



Paramount Parkway Schools
Traffic Impact Analysis

Paramount Parkway, Morrisville, NC

March 13, 2026

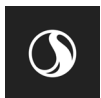
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March 13, 2026

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PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Executive Summary

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Executive Summary

The Wake County Public School System proposes to build two schools on the same campus in Morrisville, Wake County, North Carolina. When fully built out, the campus will include a new middle school (Parkside Middle) and a new location for 9th and 10th grade students attending the Wake Early College of Information & Biotechnologies (WECIB).

The schools are anticipated to be constructed by the start of the fall semester of 2028 and are located along Paramount Parkway. Parkside Middle School is designed for a capacity of 936 students whereas WECIB is designed for a capacity of 200 students.

The bell schedule for WECIB is anticipated to be 7:25 AM first bell and 2:18 PM final bell whereas the bell schedule for Parkside Middle School is anticipated to be 8:15 AM first bell and 3:00 final bell.

Access to the schools is anticipated to be provided by placing two driveways along Paramount Parkway across from existing private driveways at 4200 Paramount Parkway and 4000 Paramount Parkway. These driveways are currently full-movement and provide access to office land uses on the north side of Paramount Parkway.

This report evaluates the feasibility of the adjacent transportation system to accommodate the traffic demands associated with the new school for the Build year of 2028. Trip generation, trip distribution, and traffic analysis for the following AM High School peak (6:30 to 7:30 AM), AM Middle School peak (7:30 to 8:30 AM), PM High School peak (2:00 to 3:00 PM), and PM Middle School peak (2:30 to 3:30 PM) hours are included in this study:

- 2025 Existing;
- 2028 No-Build;
- 2028 Build; and
- 2028 Build with improvements.

Capacity analyses for the AM and PM (i.e., school PM peak) peak hours in each applicable scenario were performed for the following existing intersections:

- Paramount Parkway at Carrington Mill Boulevard;
- Paramount Parkway at 4200 Paramount Parkway / Proposed Driveway;
- Paramount Parkway at 4000 Paramount Parkway / Proposed Driveway;
- Paramount Parkway at Perimeter Park Drive;
- NC 54 (Chapel Hill Road) at Watkins Road; and
- NC 54 (Chapel Hill Road) at Carrington Mill Boulevard.

Results of the analysis indicate that the proposed schools are projected to have slight impacts on the surrounding roadway network and intersections. Accordingly, recommendations for improvement are provided.

PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Executive Summary

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RECOMMENDATIONS

Based on the findings of this study, specific improvements have been identified and should be completed as part of the proposed development.

Internal Site Layout: Parkside Middle School

- The internal driveway configuration should provide a minimum of 2298 feet of storage space to accommodate queuing vehicles. This will meet the “high demand length” requirement set by the MSTA School Traffic Calculator.

Internal Site Layout: WECIB

- The internal driveway configuration should provide a minimum of 389 feet of storage space to accommodate queuing vehicles. This will meet the “high demand length” requirement set by the MSTA School Traffic Calculator.

Paramount Parkway at Carrington Mill Boulevard

- Extend the northbound right turn lane on Carrington Mill Boulevard to 250 feet of full-width storage and appropriate taper.

Paramount Parkway at 4200 Paramount Parkway / Proposed Driveway

- Construct the proposed driveway as a restricted-movement access point with two ingress and one egress lane. Access at the driveway is recommended to be limited to left-turns in, right-turns in, and right-turns out. That is, left turns and thru out of the driveway are prohibited.
- Construct an exclusive right-turn lane with 200 feet of full-width storage and appropriate taper.

Paramount Parkway at 4000 Paramount Parkway / Proposed Driveway

- Construct the proposed driveway as a full-movement access point with one ingress and one egress lane.

Paramount Parkway at Perimeter Park Drive

- Extend the northbound left turn lane on Perimeter Park Drive to the maximum amount of full-width storage and appropriate taper without encroaching on the existing southbound left turn lane at the IQVIA Biotech intersection.

NC 54 (Chapel Hill Road) at Watkins Road

- Extend the northbound right turn lane on NC 54 (Chapel Hill Road) to 175 feet of full-width storage and appropriate taper.

NC 54 (Chapel Hill Road) at Carrington Mill Boulevard

- No improvements are recommended at this intersection.

The recommended improvements are shown in Figures ES-1.

PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Executive Summary
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Table ES-1: WECIB Peak Hours Level of Service Summary

Level of Service (Delay in seconds/vehicle)	Traffic Control	2025 Existing		2028 No-Build		2028 Build		2028 Build-Improved	
		AM	PM	AM	PM	AM	PM	AM	PM
NC 54 (Chapel Hill Road) at Carrington Mill Boulevard		B (15.2)	B (13.8)	B (12.0)	B (10.3)	B (14.9)	B (11.7)	B (14.9)	B (11.7)
Paramount Parkway at Carrington Mill Boulevard		B (10.5)	C (27.1)	B (13.1)	C (23.2)	B (10.9)	C (20.4)	B (10.9)	C (20.4)
Paramount Parkway at 4200 Paramount Parkway / Parent / Staff Driveway		A (8.9)	A (9.1)	A (8.9)	A (9.1)	B (11.3)	B (10.2)	B (11.3)	B (10.2)
Paramount Parkway at 4000 Paramount Parkway / Bus / Student / Staff Driveway		A (8.9)	A (9.1)	A (8.9)	A (8.9)	B (10.3)	B (10.1)	B (10.3)	B (10.1)
Paramount Parkway at Perimeter Park Drive		A (8.7)	C (23.6)	A (7.4)	C (21.2)	C (23.3)	C (28.9)	C (23.3)	C (28.9)
NC 54 (Chapel Hill Road) at Watkins Road		A (8.2)	B (12.8)	B (12.8)	B (19.6)	B (14.8)	C (21.3)	B (14.8)	C (21.3)

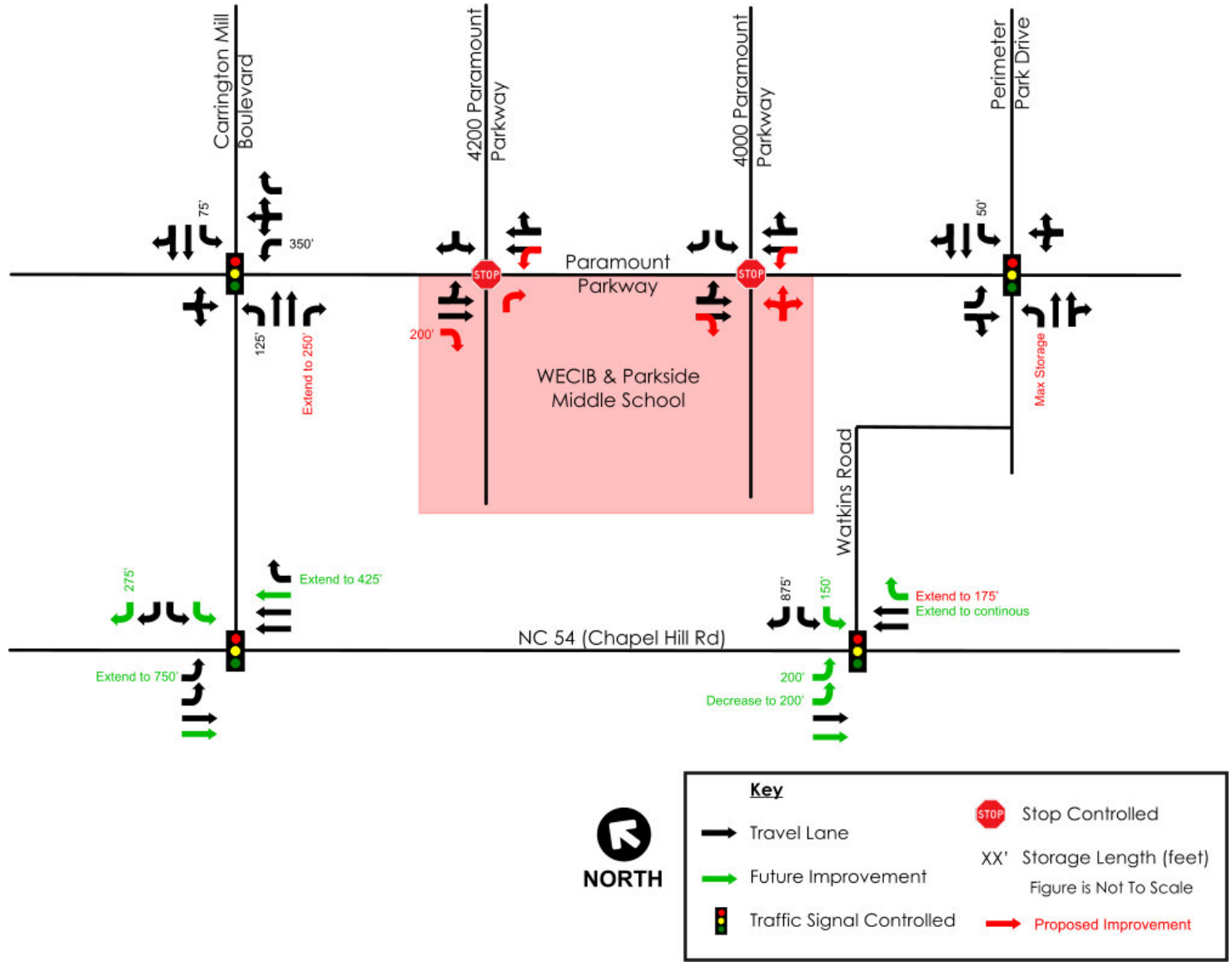
Table ES-2: Parkside Middle School Peak Hours Level of Service Summary

Level of Service (Delay in seconds/vehicle)	Traffic Control	2025 Existing		2028 No-Build		2028 Build		2028 Build-Improved	
		AM	PM	AM	PM	AM	PM	AM	PM
NC 54 (Chapel Hill Road) at Carrington Mill Boulevard		C (21.7)	B (14.3)	B (16.0)	B (10.0)	B (19.8)	B (12.7)	B (19.8)	B (12.7)
Paramount Parkway at Carrington Mill Boulevard		B (10.5)	C (32.1)	B (11.3)	C (26.4)	B (10.9)	C (20.3)	B (10.9)	C (20.3)
Paramount Parkway at 4200 Paramount Parkway / Parent / Staff Driveway		A (9.0)	A (9.0)	A (9.1)	A (8.9)	F (175.3)	B (12.0)	F (72.3)	B (11.8)
Paramount Parkway at 4000 Paramount Parkway / Bus / Student / Staff Driveway		A (9.0)	A (8.9)	A (9.1)	A (9.0)	C (15.9)	B (10.7)	C (15.9)	B (10.7)
Paramount Parkway at Perimeter Park Drive		A (7.3)	C (24.6)	A (6.9)	C (22.5)	D (51.6)	C (30.5)	D (51.6)	C (30.5)
NC 54 (Chapel Hill Road) at Watkins Road		A (7.5)	A (9.0)	B (15.6)	B (17.7)	C (22.4)	C (21.0)	C (22.4)	C (21.0)

PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Executive Summary
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Figure ES-1: Recommended Improvements



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Introduction
March 13, 2026

1.0 INTRODUCTION

The Wake County Public School System proposes to build two schools on the same campus in Morrisville, Wake County, North Carolina. When fully built out, the campus will include a new middle school (Parkside Middle) and a new location for 9th and 10th grade students attending the Wake Early College of Information & Biotechnologies (WECIB).

The schools are anticipated to be constructed by the start of the fall semester of 2028 and are located along Paramount Parkway. Parkside Middle School is designed for a capacity of 936 students whereas WECIB is designed for a capacity of 200 students.

The bell schedule for WECIB is anticipated to be 7:25 AM first bell and 2:18 PM final bell whereas the bell schedule for Parkside Middle School is anticipated to be 8:15 AM first bell and 3:00 final bell.

Access to the school is anticipated to be provided by placing two driveways along Paramount Parkway across from existing private driveways at 4200 Paramount Parkway and 4000 Paramount Parkway. These driveways are currently full-movement and provide access to office land uses on the north side of Paramount Parkway. Figure 1 shows the existing site and study area. Figure 2 shows the site plan prepared by CLH design, p.a. An electronic copy of the site plan is provided in the appendix.

This report evaluates the feasibility of the adjacent transportation system to accommodate the traffic demands associated with the school expansion for the Build year of 2028. Trip generation, trip distribution, and traffic analysis for the following AM High School peak, AM Middle School peak, PM High School peak, and PM Middle School peak hours are included in this study:

- 2025 Existing;
- 2028 No-Build;
- 2028 Build; and
- 2028 Build with improvements;

The Town of Morrisville was contacted to obtain background information and to establish the elements to be covered in this traffic impact analysis (TIA). A copy of the scoping forms and approvals can be found in the appendix.



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Introduction
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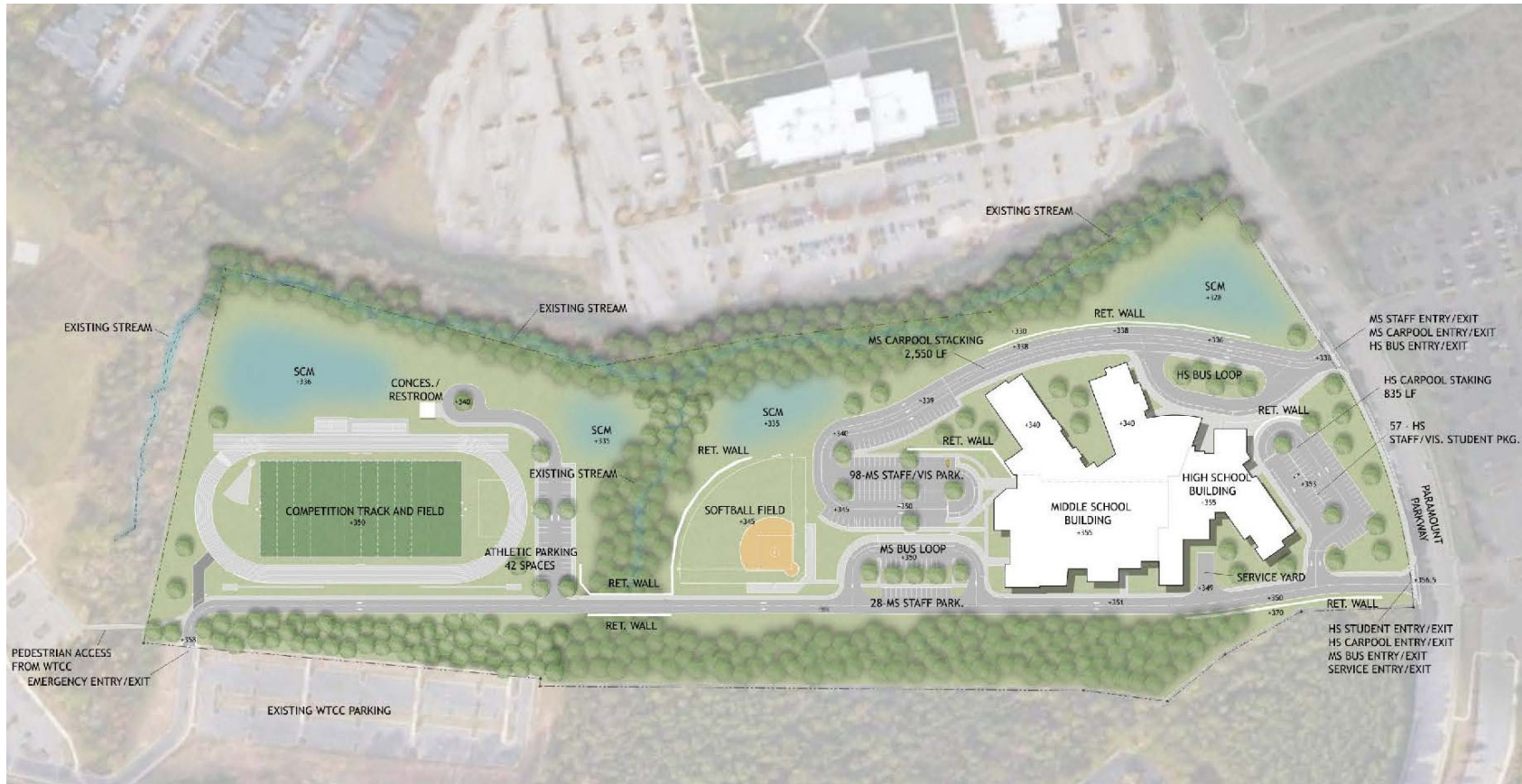
Figure 1: Site Location and Study Area



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Introduction
March 13, 2026

Figure 2: Site Plan



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Inventory of Traffic Conditions

March 13, 2026

2.0 INVENTORY OF TRAFFIC CONDITIONS

2.1 STUDY AREA

Stantec coordinated with the Town of Morrisville to determine the appropriate study area and assumptions. The final scoping document and approval emails are included in the appendix. The following existing intersections were agreed upon to be analyzed to determine the associated impacts associated with the school expansion.

- Paramount Parkway at Carrington Mill Boulevard; *(signalized)*
- Paramount Parkway at 4200 Paramount Parkway; *(stop-controlled)*
- Paramount Parkway at 4000 Paramount Parkway; *(stop-controlled)*
- Paramount Parkway at Perimeter Park Drive; *(signalized)*
- NC 54 (Chapel Hill Road) at Watkins Road; and *(signalized)*
- NC 54 (Chapel Hill Road) at Carrington Mill Boulevard. *(signalized)*

2.2 PROPOSED ACCESS

Access to the proposed campus will be provided by placing driveways across from the existing driveways at 4200 Paramount Parkway and 4000 Paramount Parkway. These driveways currently provide full-movement access to office land uses.

