

# **Local Area Transportation Report**

## **Holton Arms School**

**Bethesda, Maryland**

**December 12, 2024**

**Exhibit 9**  
**CBA-1174-E**

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## Executive Summary

This report is a Local Area Transportation Review (LATR) for the Holton Arms School's proposed enrollment increase in Bethesda, Maryland.

### Proposed Project

The site's current and proposed use is a school. Under existing conditions the school is limited to an enrollment cap of 670 students during the school year and during summer camp. The Holton Arms School seeks to increase its enrollment cap to 870 students during the school year and 970 campers during the summer. No increase in square footage or other construction is proposed with this application. The project site is in the Bethesda/Chevy Chase Policy Area (Policy Area 3).

The site is accessed via Royal Dominion Drive at its intersection with River Road (MD-190). Royal Dominion Drive connects to the site's parking and pick-up/drop-off area.

The school property also has frontage on Burdette Road; however, no vehicle or pedestrian access is available from Burdette Road. There are no plans to activate this frontage—or to add secondary access beyond the current Royal Dominion Drive access.

The existing and proposed trip generation summary for the school year and for the summer is shown in Table 1. Trip generation was calculated based on inbound and outbound volumes going into the site driveway at the River Road (MD-190) & Royal Dominion Drive intersection using traffic counts collected while school was in session on Tuesday, January 30, 2024, and during the summer on Thursday, June 27, 2024 and Tuesday, July 23, 2024.

### Adequacy Determination

Since the project will result in greater than 50 net trips, a full LATR study is required to assess the impact of the project and assess the adequacy of the nearby transportation facilities. This includes a review of each of the applicable modes of transportation- motor vehicle system adequacy, pedestrian network adequacy, bicycle network adequacy, and transit system adequacy. **Study areas were determined using both July 2023 LATR Guidelines and the 2024-2028 Growth and Infrastructure Policy (GIP), the study area chosen being the larger of the two.**

### Motor Vehicle System Adequacy

A capacity analysis was completed to compare the future roadway conditions with and without the proposed enrollment cap increases. Given the Project's location within an Orange policy area, both HCM and CLV analyses were required. The results of the HCM and CLV analysis indicate that the Project would not increase delays or CLVs beyond the relevant allowable congestion standards at any of the study intersections. Signal timing adjustments will be necessary in the future with and without the proposed school to optimize operations along River Road due to an increase in roadway volumes associated with background developments.

As requested by Staff, a queueing analysis was also conducted at the study intersections.

**Based on the conducted analyses, recommended changes in intersection geometry and phasing at the intersection of Riverdale Road (MD-190) & Royal Dominion Drive are identified in this report, along with changes to signal timings along the River Road corridor.**

### Pedestrian System Adequacy

A review of the existing pedestrian system was conducted in accordance with the LATR Guidelines. The review covered Pedestrian Level of Comfort (PLOC) adequacy, Americans with Disabilities Act (ADA) compliance, and street lighting adequacy.

- PLOC Walkshed distance: 900 feet
- ADA Walkshed distance: 450 feet

### Bicycle System Adequacy

An evaluation of the existing bicycle system was conducted in accordance with the LATR Guidelines. This review was based on the County's Bicycle Level of Traffic Stress (BLTS) methodology and the Bicycle Master Plan.

- BLTS Bikeshed distance: 1,000 feet

### Transit System Adequacy

The transit system adequacy test consisted of evaluating the amenities present at bus stops within a specified distance from the project site.

- Transit Walkshed Distance: 1,500 feet
- Applicable number of bus shelters: 3

### Vision Zero Statement

As part of the project's Vision Zero Statement, conditions around the project site were evaluated to determine if safety measures may be needed to address safety issues.

As discussed herein, the site is located along River Road (MD-190), part of the High Injury Network (HIN). The project is not

anticipated to provide any improvements beyond mitigation to the site's traffic impact.

### Project Impact and Off-Site Improvements Summary

The project does not increase the school's square footage, and therefore is not required by the LATR proportionality guide to make any improvements.

