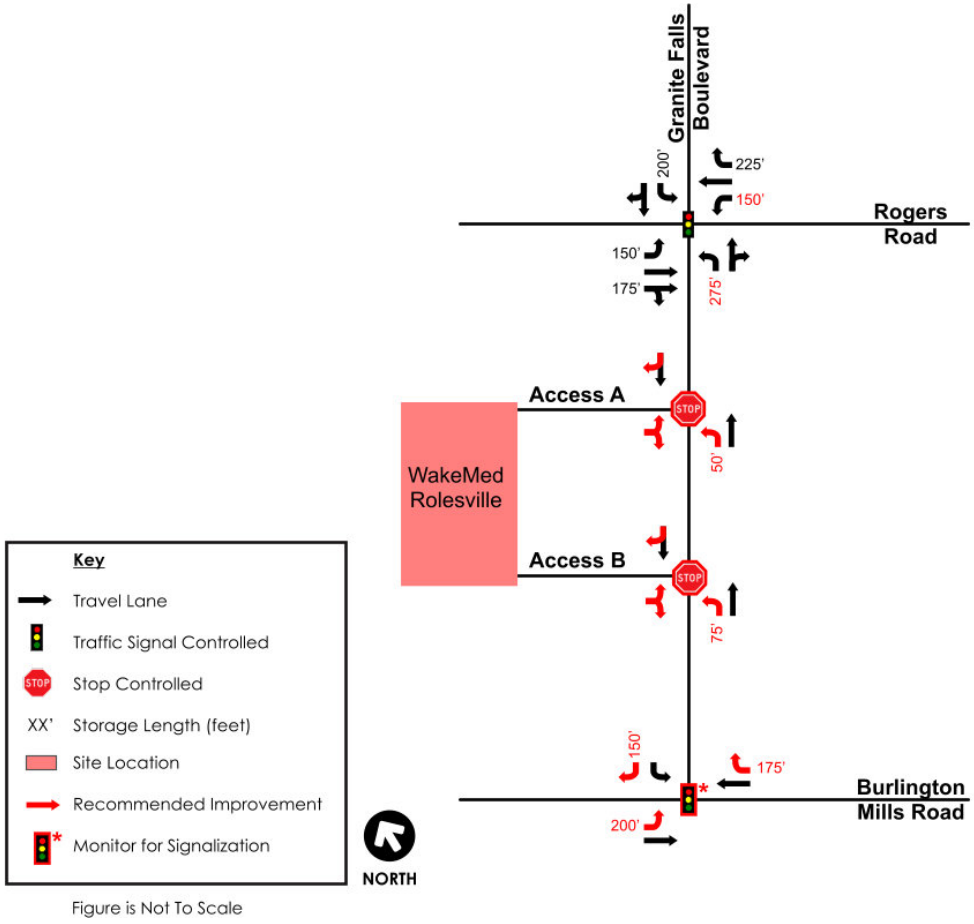


Figure is Not To Scale

5.0 REFERENCES

[1] ***NCDOT Functional Classification Map***,
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[2] ***NCDOT Average Daily Traffic Volumes***,
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[8] ***Land Development Ordinance***. Town of Rolesville, June 1, 2021,
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6.0 APPENDIX

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