2.2.1 4200 Paramount Parkway

4200 Paramount Parkway, or the westernmost driveway, will provide full movement ingress and only right-out access for the following traffic:

- Middle school parents (i.e., carpool);
- Middle school staff; and
- High school buses.

2.2.2 4000 Paramount Parkway

4000 Paramount Parkway, or the easternmost driveway, will provide full movement ingress and egress access for the following traffic:

- High school parents (i.e., carpool);
- High school students;
- High school staff;
- Middle school staff;
- Middle school buses; and
- Service vehicles.



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Inventory of Traffic Conditions

March 13, 2026

2.3 EXISTING ROADWAY CONDITIONS

Table 1 provides a detailed description of the existing study area roadway network. Functional classification was taken from the Town of Morrisville Comprehensive Transportation Plan² whereas average annual daily traffic (AADT) information was obtained from NCDOT via the NCDOT.gov website.

Table 1: Existing Conditions

Road Name	Road Number	Primary Cross-Section	Functional Classification ²	2021 AADT ³ (vpd)	Speed Limit (mph)	Maintenance Agency
Paramount Parkway	-	4-Lane Undivided	Collector Street	None Reported	35	Town of Morrisville
Carrington Mill Boulevard	-	4-Lane Divided	Minor Thoroughfare	None Reported	35	Town of Morrisville
Perimeter Park Drive	-	4-Lane Divided	Minor Thoroughfare	None Reported	35	Town of Morrisville
Chapel Hill Road	NC 54	3-Lane Divided	Major Thoroughfare	21,500	45	NCDOT
Watkins Road	SR 1706	2-Lane Undivided	Minor Thoroughfare	None Reported	35	NCDOT

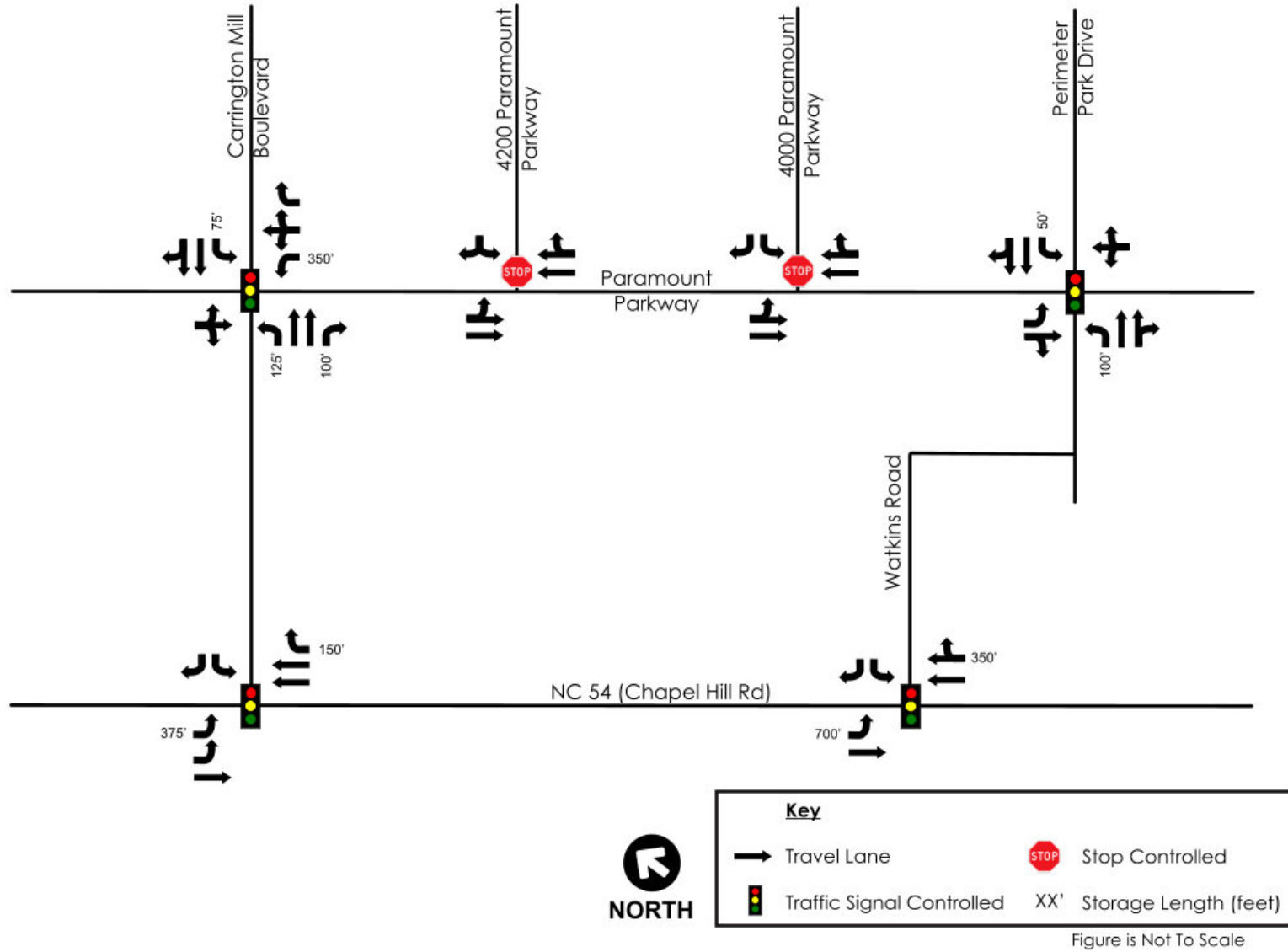
Speed limits on campus are 10 miles per hour (mph). The existing lane configuration and traffic control for the study area intersections are illustrated in Figure 3.



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Inventory of Traffic Conditions
 March 13, 2026

Figure 3: Existing Lane Configurations and Traffic Control



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Inventory of Traffic Conditions

March 13, 2026

2.4 FUTURE ROADWAY CONDITIONS

NCDOT State Transportation Improvement Program (STIP) project U-5750 seeks to widen NC 54 from Shiloh Glenn Drive to Perimeter Park Drive and provide additional turn lanes. Construction is currently anticipated to begin in 2025. Therefore, this study assumes that construction is complete in 2028. The following are modifications the project is expected to make to the study area intersections as described in the Watkins Road Development Traffic Impact Analysis (Kimley-Horn and Associates, Inc., 2021).

2.4.1 NC 54 Corridor

- Widen and reconfigure NC 54 to provide a third westbound through lane generally from Transformation Road (Wake Technical Community College driveway) through the NC 540 interchange.
- Widen and reconfigure NC 54 to provide at least one additional eastbound through lane from north of the NC 540 interchange to McCrimmon Parkway
- Widen and reconfigure NC 54 to a four-lane median divided roadway generally between Watkins Road and Perimeter Park Drive.
- Modify impacted traffic signals as necessary to accommodate the revised laneage.

2.4.2 NC 54 at Carrington Mill Boulevard

- Widen the southbound approach of Carrington Mill Boulevard to provide dual-left and right-turn lanes.
- Extend the storage of the existing inside eastbound left-turn lane on NC 54 to provide approximately 750 feet of storage.
- Provide a westbound right-turn lane on NC 54 with approximately 430 feet of storage.

2.4.3 NC 54 at Watkins Road

- Widen the southbound approach of Watkins Road to provide dual left-turn lanes and a single right-turn lane.
- Provide a westbound right-turn lane on NC 54 with approximately 140 feet of storage.
- Provide dual eastbound left-turn lanes on NC 54 with approximately 200 feet of storage.

Excerpts of the plans for U-5750 are included in the appendix.

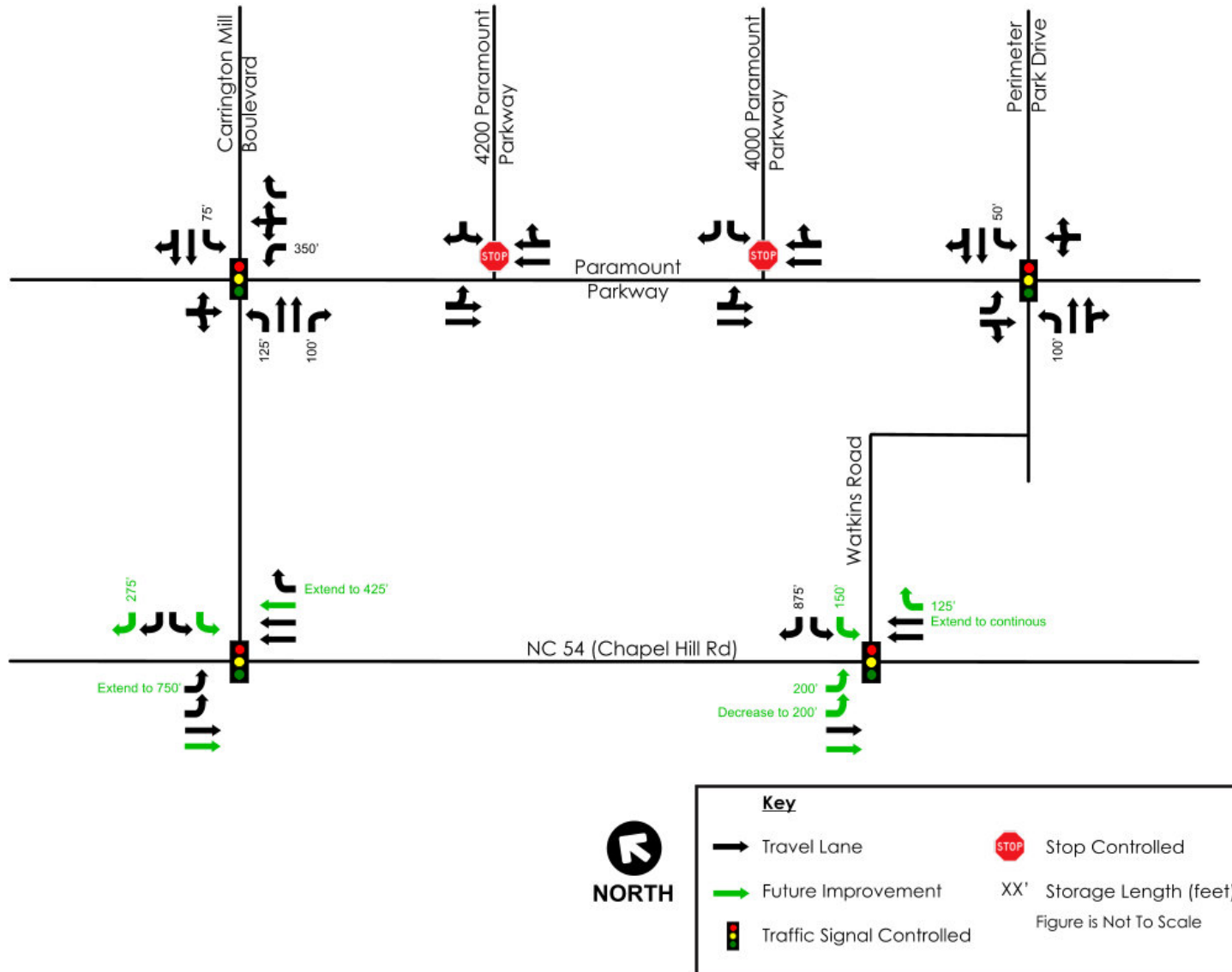
The future no build lane configuration and traffic control for the study area intersections are illustrated in Figure 4.



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Inventory of Traffic Conditions
 March 13, 2026

Figure 4: Future Lane Configurations and Traffic Control



3.0 TRIP GENERATION

Parkside Middle School is proposed to have a maximum enrollment of 936 students whereas WECIB is proposed to have a maximum enrollment of 200 students consisting of first-year students and sophomores. The NCDOT Municipal School Transportation Assistance (MSTA) School Calculator⁴ was used to estimate the traffic that would be generated by the proposed schools. Trip generation results for Parkside Middle School are shown in Table 2 whereas WECIB is shown in Table 3. It should be noted that no student drivers are assumed to be entering or exiting the WECIB campus due to the student population consisting of freshmen and sophomores only.

Table 2: Middle School Trip Generation

Category	AM Peak Hour Trips (VPH)		PM Peak Hour Trips (VPH)	
	Enter	Exit	Enter	Exit
Total Trips	439	344	170	170
<i>Parents</i>	324	324	150	150
<i>Buses</i>	20	20	20	20
<i>Staff</i>	95	0	0	0

Table 3: WECIB Trip Generation

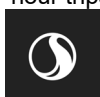
Category	AM Peak Hour Trips (VPH)		PM Peak Hour Trips (VPH)	
	Enter	Exit	Enter	Exit
Total Trips	39	21	25	25
<i>Parents</i>	18	18	22	22
<i>Buses</i>	3	3	3	3
<i>Staff</i>	18	0	0	0
<i>Student Drivers</i>	0	0	0	0

3.1 STAGGERED BELL SCHEDULE

The two schools will operate on separate bell schedules. As of the writing of this report, WECIB is anticipated to have hours from 7:25 AM to 2:18 PM whereas Parkside Middle School is expected to have hours from 8:15 AM to 3:00 PM. Accordingly, this study includes the following peak hours:

- Weekday AM peak hour from 6:30 to 7:30 to account for WECIB bell schedule.
- Weekday AM peak hour from 7:30 to 8:30 to account for Middle School bell schedule.
- Weekday school PM peak hour from 2:00 to 3:00 to account for WECIB bell schedule; and
- Weekday school PM peak hour from 2:30 to 3:30 to account for Middle School bell schedule.

Per MSTA guidelines on staggering bell schedules, WECIB AM peak hour volumes incorporated all WECIB AM peak hour trips in addition to a 25% overlap of Parkside Middle School AM peak hour trips. Parkside Middle School AM



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Trip Distribution

March 13, 2026

peak hour volumes incorporated all Parkside AM peak hour trips in addition to a 25% overlap of WECIB AM peak hour trips.

WECIB and Parkside Middle School are anticipated to have a thirty-minute overlap in PM peak hours. To account for this, WECIB PM peak hour volumes incorporated all WECIB PM peak hour trips in addition to a 50% overlap of Parkside Middle School PM peak hour trips. Parkside Middle School PM peak hour volumes incorporated all Parkside PM peak hour trips in addition to a 50% overlap of WECIB PM peak hour trips.



4.0 TRIP DISTRIBUTION

The following subsections detail the methodology used to account for future traffic to/from both schools.

4.1 NEW TRIP DISTRIBUTION AND ASSIGNMENT

Trips, as estimated by the MSTA School Calculator⁴ and discussed in section 3.0 were distributed and assigned to the study intersections separately for the parent, and bus/staff trips. These percentages were developed using the school base attendance area map, historic AADT counts, and engineering judgment. Access to the site is as follows:

- (1) driveway at 4200 Paramount Parkway. Access is recommended to be limited to left-turns in, right-turns in, and right-turns out only.
- (1) driveway at 4000 Paramount Parkway. This is recommended to be a full-movement driveway.

As a result, two trip distribution scenarios are analyzed.

4.1.1 Distribution for 4200 Paramount Parkway

- 45% entering from the south on Perimeter Park Drive
- 45% entering from the west on NC 54 (Chapel Hill Road)
- 10% entering from the north on Perimeter Park Drive
- 10% exiting to the north on Perimeter Park Drive
- 45% exiting to the south on Perimeter Park Drive
- 45% exiting from the west on NC 54 (Chapel Hill Road)

4.1.2 Distribution for 4000 Paramount Parkway

- 45 percent to/from the east on NC 54 (Chapel Hill Road);
- 45 percent to/from the west on NC 54 (Chapel Hill Road);
- 10 percent to/from the north on Perimeter Park Drive;

The proposed trip distribution for the site trips utilizing the 4200 Paramount Parkway driveway is shown in Figure 5 and the proposed trip distribution for the site trips utilizing the 4000 Paramount Parkway driveway is shown in Figure 6.