**Table 1: Existing and Proposed Trip Generation Summary**

Condition	Enrollment	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Existing and Approved Conditions							
Approved Academic Year Enrollment Cap	670 students	537	331	868	161	311	472
Trip Generation Rate Derived from January 2024 Counts		0.80	0.49	1.30	0.24	0.46	0.70
Existing Summer Enrollment (Summer Session # 1)	664 students	423	341	764	281	333	614
Trip Generation Rate Derived from June 2024 Counts		0.64	0.51	1.15	0.42	0.50	0.92
Existing Summer Enrollment (Summer Session # 2)	665 students	430	340	770	253	330	583
Trip Generation Rate Derived from July 2024 Counts		0.65	0.51	1.16	0.38	0.50	0.88
Approved Summer Enrollment Trip Generation <sup>1</sup>	670 students	433	343	776	284	336	620
Trip Generation Rate based on Summer 2024 Counts		0.65	0.51	1.16	0.42	0.50	0.92
Proposed Conditions							
Proposed School Year Enrollment	870 students	697	430	1,127	209	404	613
Trip Generation Rate based on January 2024 Counts		0.80	0.49	1.30	0.24	0.46	0.70
Proposed Academic Year Enrollment - Approved Academic Year Enrollment <sup>2</sup>		160	99	259	48	93	141
Proposed Summer Enrollment	970 students	627	496	1,123	410	487	897
Trip Generation Rate based on Summer 2024 Counts		0.65	0.51	1.16	0.42	0.50	0.92
Proposed Summer Trip Generation with Modified Dismissal	805 students <sup>3</sup>	-	-	-	341	403	744
Trip Generation Rate based on Summer 2024 Counts		-	-	-	0.42	0.50	0.92
Proposed Summer Enrollment - Approved Summer Enrollment <sup>4</sup>		194	153	347	126	151	277
Campers Dismissed During PM Peak Hour – Approved Summer Enrollment <sup>5</sup>		-	-	-	57	67	124
Proposed Summer Enrollment - Proposed Academic Year Enrollment <sup>6</sup>		-70	66	-4	201	83	284

**Notes:**

1. The School is approved to have a summer enrollment of 670 students. Because enrollment in the Summer of 2024 did not reach 670, the trip generation is presented for the approved summer enrollment using the higher trip generation rates for each peak hour.
2. To evaluate the proposed academic year enrollment increase, the impact on 259 AM new trips during the School Peak with the corresponding roadway volumes at this time (7:15-8:15 AM) and the impact of 141 new trips during the School's dismissal peak (3:15-4:15 PM) with the roadway's peak hour volumes at (3:30-4:30 PM) are analyzed in this report.
3. & 5. Due to the proposed staggered summer camp dismissals, only 805 of the 970 proposed students will be dismissed during the Summer PM Peak Hour (2:30-3:30 PM). See Table 3 for calculations.
4. & 6. The new Summer School AM trips are not analyzed because the trip generation rate is lower than it is during the School Year (a comparison of trip generation between 970 summer campers and 870 school year students is -4) and because the summer roadway volumes are lower than in the school year, the analysis would not identify any adequacy findings beyond those established in the AM School Year analysis for 870 students. To analyze the Summer School PM trips, an analysis of the net new 277 trips is presented in this report using the school year roadway volumes during the Summer School PM dismissal (2:30-3:30 PM)

Introduction

This report reviews the transportation elements of the Holton-Arms School. The site, shown in Figure 1, is located within the Bethesda/Chevy Chase Policy Area in Bethesda, Maryland.

The purpose of this report is to:

- 1. Review the transportation elements of the school expansion plan and assess the adequacy of relevant transportation facilities, as outlined in the County’s GIP and LATR guidelines.
- 2. Provide information to the Montgomery County Park and Planning Commission (Maryland-National Capital Park and Planning Commission/M-NCPPC), the Montgomery County Department of Transportation (MCDOT), and the Maryland State Highway Administration (SHA) on how the site will influence the local transportation network. This report accomplishes this by identifying the potential trips generated by the site on all major modes of travel.
- 3. Examine the current state of the surrounding multimodal transportation network and identify potential improvement needed, if any, to improve the network to acceptable conditions.

Development Program Overview

The site’s current and proposed use is the Holton-Arms School, with no proposed change in square footage. The school seeks to increase their enrollment cap to 870 students for the school year enrollment and 970 campers for summer camp enrollment. Their current enrollment cap (for both the school year and summer camp) is 670 students.

Study Area Overview

Overview of Regional Access

Under existing conditions, the proposed development site has

access to regional vehicular and transit-based transportation options, as shown in Figure 2, that connect the site to destinations within Virginia, the District, and Maryland.

The site has a direct frontage on River Road (MD-190), which connects to the Capital Beltway (I-495) that surrounds Washington, DC and its inner suburbs. The Capital Beltway (I-495) is less than ½ mile from the site. River Road (MD-190) also connects to Goldsboro Road (MD-614) and Wilson Lane (MD-188).

Although the site has frontage on Burdette Road, there is no vehicular or pedestrian connection to the school campus and is thus not an access point for the site.

The site has direct access to WMATA bus route T2, providing service to the Rockville and Friendship Heights Metrorail stations, with half-hourly frequencies during weekdays.

Overall, the site has access to several regional roadways and transit, making it convenient to travel between the site and destinations in the District, Virginia, and Maryland.

Overview of Local Access

There are several local transportation options near the site that serve vehicular, transit, walking, and cycling trips under existing conditions, as shown.

The site is directly served by River Road (MD-190), a Downtown Boulevard, and is surrounded by Neighborhood Connectors and local streets. Table 2 provides a list of the local roadways in the project study area.

Conventional (unprotected) bicycle lanes exist on portions of River Road (MD-190)—the only bicycle infrastructure near the site. However, the Montgomery County *Bicycle Master Plan* identifies significant planned improvements in the form of sidepaths on both sides of River Road (MD-190).

Table 2: Summary of Study Area Roadways

Roadway	Jurisdiction	Functional Classification (MDOT SHA/MPOHT)	Rural vs Urban	# of Lanes	Speed Limit
River Road (MD-190)	MDOT SHA	Principal Arterial/Boulevard	Urban	4-7	45 MPH
Burdette Road	MCDOT	Local/Neighborhood Connector	Urban	2-3	25 MPH
Royal Dominion Drive	MCDOT	Local/Local	Urban	2-4	25 MPH
Nevis Road/Beech Tree Road	MCDOT	Local/Local	Urban	2-3	25 MPH
Arrowood Road	MCDOT	Local/Local	Urban	2	25 MPH
Hillmead Road	MCDOT	Local/Local	Urban	2	25 MPH

There is some pedestrian infrastructure in the vicinity of the site, but there are gaps in connectivity. Gaps are in the form of missing sidewalks and insufficient sidewalk widths along River Road (MD-190), as well as missing or inadequate crosswalks.

## ***Contents of Study***

This report contains six (6) sections as follows:

### ***Section 1: Adequacy Determination***

This section reviews the transportation components, travel demands and the adequacy requirements of the Holton-Arms School expansion.

### ***Section 2: LATR Vision Zero Statement***

This section outlines the required Vision Zero Statement for the project. It includes a review of the High Injury Network, history of crashes around the site, and traffic speeds around the site to determine if measures to manage safety issues around the project may be warranted.

### ***Section 3: Traffic Operations***

This section provides a summary of the existing roadway facilities and an analysis of the existing and future roadway capacity in the study area. This section highlights the vehicular impacts of the project, including presenting mitigation measures as needed.

### ***Section 4: Pedestrian Facilities***

This section summarizes existing and future pedestrian access to the site, outlines impact, and presents recommendations, as needed. The pedestrian system adequacy test is also presented in this section. The pedestrian system adequacy test includes a review of the following:

- Pedestrian Level of Comfort (PLOC) adequacy
- American with Disabilities Act (ADA) compliance
- Streetlight network

The findings of each individual component are presented along with specific potential improvements that would achieve adequacy, if deemed necessary and feasible.

### ***Section 5: Bicycle Facilities***

This section summarizes existing and future bicycle access to the site, reviews the quality of cycling routes to and from the project site, outlines impact, and presents recommendations, as needed. The bicycle system adequacy test is also presented in this section, including a discussion of potential

improvements that would achieve adequacy, if deemed necessary and feasible. The bicycle system adequacy test includes a review of the Bicycle Level of Traffic Stress (BLTS) within the study area.

### ***Section 6: Transit Facilities***

This section summarizes the existing and future transit service adjacent to the site, reviews how the project's transit demand will be accommodated, outlines impact, and presents recommendations, as needed. The transit system adequacy test is also presented in this section, including a discussion of potential improvements that would achieve adequacy, if deemed necessary and feasible.