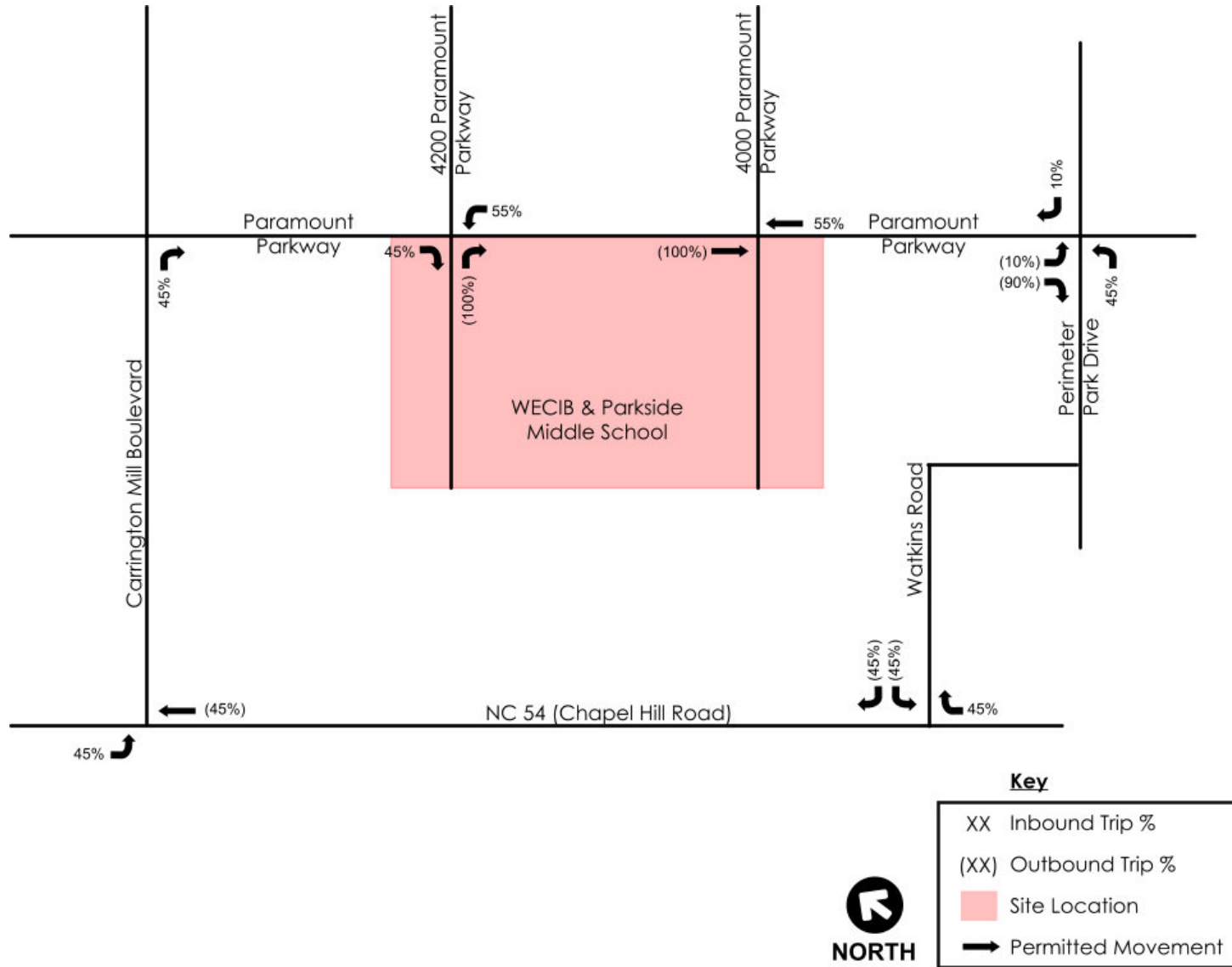
Trip assignment for WECIB and Parkside Middle School are shown in Figure 7 and Figure 8; respectively. Figures illustrating individual bus, staff, and parent trips for both for WECIB and Parkside Middle School can be found in the appendix.



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Trip Distribution
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Figure 5: Trip Distribution: 4200 Paramount Parkway Driveway



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Trip Distribution
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Figure 6: Trip Distribution: 4000 Paramount Parkway Driveway

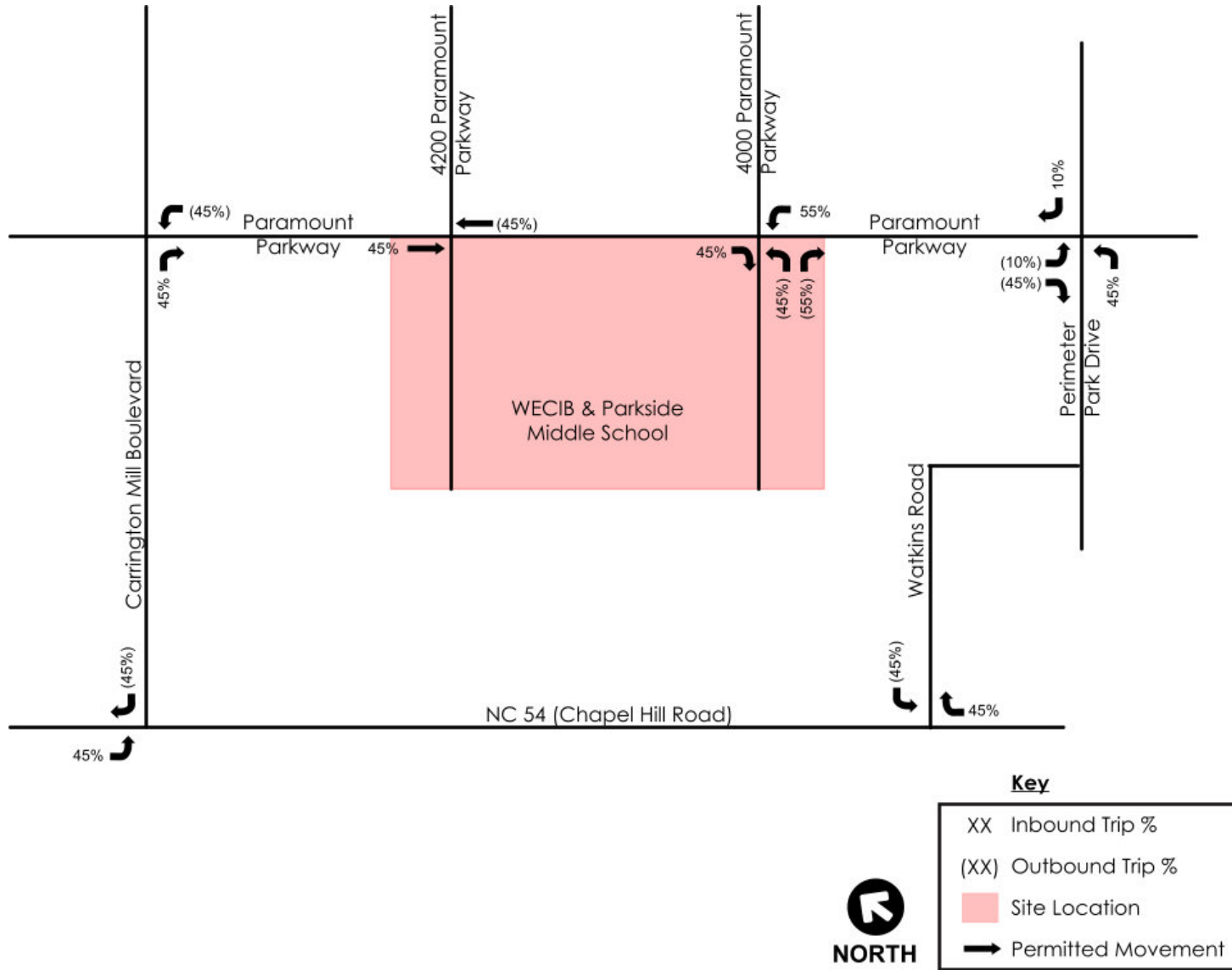


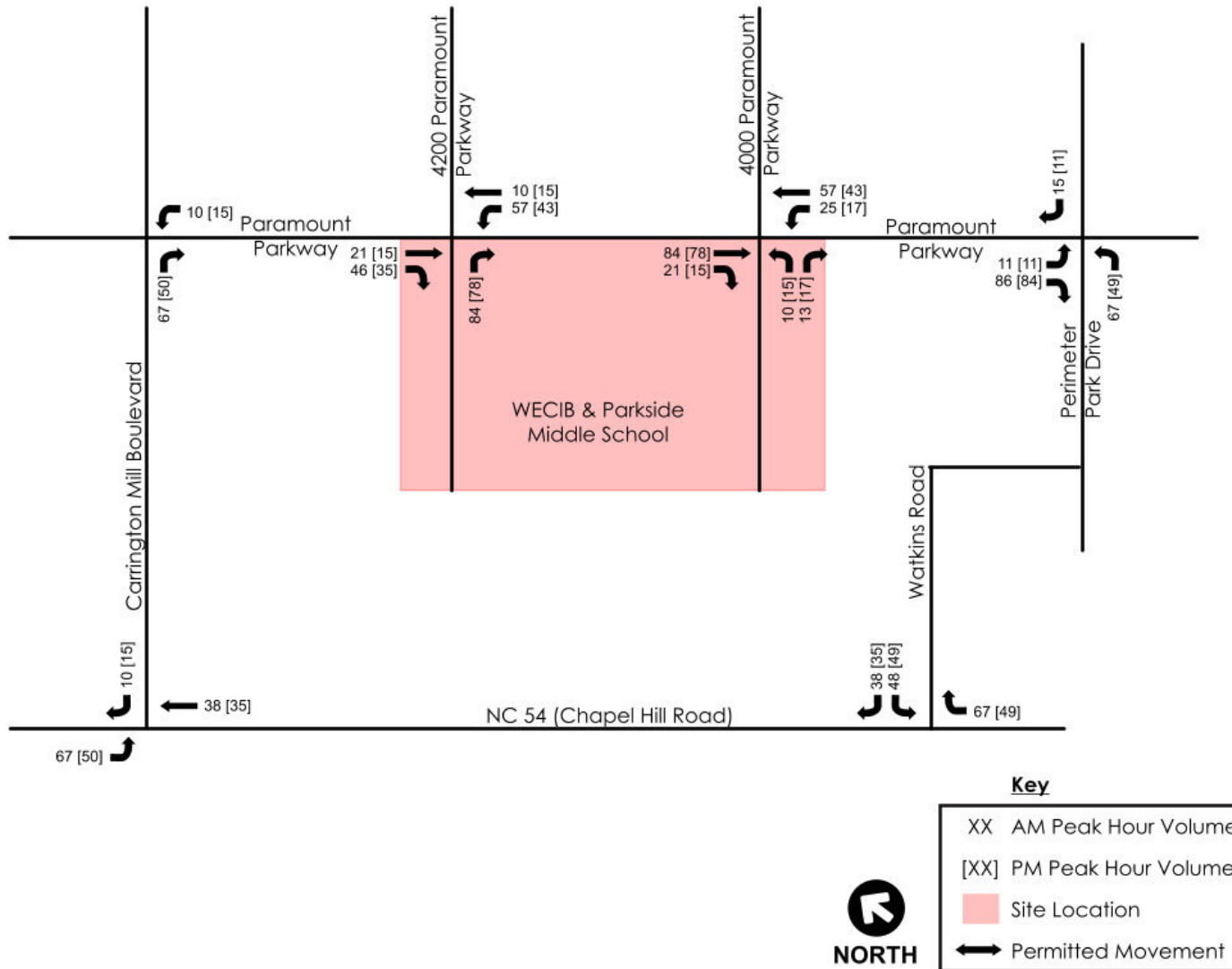
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PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Trip Distribution
 March 13, 2026

Figure 7: WECIB Trip Assignment



5.0 TRAFFIC VOLUMES: WECIB

The traffic counts and all traffic volume calculations can be found in the appendix.

5.1 EXISTING TRAFFIC VOLUMES

5.1.1 Traffic Counts

Morning (6:30 – 9:00 AM) and afternoon (1:30 – 4:00 PM) turning movement counts were collected on April 15, 2025, at the intersections listed below.

- Paramount Parkway at Carrington Mill Boulevard
- Paramount Parkway at 4200 Paramount Parkway
- Paramount Parkway at 4000 Paramount Parkway
- Paramount Parkway at Perimeter Park Drive
- NC 54 (Chapel Hill Road) at Watkins Road
- NC 54 (Chapel Hill Road) at Carrington Mill Boulevard

All counts were performed in five (5) minute intervals. As noted in Section 3.1, the middle school and high school have individual AM and PM peak hours to account for their anticipated bell schedule. The traffic counts were observed for the AM high school peak hour of 6:30 – 7:30 AM and the PM high school peak hour of 2:00 – 3:00 PM.

5.1.2 Volume Balancing

Traffic counts were balanced between the intersections of Paramount Parkway at 4200 Paramount Parkway and 4000 Paramount Parkway. However, volumes were not balanced between other study intersections due to the distances between the intersections and presence of large traffic generators. The balanced traffic counts for WECIB are shown in Figure 9. Traffic volume calculations are provided in the appendix.

5.2 BACKGROUND TRAFFIC GROWTH

Background traffic growth is the increase in traffic volumes due to usage growth and non-specific growth throughout the area. The 2025 existing volumes were grown by a 2.0 percent annual rate to estimate the 2028 volumes. This growth in vehicles is shown for WECIB in Figure 10.

5.3 APPROVED DEVELOPMENT TRAFFIC

Two approved developments were included in this analysis. These are discussed in the following subsections.

5.3.1 Discovery at Watkins Road

The Discovery at Watkins Road is a research and development center located on the south side of Watkins Road. The site is anticipated to consist of 576,000 square feet of research and development space.



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Traffic Volumes

March 13, 2026

Site trips generated by this approved development traveling along study roads/intersections were included in the future analysis scenarios. As both the AM and PM peak hours for WECIB fall outside typical peak hours, calculations were performed to determine the time of day percentages in one hour intervals in combination with the percentage of standard peak hour trips to daily trips to reflect the anticipated site trips in the WECIB AM and PM peak hour shown in Figure 11. These calculations and a copy of the Watkins Road Development TIA are included in the appendix.

5.3.2 Atlas Morrisville fka Watkins Road Mixed Use

The Atlas Morrisville development is located on the north side of Watkins Road and east of the Wake Tech Community College campus. It is anticipated to consist of 360 dwelling units of multifamily housing and 8,000 square feet of office space.

Site trips generated by this approved development traveling along study roads/intersections were included in the future analysis scenarios. As both the AM and PM peak hours for WECIB fall outside typical peak hours, calculations were performed to determine the time of day percentages in one hour intervals in combination with the percentage of standard peak hour trips to daily trips to reflect the anticipated site trips in the WECIB AM and PM peak hour shown in Figure 11. These calculations and a copy of the Watkins Road Mixed-Use TIA are included in the appendix.

5.4 NO-BUILD TRAFFIC VOLUMES

The 2028 No-Build traffic volumes for WECIB consist of the sum of the 2025 Existing traffic volumes (Figure 9), the Background traffic growth (Figure 10), and the approved development traffic (Figure 11). The 2028 No-Build traffic volumes are shown for WECIB in Figure 12.

5.5 BUILD TRAFFIC VOLUMES

The 2028 Build traffic volumes include the 2028 No-Build traffic and the proposed development traffic discussed in Section 3.0 and Section 4.0. The total build traffic volumes are shown for WECIB in Figure 13.

5.5.1 Peak Hour Factors

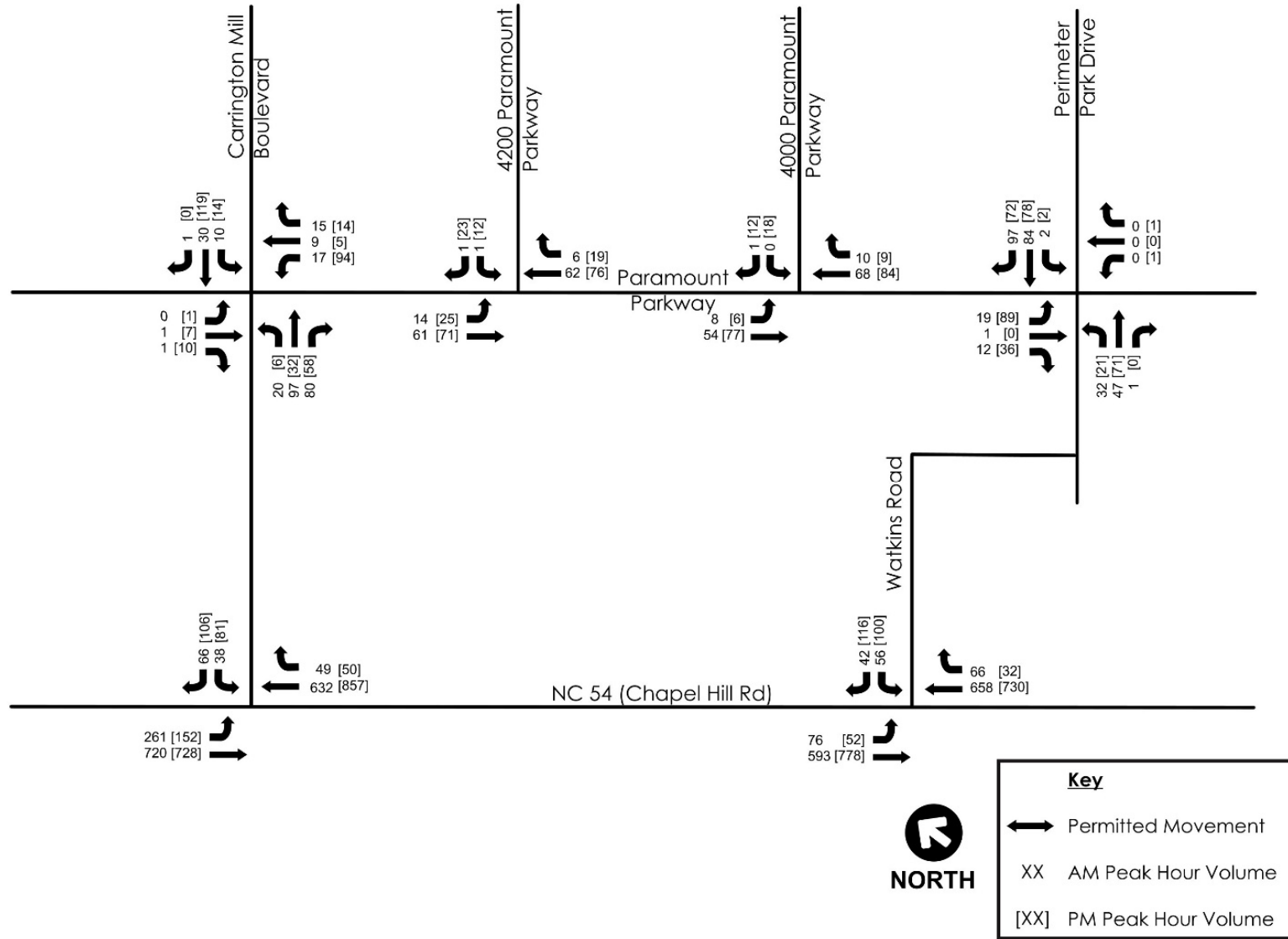
The total 2028 Build traffic volumes include both the school traffic and the traffic volumes from the 2028 No-Build analysis. The No-Build traffic volumes were assumed to operate with a peak hour factor (PHF) of 0.9 whereas traffic to/from the proposed schools is assumed to operate with a PHF of 0.5. Weighted averages were used to determine the individual movement PHFs in the Build and Build-Improved analysis scenarios. Traffic volume calculations, including PHF calculations, are contained in the appendix.



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Traffic Volumes
March 13, 2026

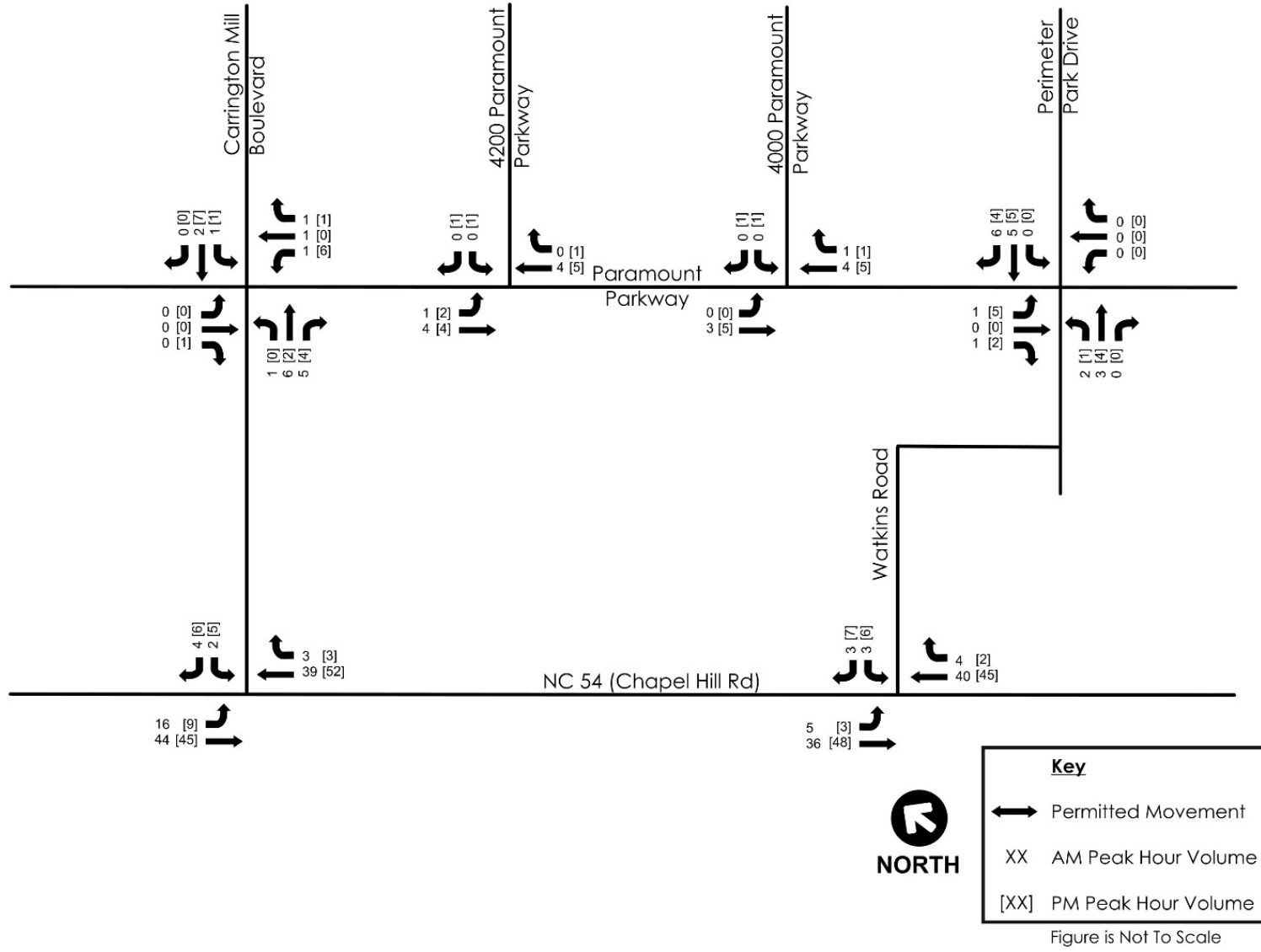
Figure 9: 2025 WECIB Existing Traffic Volumes



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Traffic Volumes
 March 13, 2026

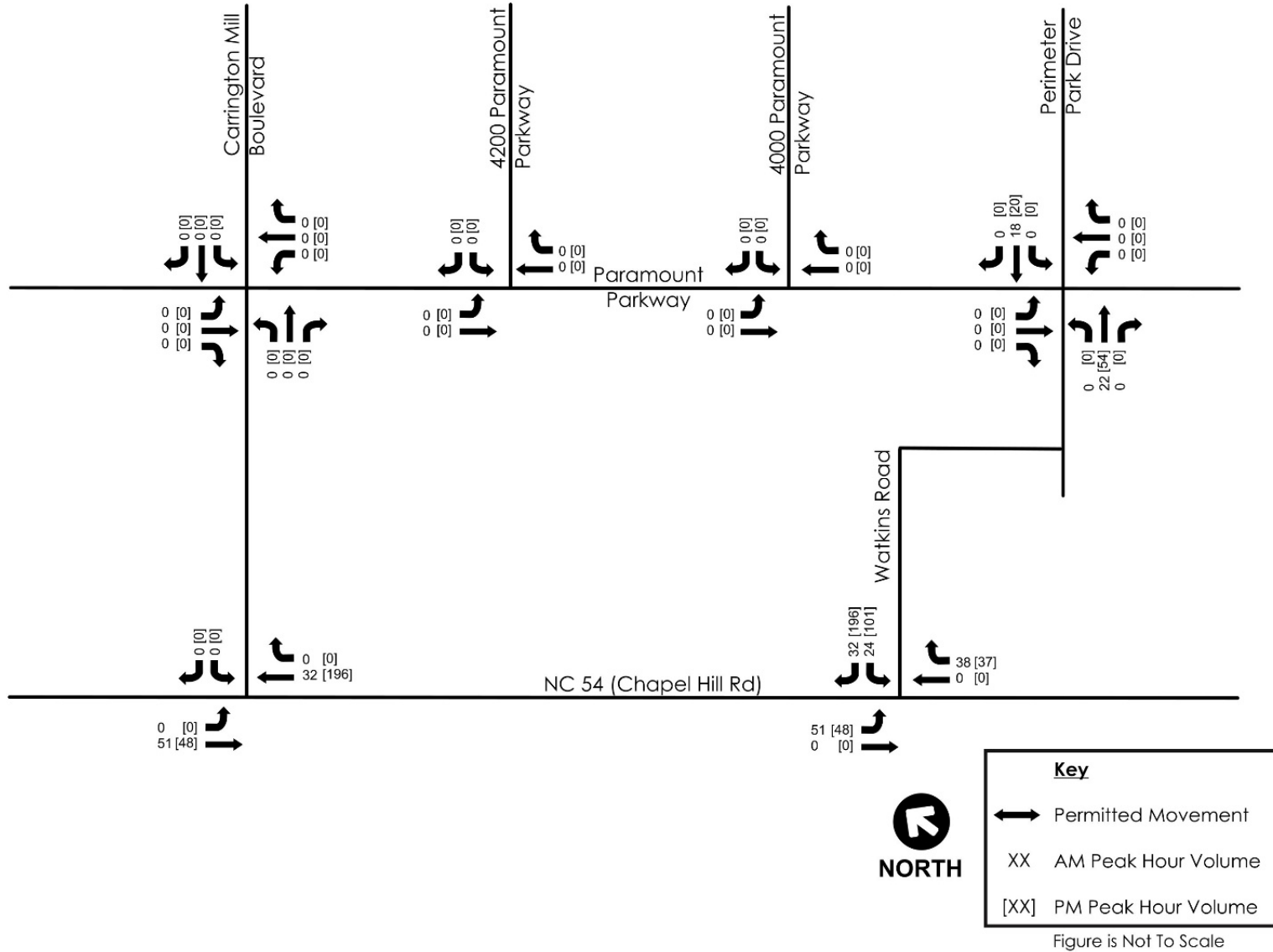
Figure 10: WECIB Background Growth Volumes



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Traffic Volumes
 March 13, 2026

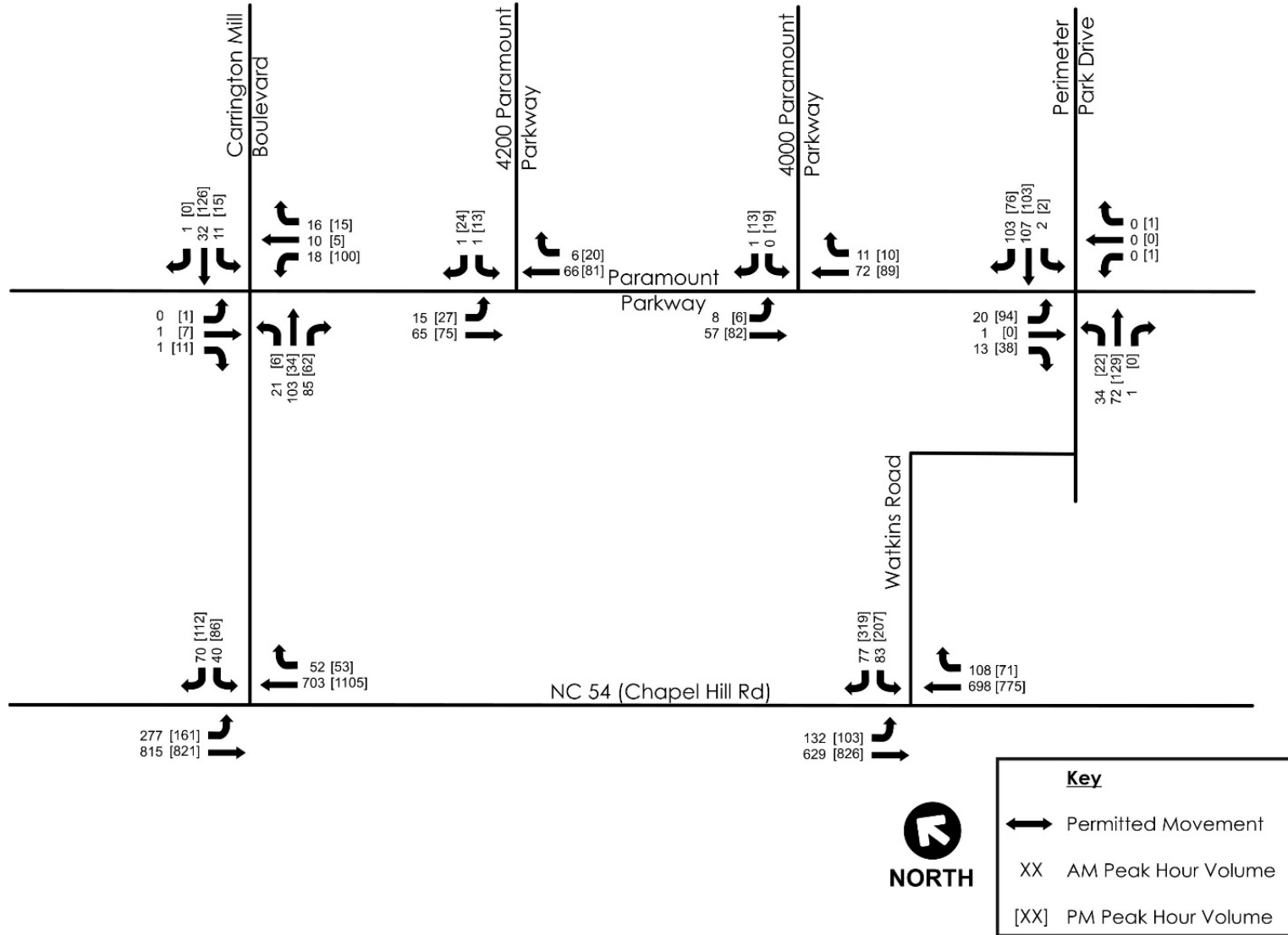
Figure 11: WECIB Approved Development Traffic Volumes



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Traffic Volumes
March 13, 2026

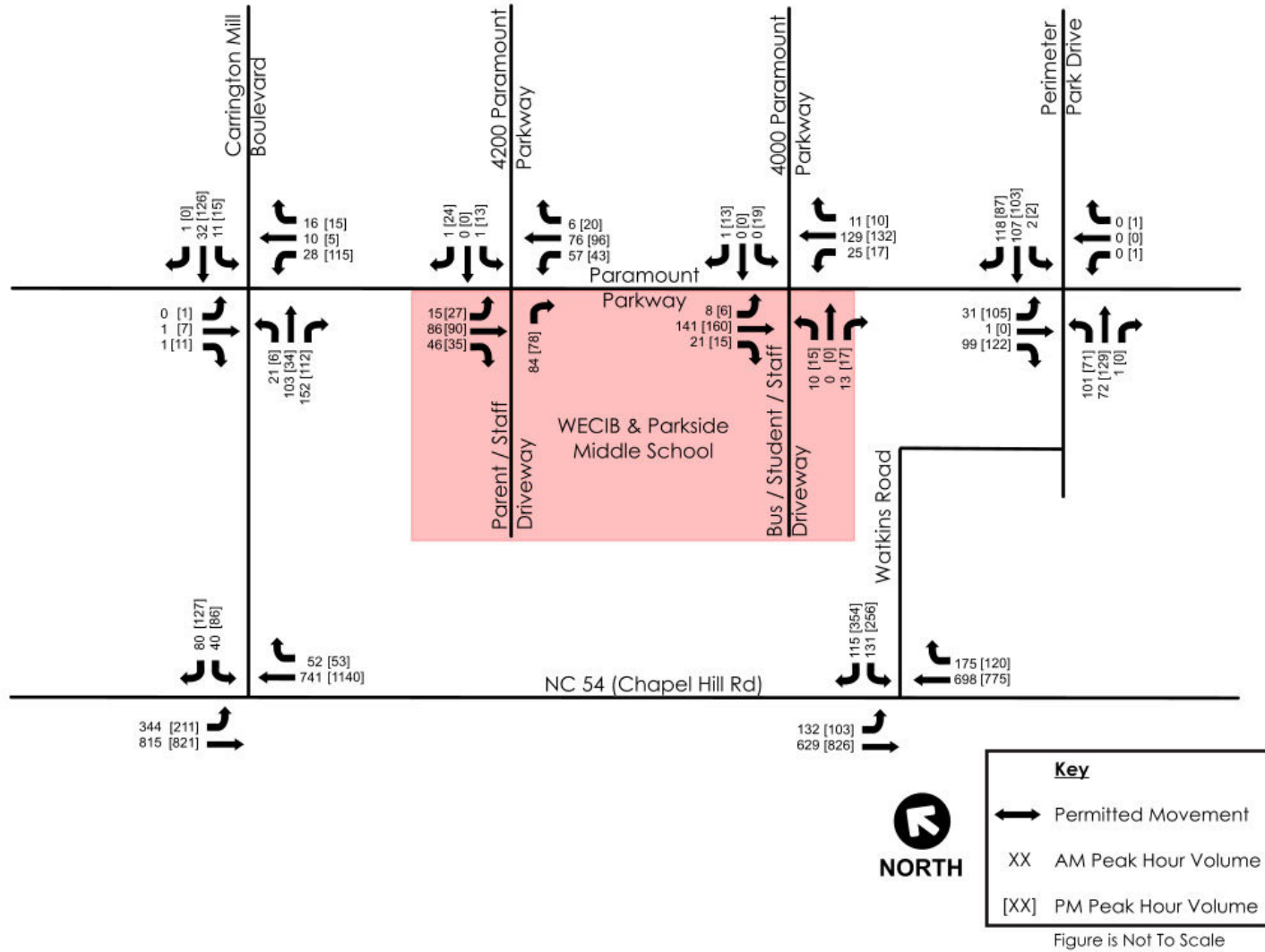
Figure 12: 2028 WECIB No-Build Traffic Volumes



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Traffic Volumes
March 13, 2026

Figure 13: 2028 WECIB Build Traffic Volumes



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Capacity Analysis: WECIB

March 13, 2026

6.0 CAPACITY ANALYSIS: WECIB

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 (HCM)⁵.

The HCM defines capacity as the "maximum rate of flow at which persons or vehicles can be reasonably expected to traverse a point or uniform section of a lane or roadway during a specified period under the 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 the 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. Generally, 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. Schools generate traffic uniquely as the traffic occurs for a short duration in the morning and another in mid-afternoon on weekdays while school is in session. Outside of these short durations, schools generate minimal traffic. As a result of this, higher delays (i.e., LOS D, E, or F) at intersections near schools are typically observed.

Capacity analyses were completed using the NCDOT Congestion Management Capacity Analysis Guidelines⁶, and the requirements for school traffic operations studies outlined in the MSTA School Calculator⁴. Table 4 presents the criteria of each LOS as indicated in the HCM⁵.

Table 4: 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



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Capacity Analysis: WECIB

March 13, 2026

Capacity analyses were performed for the following conditions:

- 2025 Existing;
- 2028 No-Build;
- 2028 Build; and
- 2028 Build with Improvements.

SimTraffic runs were completed for all scenarios to observe the predicted traffic operations throughout the study area during each of the peak hours. As in standard practice, ten (10) SimTraffic analysis runs were performed for each scenario, using MSTA simulation settings. All Synchro files and detailed printouts can be found in the appendix. A summary of the results of the analyses is provided in the following sub-sections.

6.1 2025 EXISTING

In the base year of 2025 under the existing geometric conditions, all study intersections operate at an acceptable LOS. Instances where the lane group operate at LOS E are highlighted in the table and listed below.

- NC 54 at Carrington Mill Boulevard – WBL – AM peak hour; SBL – AM and PM peak hours.
- Paramount Parkway at Carrington Mill Boulevard – WBL, WBLTR – AM peak hour.
- Paramount Parkway at Perimeter Park Drive – WBLTR – AM peak hour; EBL – PM peak hour.
- NC 54 at Watkins Road - WBL – AM and PM peak hours.

Synchro LOS and delay results for the 2025 Existing scenario are listed in Table 5.



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Capacity Analysis: WECIB

March 13, 2026

Table 5: 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
	NC 54 at Carrington Mill Boulevard	Overall		15.2	13.8	B	B				
		WB	L	55.8	54.0	E	D	72	129	74	131
			R	31.1	30.5	C	C	96	158	118	160
		NB	T	5.9	6.8	A	A	74	115	199	207
			R	3.2	2.2	A	A	15	10	58	66
		SB	L	59.8	60.6	E	E	154	100	193	168
			T	4.4	6.2	A	A	239	307	154	202
	Paramount Parkway at Carrington Mill Boulevard	Overall		10.5	27.1	B	C				
		EB	LTR	32.9	36.7	C	D	30	22	39	55
		WB	L	55.8	39.4	E	D	29	88	35	88
			LTR	56.1	39.7	E	D	30	92	73	106
			R	28.5	13.7	C	B	12	6	49	45
		NB	L	5.3	20.5	A	C	17	6	39	16
			T	5.2	22.9	A	C	97	16	87	45
			R	5.1	5.9	A	A	21	22	88	64
		SB	L	21.4	30.6	C	C	36	30	27	33
			TR	25.1	27.5	C	C	38	85	23	55
			Paramount Parkway at 4200 Paramount Parkway	EB	LT	7.4	7.5	A	A	0	3
SB	LR			8.9	9.1	A	A	0	3	21	33
	Paramount Parkway at 4000 Paramount Parkway	EB	LT	7.4	7.4	A	A	0	0	3	3
		SB	L	9.2	9.4	A	A	0	3	19	30
			R	8.5	8.6	A	A	0	0	22	28
	Paramount Parkway at Perimeter Park Drive	Overall		8.7	23.6	A	C				
		EB	L	37.3	63.8	D	E	18	90	56	120
			TR	36.2	40.6	D	D	17	48	41	74
		WB	LTR	56.4	47.7	E	D	29	27	14	12
		NB	L	1.7	3.4	A	A	9	11	21	14
			TR	2.6	4.7	A	A	11	21	23	30
		SB	L	1.8	3.8	A	A	2	3	8	8
TR	3.7		6.2	A	A	32	38	56	57		
	NC 54 at Watkins Road	Overall		8.2	12.8	A	B				
		WB	L	64.2	67.4	E	E	91	139	109	177
			R	42.0	43.6	D	D	64	139	98	182
		NB	TR	6.4	8.8	A	A	155	187	164	195
		SB	L	2.6	3.2	A	A	20	17	84	62
			T	3.5	5.8	A	A	172	252	141	212

Intersection or Lane Group Operates at LOS E



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Capacity Analysis: WECIB

March 13, 2026

6.2 2028 NO-BUILD

In the 2028 No Build conditions, the analysis assumes the improvements associated with NCDOT projects are constructed. These improvements, discussed in Section 2.4, are listed below:

6.2.1 NC 54 Corridor

- Widen and reconfigure NC 54 to provide a third westbound through lane generally from Transformation Road (Wake Technical Community College driveway) through the NC 540 interchange.
- Widen and reconfigure NC 54 to provide at least one additional eastbound through lane from north of the NC 540 interchange to McCrimmon Parkway
- Widen and reconfigure NC 54 to a four-lane median divided roadway generally between Watkins Road and Perimeter Park Drive.
- Modify impacted traffic signals as necessary to accommodate the revised laneage.

6.2.2 NC 54 at Carrington Mill Boulevard

- Widen the southbound approach of Carrington Mill Boulevard to provide dual-left and right-turn lanes.
- Extend the storage of the existing inside eastbound left-turn lane on NC 54 to provide approximately 750 feet of storage.
- Provide a westbound right-turn lane on NC 54 with approximately 430 feet of storage.

6.2.3 NC 54 at Watkins Road

- Widen the southbound approach of Watkins Road to provide dual left-turn lanes and a single right-turn lane.
- Provide a westbound right-turn lane on NC 54 with approximately 140 feet of storage.
- Provide dual eastbound left-turn lanes on NC 54 with approximately 200 feet of storage.

In the future year of 2028 under the future year no build geometric conditions, all study intersections operate at an acceptable LOS. Synchro LOS and delay results for the 2028 No Build analysis scenario are listed in Table 6.

Instances where the lane group operate at LOS E are highlighted in the table and listed below.

- Paramount Parkway at Carrington Mill Boulevard – EBLTR – AM and PM peak hours.
- Paramount Parkway at Perimeter Park Drive – WBLTR – AM peak hour, EBL – PM peak hour.



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Capacity Analysis: WECIB

March 13, 2026

Table 6: 2028 No-Build Level of Service and Delay

Intersection		Approach	Lane Group	Delay (sec./veh.)		Level of Service (LOS)		95th % Queue (feet)		Max. Obs. Queue (feet)	
				AM	PM	AM	PM	AM	PM	AM	PM
	NC 54 at Carrington Mill Boulevard	Overall		12.0	10.3	B	B				
		WB	L	49.3	41.8	D	D	35	69	57	75
			R	29.8	24.4	C	C	48	72	69	76
		NB	T	4.5	6.1	A	A	39	119	112	174
			R	0.9	2.1	A	A	5	13	39	44
		SB	L	52.1	53.3	D	D	156	102	205	153
T	2.1		2.8	A	A	80	95	96	127		
	Paramount Parkway at Carrington Mill Boulevard	Overall		13.1	23.2	B	C				
		EB	LTR	56.5	60.7	E	E	30	47	42	60
		WB	L	33.3	27.3	C	C	16	42	37	98
			LTR	33.3	26.5	C	C	17	43	82	111
			R	28.9	13.9	C	B	6	5	38	49
		NB	L	6.6	14.7	A	B	10	7	30	12
			T	6.7	12.5	A	B	16	13	71	41
			R	1.3	1.2	A	A	8	9	81	70
		SB	L	20.7	35.5	C	D	24	35	31	29
			TR	23.9	27.2	C	C	33	89	37	78
	Paramount Parkway at 4200 Paramount Parkway	EB	LT	7.4	7.5	A	A	0	3	12	30
		SB	LR	8.9	9.1	A	A	0	3	21	42
	Paramount Parkway at 4000 Paramount Parkway	EB	LT	7.4	7.4	A	A	0	0	18	9
		SB	L	9.2	9.2	A	A	0	3	26	30
			R	8.5	8.4	A	A	0	0	16	28
	Paramount Parkway at Perimeter Park Drive	Overall		7.4	21.2	A	C				
		EB	L	31.0	65.8	C	E	18	128	49	150
			TR	30.1	41.5	C	D	15	52	45	78
		WB	LTR	56.2	47.3	E	D	29	26	14	30
		NB	L	1.7	3.6	A	A	9	11	25	20
			TR	2.5	4.7	A	A	15	34	29	49
		SB	L	1.8	3.8	A	A	2	4	9	7
TR	3.7		6.3	A	A	37	45	74	57		
	NC 54 at Watkins Road	Overall		12.8	19.6	B	B				
		WB	L	53.3	53.0	D	D	60	124	121	203
			R	37.7	48.6	D	D	95	318	120	290
		NB	T	8.6	12.9	A	B	170	258	194	285
			R	2.7	3.5	A	A	30	28	71	95
		SB	L	53.2	51.4	D	D	88	65	120	101
			T	2.4	3.7	A	A	64	112	94	151

Intersection or Lane Group Operates at LOS E



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Capacity Analysis: WECIB

March 13, 2026

6.3 2028 BUILD

This analysis scenario evaluates traffic operations with the addition of the WECIB traffic. With the addition of these high school trips, the overall study intersections operate at an acceptable LOS. Synchro LOS and delay results for the 2028 Build analysis scenario are listed in Table 7. Instances where the lane group operate at LOS E are highlighted in the table and listed below.

- NC 54 at Carrington Mill Boulevard – WBL – AM peak hour.
- Paramount Parkway at Carrington Mill Boulevard – EBLTR – AM and PM peak hours.
- Paramount Parkway at Perimeter Park Drive – EBTR – AM and PM peak hours.



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Capacity Analysis: WECIB

March 13, 2026

Table 7: 2028 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
	NC 54 at Carrington Mill Boulevard	Overall		14.9	11.7	B	B				
		WB	L	55.4	38.4	E	D	28	58	53	76
			R	22.8	20.9	C	C	30	74	84	102
		NB	T	8.6	7.1	A	A	104	140	164	234
			R	4.4	2.4	A	A	22	14	51	46
		SB	L	50.6	52.7	D	D	180	121	229	220
			T	2.1	2.8	A	A	80	95	107	128
	Paramount Parkway at Carrington Mill Boulevard	Overall		10.9	20.4	B	C				
		EB	LTR	56.5	60.7	E	E	30	47	44	64
		WB	L	32.8	19.1	C	B	17	46	62	114
			LTR	32.9	19.3	C	B	23	51	85	123
		R	L	27.6	4.7	C	A	6	5	43	41
			T	7.5	23.7	A	C	33	16	30	14
		NB	T	6.1	22.0	A	C	63	35	117	34
			R	1.0	1.3	A	A	10	7	170	111
		SB	L	29.5	41.4	C	D	28	35	30	27
			TR	25.2	34.2	C	C	33	89	34	72
	Paramount Parkway at 4200 Paramount Parkway / MS Entrance	NB	R	9.6	9.2	A	A	15	13	91	94
		EB	LT	7.4	7.5	A	A	0	3	18	30
		WB	LT	7.8	7.7	A	A	8	5	40	38
		SB	LTR	11.3	10.2	B	B	0	5	23	36
	Paramount Parkway at 4000 Paramount Parkway / HS Entrance	NB	LTR	10.3	10.0	B	B	5	8	53	67
		EB	LT	7.6	7.5	A	A	0	0	23	18
		WB	LT	7.8	7.7	A	A	3	3	48	40
		SB	L	11.5	10.8	B	B	0	3	23	32
			R	8.6	8.6	A	A	0	0	18	29
	Paramount Parkway at Perimeter Park Drive	Overall		23.3	28.9	C	C				
		EB	L	34.2	49.8	C	D	38	135	81	173
			TR	61.0	65.0	E	E	201	219	234	246
		WB	LTR	42.9	41.6	D	D	25	24	18	30
		NB	L	5.5	5.7	A	A	42	33	65	49
			TR	6.5	6.8	A	A	25	41	38	52
		SB	L	5.5	6.0	A	A	4	5	9	14
TR	10.4		10.6	B	B	73	62	105	68		
	NC 54 at Watkins Road	Overall		14.8	21.3	B	C				
		WB	L	53.4	52.3	D	D	82	142	189	262
			R	38.6	44.6	D	D	123	310	163	375
		NB	T	9.8	16.4	A	B	184	306	208	318
			R	2.9	4.6	A	A	44	52	106	171
		SB	L	50.7	47.6	D	D	79	63	123	89
			T	2.2	4.5	A	A	22	128	118	217

Intersection or Lane Group Operates at LOS E



6.4 2028 BUILD WITH IMPROVEMENTS

6.4.1 Proposed Improvements

Paramount Parkway at Carrington Mill Boulevard

- Extend the northbound right turn lane on Carrington Mill Boulevard to 250 feet of full-width storage and appropriate taper.

Paramount Parkway at 4200 Paramount Parkway / Proposed Driveway

- Construct the proposed driveway as a restricted-movement access point with two ingress and one egress lane. Access at the driveway is recommended to be limited to left-turns in, right-turns in, and right-turns out. That is, left turns and thru out of the driveway are prohibited.
- Construct an exclusive right-turn lane with 200 feet of full-width storage and appropriate taper.

Paramount Parkway at 4000 Paramount Parkway / Proposed Driveway

- Construct the proposed driveway as a full-movement access point with one ingress and one egress lane.

Paramount Parkway at Perimeter Park Drive

- Extend the northbound left turn lane on Perimeter Park Drive to the maximum amount of full-width storage and appropriate taper without encroaching on the existing southbound left turn lane at the IQVIA Biotech intersection.

NC 54 (Chapel Hill Road) at Watkins Road

- Extend the northbound right turn lane on NC 54 (Chapel Hill Road) to 175 feet of full-width storage and appropriate taper.

6.4.2 Analysis Results

With the recommended improvements in place, the overall study intersections operate at an acceptable LOS. Synchro LOS and delay results for the 2028 Build Improved analysis scenario are listed in Table 8. Instances where the lane group operate at LOS E are highlighted in the table and listed below.

- NC 54 at Carrington Mill Boulevard – WBL – AM peak hour.
- Paramount Parkway at Carrington Mill Boulevard – EBLTR – AM and PM peak hours.
- Paramount Parkway at Perimeter Park Drive – EBTR – AM and PM peak hours.



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Capacity Analysis: WECIB

March 13, 2026

Table 8: 2028 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
	NC 54 at Carrington Mill Boulevard	Overall		14.9	11.7	B	B				
		WB	L	55.4	38.4	E	D	28	58	50	79
			R	22.8	20.9	C	C	30	74	67	97
		NB	T	8.6	7.1	A	A	104	140	155	190
			R	4.4	2.4	A	A	22	14	52	43
		SB	L	50.6	52.7	D	D	180	121	275	199
			T	2.1	2.8	A	A	80	95	130	118
	Paramount Parkway at Carrington Mill Boulevard	Overall		10.9	20.4	B	C				
		EB	LTR	56.5	60.7	E	E	30	47	43	67
		WB	L	32.8	19.1	C	B	17	46	46	107
			LTR	32.9	19.3	C	B	23	51	88	111
			R	27.6	4.7	C	A	6	5	42	42
		NB	L	7.5	23.7	A	C	33	16	28	8
			T	6.1	22.0	A	C	63	35	65	28
			R	1.0	1.3	A	A	10	7	153	104
		SB	L	29.5	41.4	C	D	28	35	26	26
			TR	25.2	34.2	C	C	33	89	30	65
	Paramount Parkway at 4200 Paramount Parkway / MS Entrance	NB	R	9.2	9.0	A	A	15	13	113	116
		EB	LT	7.4	7.5	A	A	0	3	13	18
		WB	LT	7.8	7.7	A	A	8	5	53	40
		SB	LTR	11.3	10.2	B	B	0	5	21	32
	Paramount Parkway at 4000 Paramount Parkway / HS Entrance	NB	LTR	10.3	10.0	B	B	5	5	54	64
		EB	LT	7.6	7.5	A	A	0	0	17	17
		WB	LT	7.8	7.7	A	A	3	3	43	48
		SB	L	11.5	10.8	B	B	0	3	19	30
			R	8.6	8.6	A	A	0	0	17	28
	Paramount Parkway at Perimeter Park Drive	Overall		23.3	28.9	C	C				
		EB	L	34.2	49.8	C	D	38	135	75	165
			TR	61.0	65.0	E	E	201	219	238	250
		WB	LTR	42.9	41.6	D	D	25	24	18	12
		NB	L	5.5	5.7	A	A	42	33	79	65
			TR	6.5	6.8	A	A	25	41	37	59
		SB	L	5.5	6.0	A	A	4	5	7	16
TR	10.4		10.6	B	B	73	62	113	86		
	NC 54 at Watkins Road	Overall		14.8	21.3	B	C				
		WB	L	53.4	52.3	D	D	82	142	180	249
			R	38.6	44.6	D	D	123	290	167	379
		NB	T	9.8	16.4	A	B	184	178	215	283
			R	2.9	4.6	A	A	44	25	112	100
		SB	L	50.7	47.6	D	D	79	42	120	105
			T	2.2	4.5	A	A	22	88	116	202

Intersection or Lane Group Operates at LOS E



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Traffic Volumes: Parkside Middle School

March 13, 2026

7.0 TRAFFIC VOLUMES: PARKSIDE MIDDLE SCHOOL

The traffic counts and all traffic volume calculations can be found in the appendix.

7.1 EXISTING TRAFFIC VOLUMES

7.1.1 Traffic Counts

Morning (6:30 – 9:00 AM) and afternoon (1:30 – 4:00 PM) turning movement counts were collected on April 15, 2025, at the intersections listed below.

- Paramount Parkway at Carrington Mill Boulevard
- Paramount Parkway at 4200 Paramount Parkway
- Paramount Parkway at 4000 Paramount Parkway
- Paramount Parkway at Perimeter Park Drive
- NC 54 (Chapel Hill Road) at Watkins Road
- NC 54 (Chapel Hill Road) at Carrington Mill Boulevard

All counts were performed in five (5) minute intervals. As noted in Section 3.1, the middle school and high school have individual AM and PM peak hours to account for their anticipated bell schedule. The traffic counts were observed for the AM middle school peak hour of 7:30 – 8:30 AM and the PM high school peak hour of 2:30 – 3:30 PM.

7.1.2 Volume Balancing

Traffic counts were balanced between the intersections of Paramount Parkway at 4200 Paramount Parkway and 4000 Paramount Parkway. However, volumes were not balanced between other study intersections due to the distances between the intersections and presence of large traffic generators. The balanced traffic counts for Parkside Middle School are shown in Figure 14. Traffic volume calculations are provided in the appendix.

7.2 BACKGROUND TRAFFIC GROWTH

The 2025 existing volumes were grown by a 2.0 percent annual rate to estimate the 2028 volumes. This growth in vehicles is shown for Parkside Middle School in Figure 15 .

7.3 APPROVED DEVELOPMENT TRAFFIC

Two approved developments were included in this analysis. These are discussed in the following subsections.

7.3.1 Discovery at Watkins Road

The Discovery at Watkins Road; a research and development center located on the south side of Watkins Road. The site is anticipated to consist of 576,000 square feet of research and development space.



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Traffic Volumes: Parkside Middle School

March 13, 2026

Site trips generated by this approved development traveling along study roads/intersections were included in the future analysis scenarios. For Parkside Middle School, only the PM peak hour falls outside of typical peak hours. Calculations were performed to determine the time-of-day percentages in one-hour intervals in combination with the percentage of standard peak hour trips to daily trips to reflect the anticipated site trips in the Parkside Middle School PM peak hour. The AM and PM site trips generated by this approved development are shown for Parkside Middle School in Figure 16. These calculations and a copy of the Watkins Road Development TIA are included in the appendix.

7.3.2 Atlas Morrisville fka Watkins Road Mixed Use

The Atlas Morrisville development is located on the north side of Watkins Road and east of the Wake Tech Community College campus. It is anticipated to consist of 360 dwelling units of multifamily housing and 8,000 square feet of office space.

Site trips generated by this approved development traveling along study roads/intersections were included in the future analysis scenarios. For Parkside Middle School, only the PM peak hour falls outside of typical peak hours. Calculations were performed to determine the time-of-day percentages in one-hour intervals in combination with the percentage of standard peak hour trips to daily trips to reflect the anticipated site trips in the Parkside Middle School PM peak hour. The AM and PM site trips generated by this approved development are shown in Figure 16. These calculations and a copy of the Watkins Road Mixed-Use TIA are included in the appendix.

7.4 NO-BUILD TRAFFIC VOLUMES

The 2028 No-Build traffic volumes for Parkside Middle School consist of the sum of the 2025 Existing traffic volumes (Figure 14) the Background traffic growth (Figure 15), and the approved development traffic (Figure 16). The 2028 No-Build traffic volumes are shown for Parkside Middle School in Figure 17.

7.5 BUILD TRAFFIC VOLUMES

The 2028 Build traffic volumes include the 2028 No-Build traffic and the proposed development traffic discussed in Section 3.0 and Section 4.0. The 2028 Build traffic volumes are shown for Parkside Middle School in Figure 18.

7.5.1 Peak Hour Factors

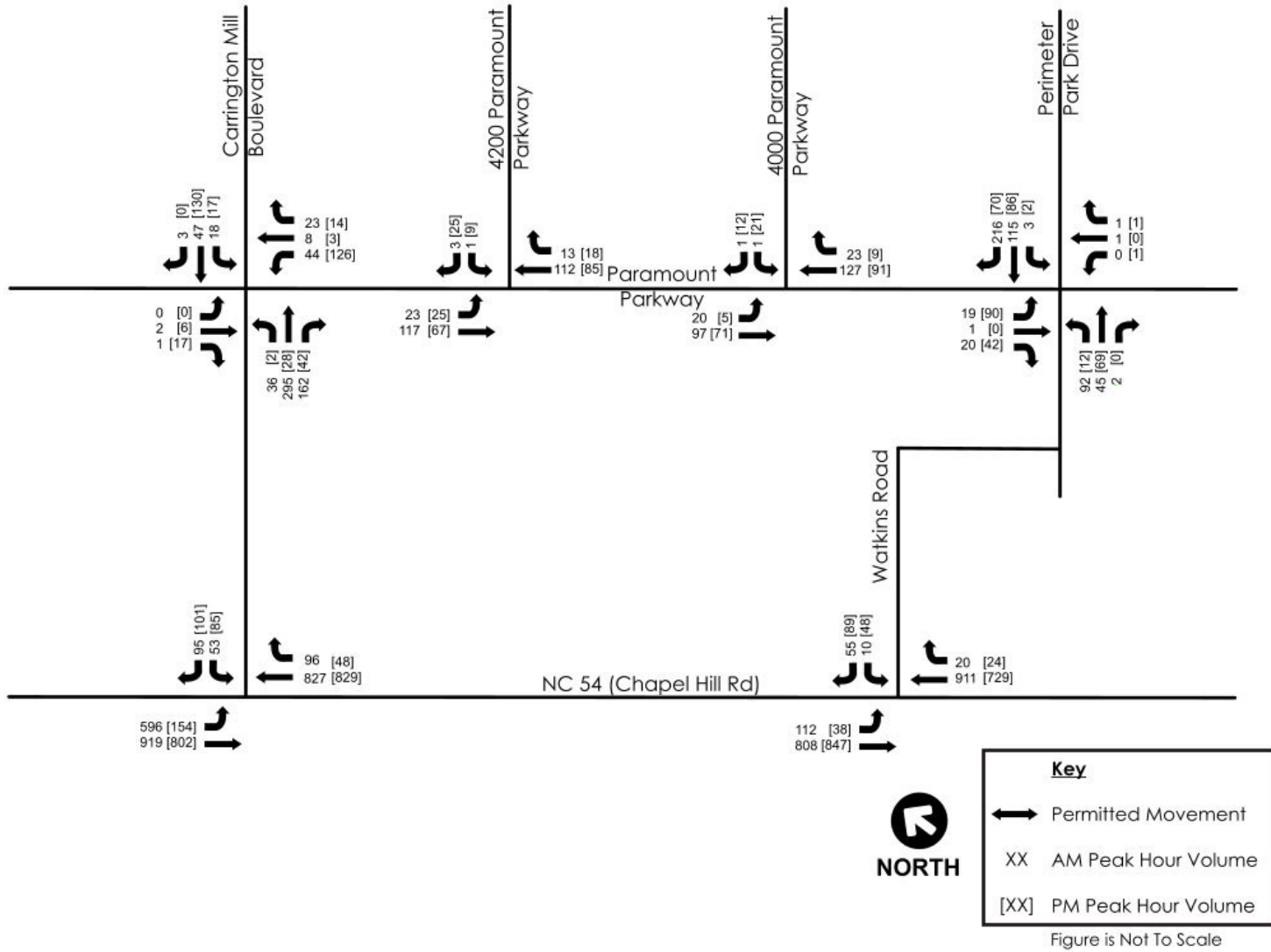
The total 2028 Build traffic volumes include both the school traffic and the traffic volumes from the 2028 No-Build analysis. The No-Build traffic volumes were assumed to operate with a peak hour factor (PHF) of 0.9 whereas traffic to/from the proposed schools is assumed to operate with a PHF of 0.5. Weighted averages were used to determine the individual movement PHFs in the Build and Build-Improved analysis scenarios. Traffic volume calculations, including PHF calculations, are contained in the appendix.



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Traffic Volumes: Parkside Middle School
 March 13, 2026

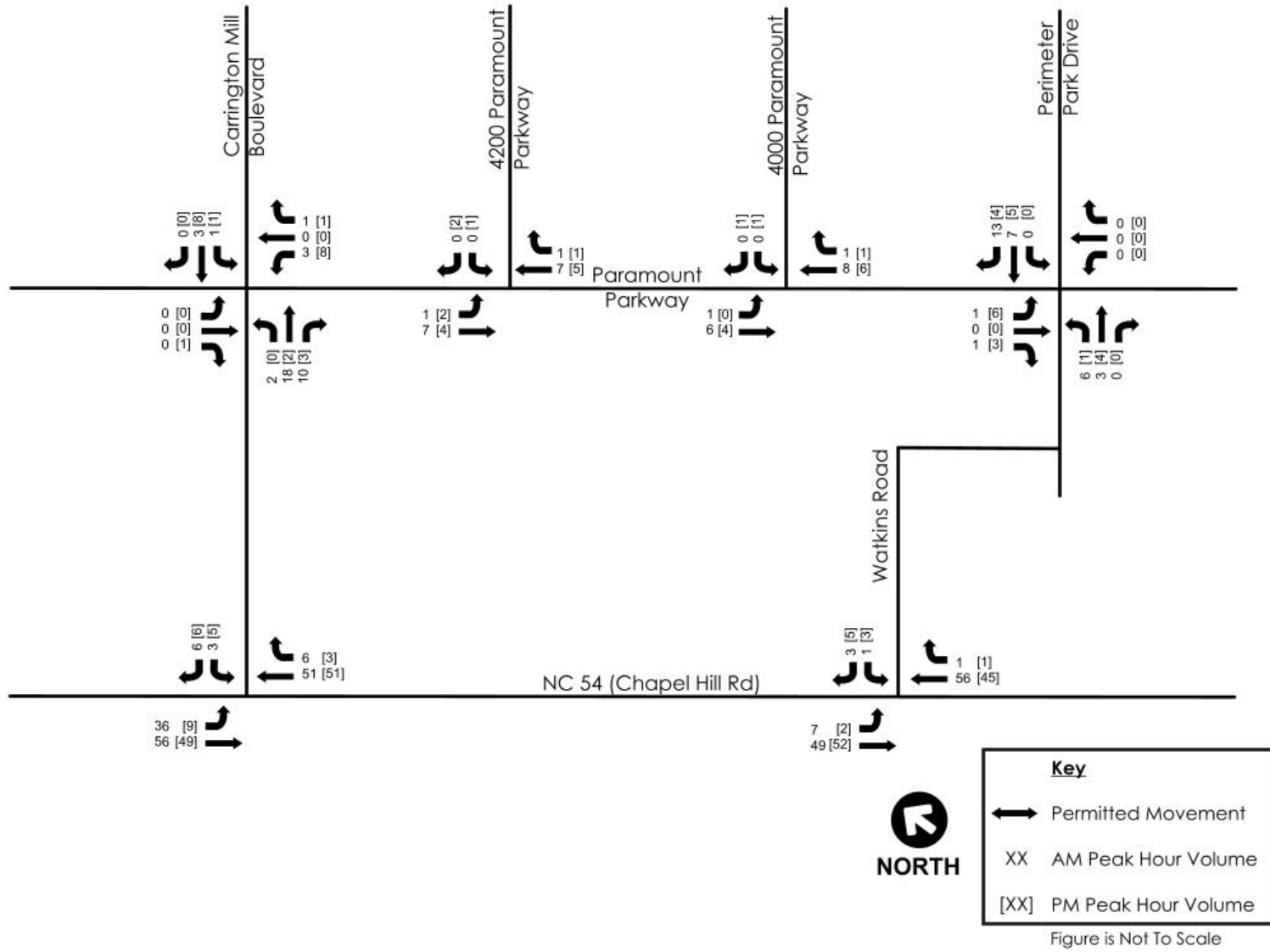
Figure 14: 2025 Parkside MS Existing Traffic Volumes



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Traffic Volumes: Parkside Middle School
 March 13, 2026

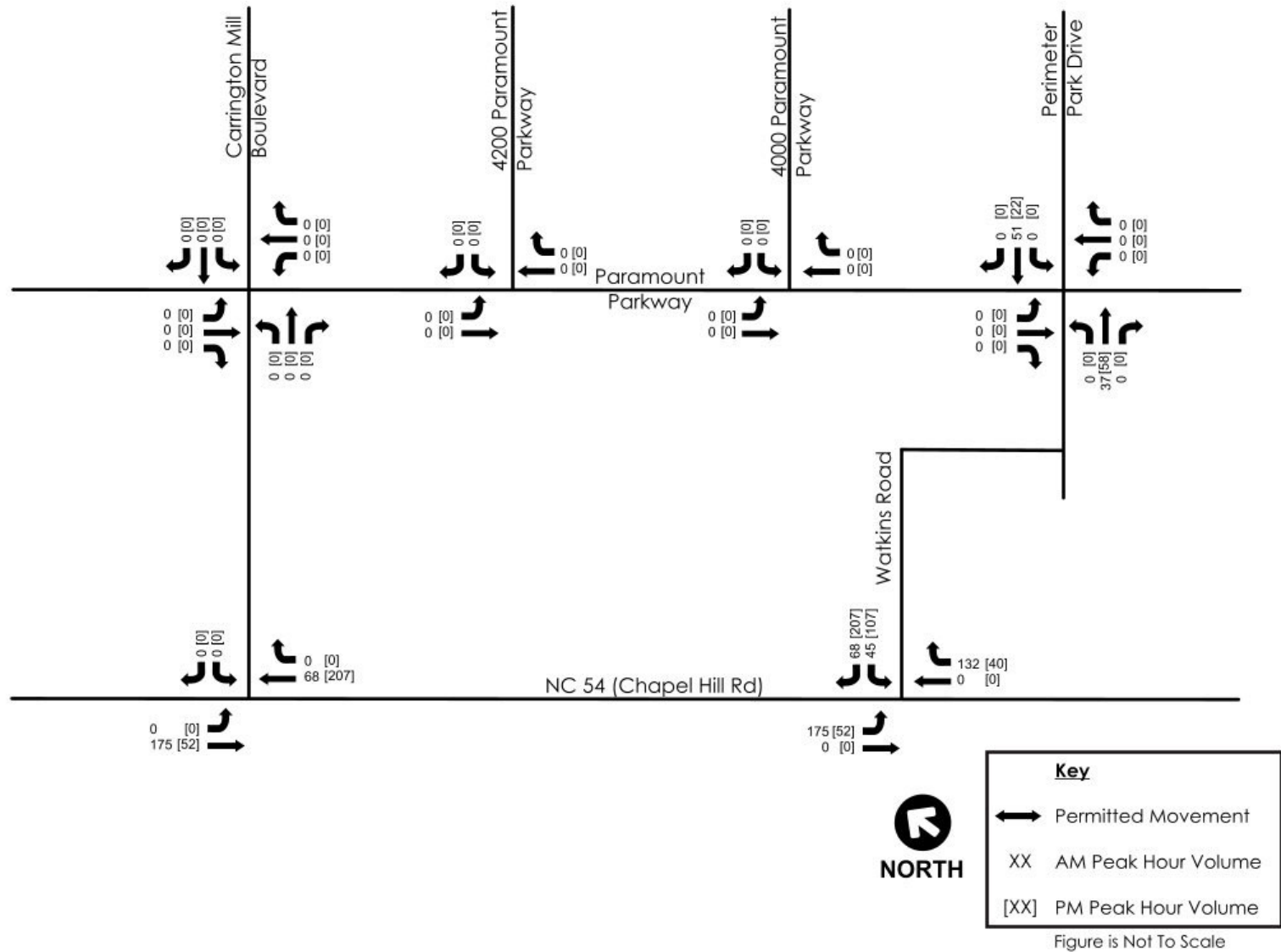
Figure 15: Parkside MS Background Growth Volumes



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Traffic Volumes: Parkside Middle School
 March 13, 2026

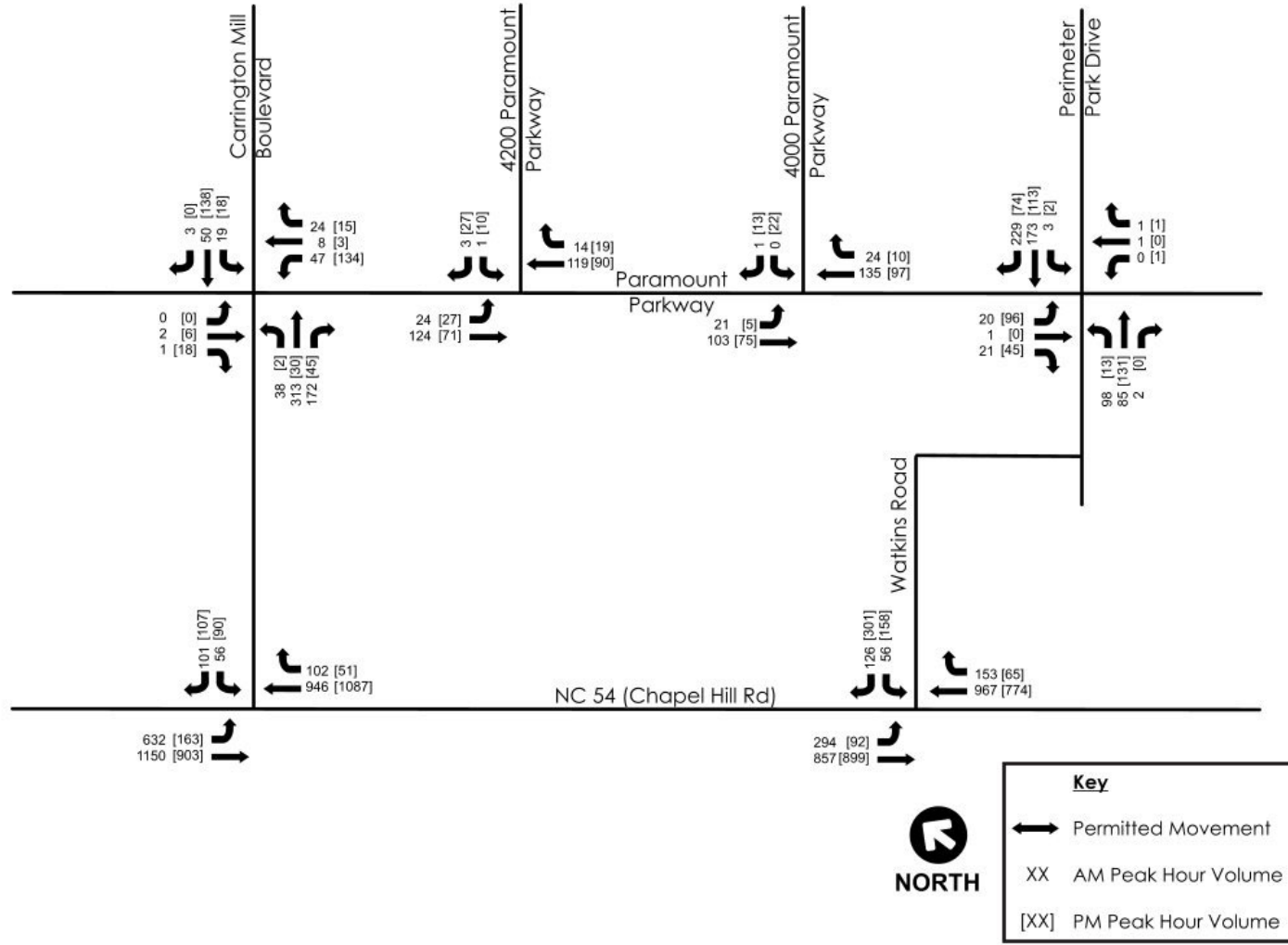
Figure 16: Parkside MS Approved Development Traffic Volumes



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Traffic Volumes: Parkside Middle School
 March 13, 2026

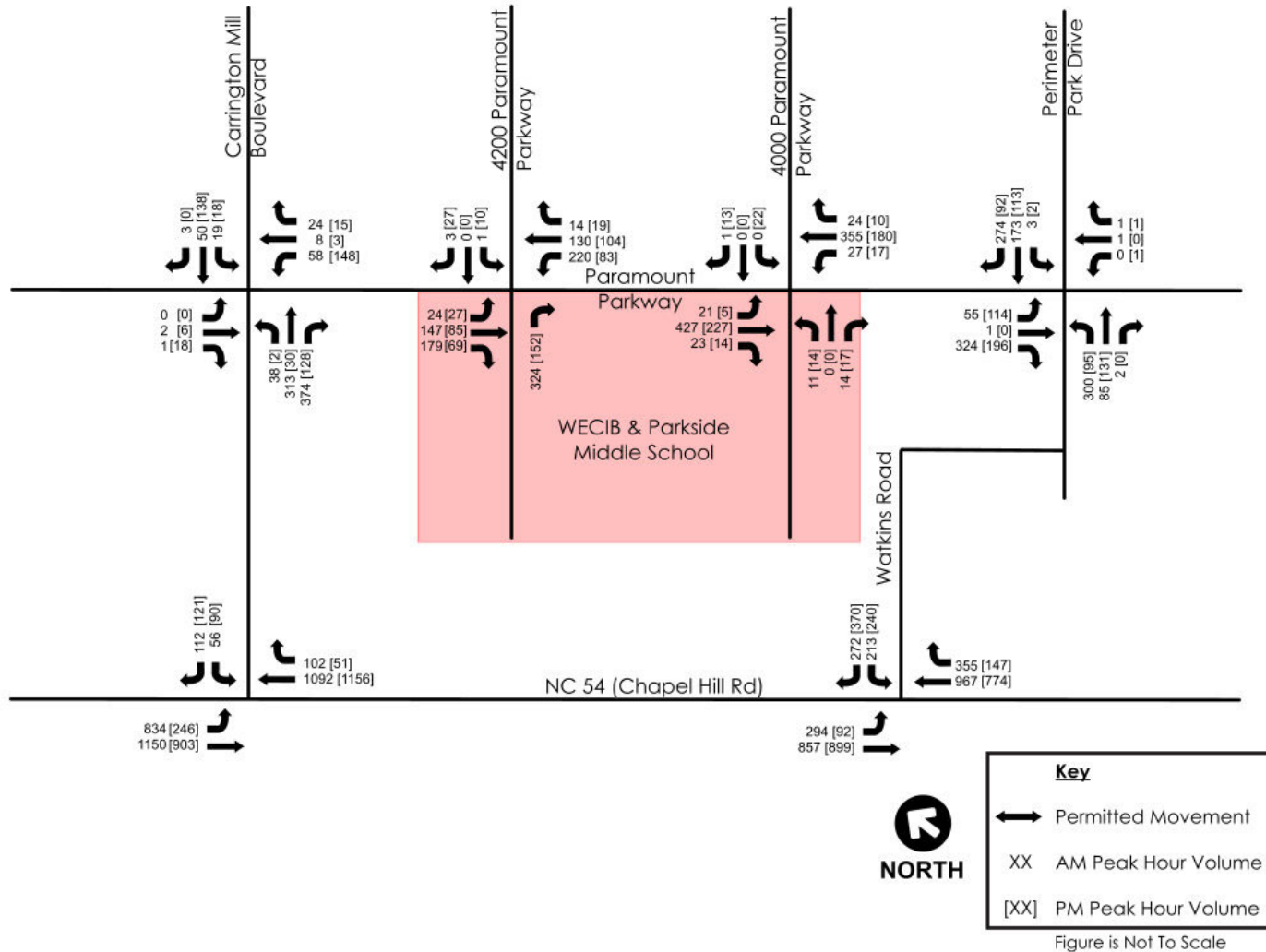
Figure 17: 2028 Parkside MS No-Build Traffic Volumes



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Traffic Volumes: Parkside Middle School
 March 13, 2026

Figure 18: Build Parkside MS Traffic Volumes



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Capacity Analysis: Parkside Middle School

March 13, 2026

8.0 CAPACITY ANALYSIS: PARKSIDE MIDDLE SCHOOL

As discussed in section 6.0, capacity analyses were performed for the roadway network in the study area with respect to the traffic generated by the site during the peak hours associated with Parkside Middle School. Capacity analyses were performed for the following conditions:

- 2025 Existing;
- 2028 No-Build;
- 2028 Build;
- 2028 Build with Improvements

SimTraffic runs were completed for all scenarios to observe the predicted traffic operations throughout the study area during each of the peak hours. As in standard practice, ten (10) SimTraffic analysis runs were performed for each scenario, using MSTA simulation settings. Detailed SimTraffic reports can be found in the appendix.

All Synchro files and detailed printouts can be found in the appendix. A summary of the results of the analyses is provided in the following sub-sections.

8.1 2025 EXISTING

In the base year of 2025 under the existing geometric conditions, all study intersections operate at an acceptable LOS. Instances where the lane group operate at LOS E are highlighted in the table and listed below.

- NC 54 at Carrington Mill Boulevard – SBL – PM peak hour, WBL - AM and PM peak hours
- Paramount Parkway at Carrington Mill Boulevard – EBLTR – AM peak hour.
- Paramount Parkway at Perimeter Park Drive – WBLTR – AM peak hour, EBL –PM peak hour.
- NC 54 at Watkins Road – WBL – AM and PM peak hours.

Synchro LOS and delay results for the 2025 Existing scenario are listed in Table 9.









PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Capacity Analysis: Parkside Middle School

March 13, 2026

Table 9: 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
	NC 54 at Carrington Mill Boulevard	Overall		21.7	14.3	C	B				
		WB	L	65.9	58.5	E	E	83	75	107	149
			R	26.7	27.4	C	C	90	78	124	151
		NB	T	12.8	7.2	B	A	196	130	302	211
			R	3.8	1.8	A	A	13	9	150	48
		SB	L	54.0	60.9	D	E	302	101	357	167
T	7.4		7.2	A	A	413	375	220	202		
	Paramount Parkway at Carrington Mill Boulevard	Overall		10.5	32.1	B	C				
		EB	LTR	56.5	25.8	E	C	30	27	39	61
		WB	L	36.3	43.3	D	D	29	108	64	104
			LTR	36.5	43.3	D	D	30	113	82	115
			R	31.1	4.8	C	A	12	6	51	53
		NB	L	6.6	13.8	A	B	17	2	51	16
			T	5.5	21.1	A	C	97	11	138	43
			R	1.3	11.3	A	B	21	48	166	34
		SB	L	23.8	35.8	C	D	36	33	37	33
TR	20.7		33.9	C	C	38	91	48	78		
	Paramount Parkway at 4200 Paramount Parkway	EB	LT	7.5	7.5	A	A	3	3	30	23
		SB	LR	9.0	9.0	A	A	0	3	17	36
	Paramount Parkway at 4000 Paramount Parkway	EB	LT	7.5	7.4	A	A	0	0	29	12
		SB	L	9.5	9.2	A	A	0	3	19	30
			R	8.5	8.4	A	A	0	0	27	28
	Paramount Parkway at Perimeter Park Drive	Overall		7.3	24.6	A	C				
		EB	L	34.2	65.5	C	E	30	103	69	118
			TR	36.8	43.2	D	D	35	54	84	88
		WB	LTR	56.4	47.6	E	D	29	27	14	15
		NB	L	1.8	3.3	A	A	20	7	41	17
			TR	2.7	4.7	A	A	11	21	20	30
SB	L	1.8	3.5	A	A	2	3	9	8		
	TR	4.3	5.5	A	A	58	40	100	54		
	NC 54 at Watkins Road	Overall		7.5	9.0	A	A				
		WB	L	64.1	63.0	E	E	89	81	111	97
			R	39.0	48.0	D	D	23	118	41	152
		NB	TR	7.5	6.6	A	A	216	158	207	158
		SB	L	3.2	2.2	A	A	25	8	110	52
T	3.9		4.3	A	A	182	211	152	172		

 Intersection or Lane Group Operates at LOS E



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Capacity Analysis: Parkside Middle School

March 13, 2026

8.2 2028 NO-BUILD

In the 2028 No Build conditions, the analysis assumes the improvements associated with NCDOT projects are constructed. These improvements, discussed in Section 2.4, are listed below:

8.2.1 NC 54 Corridor

- Widen and reconfigure NC 54 to provide a third westbound through lane generally from Transformation Road (Wake Technical Community College driveway) through the NC 540 interchange.
- Widen and reconfigure NC 54 to provide at least one additional eastbound through lane from north of the NC 540 interchange to McCrimmon Parkway
- Widen and reconfigure NC 54 to a four-lane median divided roadway generally between Watkins Road and Perimeter Park Drive.
- Modify impacted traffic signals as necessary to accommodate the revised laneage.

8.2.2 NC 54 at Carrington Mill Boulevard

- Widen the southbound approach of Carrington Mill Boulevard to provide dual-left and right-turn lanes.
- Extend the storage of the existing inside eastbound left-turn lane on NC 54 to provide approximately 750 feet of storage.
- Provide a westbound right-turn lane on NC 54 with approximately 430 feet of storage.

8.2.3 NC 54 at Watkins Road

- Widen the southbound approach of Watkins Road to provide dual left-turn lanes and a single right-turn lane.
- Provide a westbound right-turn lane on NC 54 with approximately 140 feet of storage.
- Provide dual eastbound left-turn lanes on NC 54 with approximately 200 feet of storage.

In the future year of 2028 under the future year no build geometric conditions, all study intersections operate at an acceptable LOS. Synchro LOS and delay results for the 2028 No Build analysis scenario are listed in Table 10.

Instances where the lane group operate at LOS E are highlighted in the table and listed below.

- NC 54 at Carrington Mill Boulevard – WBL – AM peak hour.
- Paramount Parkway at Carrington Mill Boulevard – EBLTR – AM and PM peak hour.
- Paramount Parkway at Perimeter Park Drive – WBLTR – AM peak hour, EBL – PM peak hour.



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Capacity Analysis: Parkside Middle School

March 13, 2026

Table 10: 2028 No-Build Level of Service and Delay

Intersection		Approach	Lane Group	Delay (sec./veh.)		Level of Service (LOS)		95th % Queue (feet)		Max. Obs. Queue (feet)	
				AM	PM	AM	PM	AM	PM	AM	PM
	NC 54 at Carrington Mill Boulevard	Overall		16.0	10.0	B	B				
		WB	L	56.4	38.1	E	D	48	56	50	82
			R	17.9	22.3	B	C	45	64	64	78
		NB	T	11.2	6.3	B	A	107	119	242	161
			R	4.2	2.1	A	A	19	13	94	39
		SB	L	44.7	53.3	D	D	297	102	346	160
			T	3.1	3.0	A	A	136	108	279	98
	Paramount Parkway at Carrington Mill Boulevard	Overall		11.3	26.4	B	C				
		EB	LTR	56.5	62.8	E	E	30	56	41	68
		WB	L	40.4	19.9	D	B	41	52	55	117
			LTR	40.5	18.9	D	B	42	54	84	138
			R	32.7	4.7	C	A	16	6	49	27
		NB	L	6.3	23.2	A	C	14	12	66	8
			T	6.9	33.3	A	C	98	33	163	36
			R	1.7	1.0	A	A	39	6	130	41
		SB	L	16.3	35.4	B	D	32	34	33	27
			TR	19.9	33.7	B	C	40	95	46	78
	Paramount Parkway at 4200 Paramount Parkway	EB	LT	7.5	7.4	A	A	3	3	27	26
		SB	LR	9.1	8.8	A	A	0	3	21	36
	Paramount Parkway at 4000 Paramount Parkway	EB	LT	7.5	7.4	A	A	0	0	30	6
		SB	L	9.7	9.3	A	A	0	3	24	30
			R	8.5	8.4	A	A	0	0	27	28
	Paramount Parkway at Perimeter Park Drive	Overall		6.9	22.5	A	C				
		EB	L	35.6	68.8	D	E	41	129	59	164
			TR	38.3	45.3	D	D	49	69	58	103
		WB	LTR	56.2	47.0	E	D	29	26	25	15
		NB	L	1.9	3.8	A	A	21	8	38	15
			TR	2.5	4.7	A	A	17	35	24	45
		SB	L	1.8	3.8	A	A	2	4	7	6
TR	4.5		5.7	A	A	72	47	126	74		
	NC 54 at Watkins Road	Overall		15.6	17.7	B	B				
		WB	L	53.1	53.3	D	D	45	100	104	183
			R	35.4	49.1	D	D	134	310	152	324
		NB	T	12.7	12.0	B	B	298	242	270	272
			R	4.5	3.5	A	A	57	25	181	65
		SB	L	53.3	50.9	D	D	173	62	206	105
			T	2.4	3.3	A	A	85	112	123	174

Intersection or Lane Group Operates at LOS E



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Capacity Analysis: Parkside Middle School

March 13, 2026

8.3 2028 BUILD

This analysis scenario evaluates traffic operations with the addition of the Parkside Middle School trips. With the addition of the Middle School trips, study intersections and approaches operate with longer delays. At the intersection of Paramount Parkway at 4200 Paramount Parkway / MS Entrance, the southbound movement operates at LOS F in the AM peak hour, experiencing a significant delay. Synchro LOS and delay results for the Build analysis scenario are listed in Table 11. Instances where the overall intersection or lane group operate at LOS E or F are highlighted in the table and listed below.

- Paramount Parkway at Carrington Mill Boulevard – EBLTR – AM and PM peak hour.
- Paramount Parkway at 4200 Paramount Parkway / MS Entrance – SBLTR – AM peak hour.
- Paramount Parkway at Perimeter Park Dr – NBL – AM peak hour; EBTR – AM and PM peak hour.
- NC 54 at Watkins Road – SBL – AM peak hour.



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Capacity Analysis: Parkside Middle School

March 13, 2026

Table 11: 2028 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
	NC 54 at Carrington Mill Boulevard	Overall		19.8	12.7	B	B				
		WB	L	46.2	40.0	D	D	35	60	57	85
			R	11.1	20.6	B	C	28	70	64	89
		NB	T	21.6	8.1	C	A	161	154	299	272
			R	10.7	2.6	B	A	45	12	119	59
		SB	L	38.7	52.1	D	D	349	135	580	244
			T	3.0	3.0	A	A	115	108	498	116
	Paramount Parkway at Carrington Mill Boulevard	Overall		10.9	20.3	B	C				
		EB	LTR	56.5	63.0	E	E	30	56	42	65
		WB	L	26.7	20.7	C	C	25	50	64	124
			LTR	26.8	20.8	C	C	28	54	83	150
		NB	R	13.4	4.8	B	A	13	6	80	40
			L	10.5	22.8	B	C	29	9	35	6
		SB	T	12.9	21.2	B	C	166	31	315	23
			R	2.4	1.6	A	A	28	6	200	112
		SB	L	28.7	40.7	C	D	32	39	43	26
			TR	40.2	33.9	D	C	45	95	30	52
	Paramount Parkway at 4200 Paramount Parkway / MS Entrance	NB	R	28.0	10.8	D	B	235	38	161	143
		EB	LT	7.5	7.5	A	A	3	3	45	30
		WB	LT	10.8	8.1	B	A	53	10	209	71
		SB	LTR	175.3	12.0	F	B	25	5	23	40
	Paramount Parkway at 4000 Paramount Parkway / HS Entrance	NB	LTR	15.9	10.7	C	B	10	8	64	62
		EB	LT	8.3	7.6	A	A	3	0	38	12
		WB	LT	9.0	8.0	A	A	5	3	108	56
		SB	L	19.0	11.7	C	B	3	3	24	35
			R	8.8	8.6	A	A	0	0	24	28
	Paramount Parkway at Perimeter Park Drive	Overall		51.6	30.5	D	C				
		EB	L	19.6	34.6	B	C	45	104	89	176
			TR	58.4	56.4	E	E	694	325	436	376
		WB	LTR	27.9	33.5	C	C	18	20	14	21
		NB	L	57.8	10.7	E	B	220	58	199	87
			TR	19.1	11.5	B	B	44	54	344	86
		SB	L	18.3	11.0	B	B	8	7	11	33
TR	50.1		18.2	D	B	258	93	400	115		
	NC 54 at Watkins Road	Overall		22.4	21.0	C	C				
		WB	L	50.2	51.9	D	D	109	131	250	254
			R	38.1	42.8	D	D	218	312	340	357
		NB	T	19.8	18.3	B	B	402	317	480	314
			R	6.8	5.6	A	A	139	64	225	203
		SB	L	56.8	44.8	E	D	165	59	223	124
			T	5.4	4.8	A	A	140	150	229	230

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



8.4 2028 BUILD WITH IMPROVEMENTS

8.4.1 Proposed Improvements

Paramount Parkway at Carrington Mill Boulevard

- Extend the northbound right turn lane on Carrington Mill Boulevard to 250 feet of full-width storage and appropriate taper.

Paramount Parkway at 4200 Paramount Parkway / Proposed Driveway

- Construct the proposed driveway as a restricted-movement access point with two ingress and one egress lane. Access at the driveway is recommended to be limited to left-turns in, right-turns in, and right-turns out. That is, left turns and thru out of the driveway are prohibited.
- Construct an exclusive right-turn lane with 200 feet of full-width storage and appropriate taper.

Paramount Parkway at 4000 Paramount Parkway / Proposed Driveway

- Construct the proposed driveway as a full-movement access point with one ingress and one egress lane.

Paramount Parkway at Perimeter Park Drive

- Extend the northbound left turn lane on Perimeter Park Drive to the maximum amount of full-width storage and appropriate taper without encroaching on the existing southbound left turn lane at the IQVIA Biotech intersection.

NC 54 (Chapel Hill Road) at Watkins Road

- Extend the northbound right turn lane on NC 54 (Chapel Hill Road) to 175 feet of full-width storage and appropriate taper.



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Capacity Analysis: Parkside Middle School

March 13, 2026

8.4.2 Analysis Results

With the recommended improvements in place, the overall study intersections operate at an acceptable LOS with the exception of the intersection of the proposed driveway at 4200 Paramount Parkway where the southbound approach (i.e., exiting the office development) operates at LOS F in the AM peak hour. The volume of traffic making this movement is minimal and projected to be 1 vehicle per hour. Furthermore, with the recommended improvements in place, the delay on this approach is greatly reduced when compared to the results of the 2028 Build scenario.

Synchro LOS and delay results for the 2028 Build Improved analysis scenario are listed in Table 8. Instances where the lane group operates at LOS E or F are highlighted in the table and listed below.

- Paramount Parkway at Carrington Mill Boulevard – EBLTR – AM peak hour.
- Paramount Parkway at 4200 Paramount Parkway / MS Entrance – SBLTR – AM peak hour.
- Paramount Parkway at Perimeter Park Drive – NBL – AM peak hour; EBTR – AM and PM peak hours.
- NC 54 at Watkins Road – SBL – AM peak hour.

It should be noted that the maximum queue for the northbound left turn movement at the Paramount Parkway at Perimeter Park Drive intersection is 334 feet in the AM peak hour. Due to the existing southbound left turn lane at the Paramount Parkway at IQVIA Biotech Driveway to the south, this storage length cannot be accommodated. We would recommend providing the maximum storage for the northbound left turn lane to mitigate as much spillback as possible into the through lanes on Perimeter Park Drive.

The maximum queue for the northbound right turn lane at the NC 54 at Watkins Road intersection is expected to exceed the recommended full-width storage length of 175 feet in both peak hours. However, providing additional storage to 225 feet would impact the adjacent driveway for the Welcome Federal Credit Union. As the current spillback rate for the 175-foot turn lane is only 3% in the AM peak hour and 0% in the PM peak hour out of a 30-minute analysis period, we believe that a 175-foot turn lane would be sufficient for the northbound right turn movement at this intersection.



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

Capacity Analysis: Parkside Middle School

March 13, 2026

Table 12: 2028 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
	NC 54 at Carrington Mill Boulevard	Overall		19.8	12.7	B	B				
		WB	L	46.2	40.0	D	D	35	60	57	100
			R	11.1	20.6	B	C	28	70	59	92
		NB	T	21.6	8.1	C	A	161	154	303	297
			R	10.7	2.6	B	A	45	12	93	57
		SB	L	38.7	52.1	D	D	349	135	538	220
			T	3.0	3.0	A	A	115	108	525	139
	Paramount Parkway at Carrington Mill Boulevard	Overall		10.9	20.3	B	C				
		EB	LTR	56.5	63.0	E	E	30	56	44	74
		WB	L	26.7	20.7	C	C	25	50	49	128
			LTR	26.8	20.8	C	C	28	54	78	128
		NB	R	13.4	4.8	B	A	13	6	61	68
			L	10.5	22.8	B	C	29	9	37	8
		SB	T	12.9	21.2	B	C	166	31	177	21
			R	2.4	1.6	A	A	28	6	295	158
		SB	L	28.7	40.7	C	D	32	39	34	33
			TR	40.2	33.9	D	C	45	95	41	52
	Paramount Parkway at 4200 Paramount Parkway / MS Entrance	NB	R	14.5	10.0	B	B	118	33	177	143
		EB	LT	7.5	7.5	A	A	3	3	49	23
		WB	LT	10.8	8.1	B	A	53	10	350	53
		SB	LTR	72.3	11.8	F	B	13	5	22	44
	Paramount Parkway at 4000 Paramount Parkway / HS Entrance	NB	LTR	15.9	10.7	C	B	10	8	70	63
		EB	LT	8.3	7.6	A	A	3	0	56	12
		WB	LT	9.0	8.0	A	A	5	3	152	52
		SB	L	19.0	11.7	C	B	3	3	23	32
			R	8.8	8.6	A	A	0	0	25	31
	Paramount Parkway at Perimeter Park Drive	Overall		51.6	30.5	D	C				
		EB	L	19.6	34.6	B	C	45	104	116	158
			TR	58.4	56.4	E	E	694	325	434	312
		WB	LTR	27.9	33.5	C	C	18	20	25	25
		NB	L	57.8	10.7	E	B	220	58	334	91
			TR	19.1	11.5	B	B	44	54	148	68
		SB	L	18.3	11.0	B	B	8	7	16	16
TR	50.1		18.2	D	B	258	93	407	109		
	NC 54 at Watkins Road	Overall		22.4	21.0	C	C				
		WB	L	50.2	51.9	D	D	109	131	252	240
			R	38.1	42.8	D	D	218	312	310	390
		NB	T	19.8	18.3	B	B	402	317	450	337
			R	6.8	5.6	A	A	139	64	275	245
		SB	L	56.8	44.8	E	D	165	59	202	96
			T	5.4	4.8	A	A	40	150	220	209

Intersection or Lane Group Operates at LOS E



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9.0 TRAFFIC SIGNAL WARRANTS

Town of Morrisville Staff requested a review of the intersection of 4000 Paramount Parkway against the criteria established in the Manual on Uniform Traffic Control Devices (MUTCD). As discussed in section 2.2.2, this easternmost driveway provides full movement ingress and egress access for the following modes of traffic to/from the school:

- High school parents (i.e., carpool);
- High school students;
- High school staff;
- Middle school staff;
- Middle school buses; and
- Service vehicles.

The MUTCD outlines nine traffic signal warrants which can be evaluated to determine the need for signalization under various conditions. The warrants are:

- Warrant 1: Eight-Hour Vehicular Volume
- Warrant 2: Four-Hour Vehicular Volume
- Warrant 3: Peak Hour Vehicular Volume
- Warrant 4: Pedestrian Volume
- Warrant 5: School Crossing
- Warrant 6: Coordinated Signal System
- Warrant 7: Crash Experience
- Warrant 8: Roadway Network
- Warrant 9: Intersection Near a Grade Crossing.

For this study, Town staff requested an evaluation against Warrants 2, 3, 4, and 5. Due to the nature of the proposed development and the location, the other warrants were determined to not apply to this location.

9.1 WARRANT 2: FOUR HOUR VEHICULAR VOLUME

Warrant 2 is intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal over a four-hour period. Table 13 lists the traffic volumes that are expected to occur over a four-hour period in the AM and PM periods surrounding arrival and dismissal:

Table 13: Four-Hour Volumes

Traffic	AM Arrival Driveway Volume (vehicles unless otherwise noted)	PM Dismissal Driveway Volume (vehicles unless otherwise noted)
High School Parents	18	22
High School Staff	18	18
Middle School Staff	95	95
Middle School Buses	20	20
Total Volume	151	155
Average Hourly Volume	37.75 vehicles per hour	38.75 vehicles per hour



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The minimum volume of traffic using the minor street, which in this case is the school driveway, is 80 vehicles per hour. Therefore, this location is below the minimum volumes established by warrant 4.

9.2 WARRANT 3: PEAK HOUR VEHICULAR VOLUME

This warrant is intended for use in a location where traffic conditions are such that for a minimum of one hour of an average day, the minor street traffic suffers undue delay when entering or crossing the major street. This warrant is intended to be used in locations where high-occupancy vehicle facilities attract or discharge large numbers of vehicles over a brief period. Table 14 lists the peak hour volumes for both schools:

Table 14: Peak Hour Volumes

Peak Hour	Driveway Volume (vehicles per hour)
Parkside Middle School AM	25
Parkside Middle School PM	31
WECIB AM	14
WECIB PM	32

The minimum volume of traffic using the minor street, which in this case is the school driveway, is 100 vehicles per hour. Therefore, this location is below the minimum volumes established by warrant 3.

9.3 WARRANT 4: PEDESTRIAN VOLUME

The pedestrian volume signal warrant is intended for locations where the traffic volume on a major street is high enough that pedestrians experience excessive delays in crossing the major street. There are two thresholds to meet this warrant, an average pedestrian volume across four hours and a pedestrian volume in one hour. Both of these thresholds have minimums that need to be met. Those are as follows:

- Pedestrian Four-Hour Volume: 107 pedestrians crossing the major street per hour
- Pedestrian Peak Hour Volume: 133 pedestrians crossing the major street per hour

As shown in the collected traffic counts, there are currently no pedestrians crossing Paramount Parkway near the subject driveway. Due to development in the area consisting of non-residential uses, pedestrian volumes associated with the school are anticipated to be minimal and therefore below the aforementioned minimum volumes established by warrant 4.



9.4 WARRANT 5: SCHOOL CROSSING

Warrant 5 is intended for locations where schoolchildren are crossing the major street is substantial enough that justifies installation of a traffic signal. Guidance provided in the MUTCD is as follows:

“The need for a traffic control signal should be considered when an engineering study of the frequency and adequacy of gaps in the vehicular traffic stream as related to the number and size of groups of schoolchildren at an established school crossing across the major street shows that the number of adequate gaps in the traffic stream during the period and there are a minimum of 20 schoolchildren during the highest crossing hour.”

As the school is not yet constructed, there are currently no schoolchildren crossing Paramount Parkway. Furthermore, residential development within a walking distance from the proposed school is minimal. Currently, the ARIUM at Perimeter Park is the only residential development located within a reasonable walking distance from the site and the location of this development does not require a crossing of Paramount Parkway. Accordingly, it is not anticipated that the criteria for this warrant will be met when the proposed school is constructed.

9.5 CONCLUSIONS

Based on the discussion presented herein, the proposed driveway at 4000 Paramount Parkway is not anticipated to meet the minimum criteria needed to satisfy the four warrants.



10.0 RECOMMENDATIONS

Based on the findings of this study, specific improvements have been identified and should be completed as part of the proposed development. The recommendations are shown in Figure ES-1 below.

Internal Site Layout: Parkside Middle School

- The internal driveway configuration should provide a minimum of 2298 feet of storage space to accommodate queuing vehicles. This will meet the “high demand length” requirement set by the MSTA School Traffic Calculator.

Internal Site Layout: WECIB

- The internal driveway configuration should provide a minimum of 389 feet of storage space to accommodate queuing vehicles. This will meet the “high demand length” requirement set by the MSTA School Traffic Calculator.

Paramount Parkway at Carrington Mill Boulevard

- Extend the northbound right turn lane on Carrington Mill Boulevard to 250 feet of full-width storage and appropriate taper.

Paramount Parkway at 4200 Paramount Parkway / Proposed Driveway

- Construct the proposed driveway as a restricted-movement access point with two ingress and one egress lane. Access at the driveway is recommended to be limited to left-turns in, right-turns in, and right-turns out. That is, left turns and thrus out of the driveway are prohibited.
- Construct an exclusive right-turn lane with 200 feet of full-width storage and appropriate taper.

Paramount Parkway at 4000 Paramount Parkway / Proposed Driveway

- Construct the proposed driveway as a full-movement access point with one ingress and one egress lane.

Paramount Parkway at Perimeter Park Drive

- Extend the northbound left turn lane on Perimeter Park Drive to the maximum amount of full-width storage and appropriate taper without encroaching on the existing southbound left turn lane at the IQVIA Biotech intersection.

NC 54 (Chapel Hill Road) at Watkins Road

- Extend the northbound right turn lane on NC 54 (Chapel Hill Road) to 175 feet of full-width storage and appropriate taper.

NC 54 (Chapel Hill Road) at Carrington Mill Boulevard

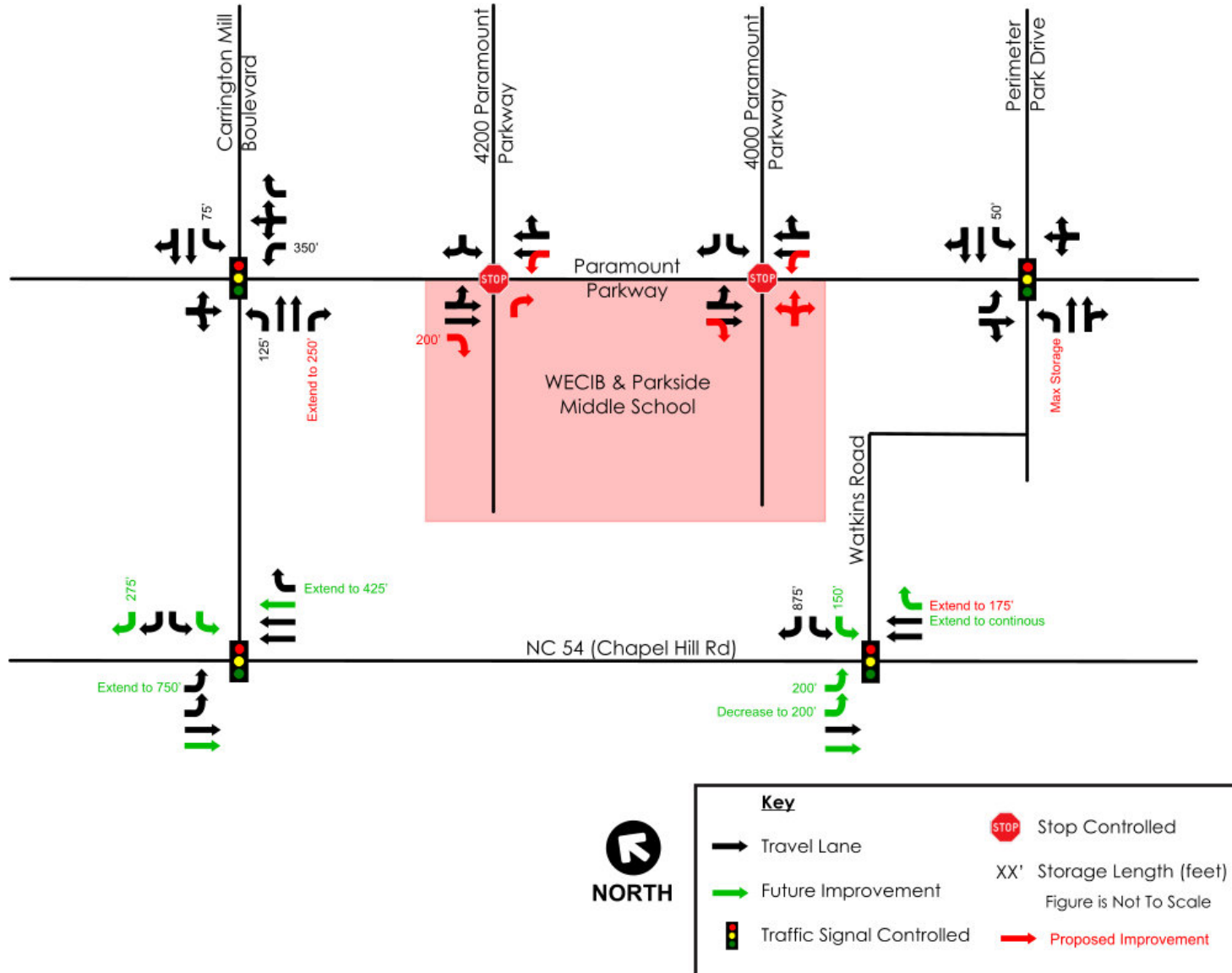
- No improvements are recommended at this intersection.



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Figure ES-1: Recommended Improvements



PARAMOUNT PARKWAY SCHOOLS TRAFFIC IMPACT ANALYSIS

References

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11.0 REFERENCES

¹**Town of Morrisville Comprehensive Transportation Plan**, Town of Morrisville, adopted 2019 <https://user-cighrlw.cld.bz/Comprehensive-Transportation-Plan-March-20192>

²**NCDOT Interactive Traffic Volume Map**,
<https://ncdot.maps.arcgis.com/home/webmap/viewer.html?webmap=b7a26d6d8abd419f8c27f58a607b25a1>

³**School Calculator**, North Carolina Department of Transportation (NCDOT) Municipal School Transportation Assistance (MSTA).
<https://connect.ncdot.gov/municipalities/School/Documents/SchoolCalculator.zip>

⁴**Highway Capacity Manual 7th Edition: A Guide for Multimodal Mobility Analysis**, *Transportation Research Board*, 2022

⁵ **NCDOT Congestion Management Capacity Analysis Guidelines Standards**, *NCDOT*, March 2022
<https://connect.ncdot.gov/resources/safety/Congestion%20Mngmt%20and%20Signing/Standards%20-%20Capacity%20Analysis%20Guidelines.pdf>

⁶ **Policy on Street and Driveway Access to North Carolina Highways**, *NCDOT*, July 2003
<https://connect.ncdot.gov/resources/safety/Congestion%20Mngmt%20and%20Signing/Congestion%20Management/Policy%20on%20Street%20and%20Driveway%20Access%20to%20North%20Carolina%20Highways%20Current%20Edition%20July%202003.pdf>



12.0 APPENDIX

A link to the following files is provided via Microsoft OneDrive:

- Site Plan
- Annotated Site Plan
- Memorandum of Understanding
- Traffic Signal Plans
- Raw Traffic Count Data
- Approved Development Traffic Studies
- Traffic Volume Calculations
- Synchro Files
- SimTraffic Reports