Figure 1: Site Aerial



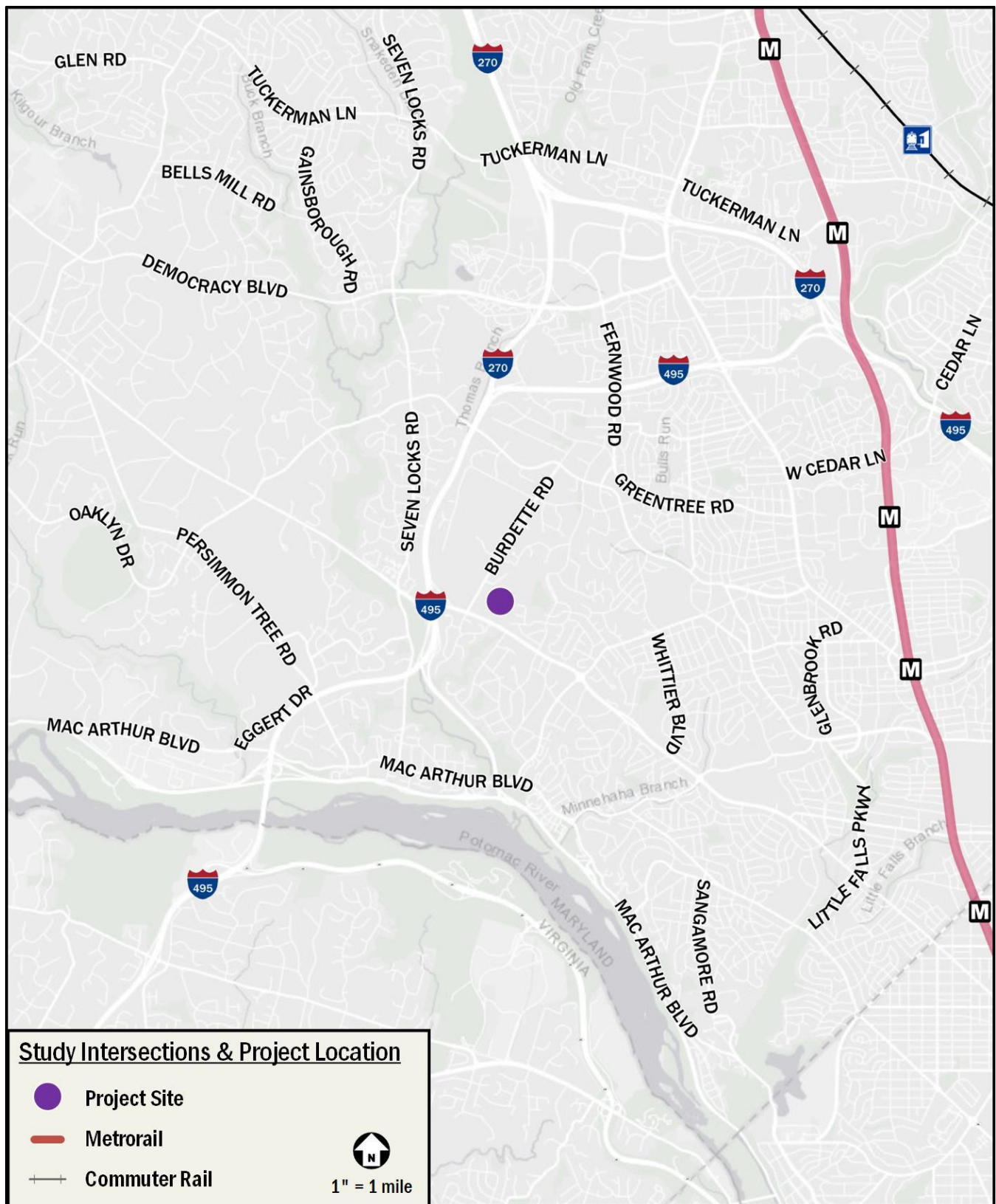


Figure 2: Project Location and Transportation Facilities

Section 1: Project Design and Adequacy Determination

This section reviews the transportation components, travel demands and the adequacy requirements of the Holton Arms School project.

Project Description

The proposed development site is located at 7303 River Road, in Bethesda, Maryland and is bounded by River Road (MD-190) to the south, residential properties to the east, north, and west, park land to the east, and a commercial development to the west.

The school seeks to increase their current enrollment cap to 870 students for the school year enrollment and 970 campers for summer camp enrollment. The current enrollment cap (for both the school year and summer camp) is 670 students. **The project does not include new construction or an increase in floor area.**

School Profile and Hours

The Holton Arms School serves ages 8 to 18 in grades 3-6 (Lower School), grades 7-8 (Middle School), and grades 9-12 (Upper School) during the academic year.

During the academic year, students arrive at 8:00 AM and dismissal for most grades takes place at 3:30 PM. The lower school has two (2) dismissal times at 3:30 PM and 4:30 PM. Athletics and other extracurricular activities dismiss after 3:30 PM.

Summer Camp

The Holton Arms School Summer Programs serve campers from age 4 to 18.

As part of the existing summer camp operations, campers arrive by 9:00 AM and the main dismissal takes place at 3:00 PM.

Modified summer camp operations to stagger arrivals and dismissals and to the summer camp operations are proposed to limit the impact of summer camp operations. Depending on their program, campers will arrive by 9:00 AM, 9:30 AM, and 12:00 PM. Dismissals will take place at 12:00 PM, 3:00 PM, 3:30 PM, and 4:00 PM.

Table 3 outlines the different summer camps offered and anticipated number of summer campers registered for each for the purpose of trip generation and to identify the number of summer campers dismissed during the peak hour. Registration

numbers will vary and this analysis takes a conservative approach by assuming and evaluating that the majority of students (over 80%) will be dismissed in the peak hour.

Table 3: Summer PM Peak Hour Trip Generation

Camp	Start Time	Dismissal	# of Campers
Creative Campers	9:00 AM	3:00 PM	190
Creative Kids	9:30 AM	3:30 PM	615
Sports and Discovery (full)	9:30 AM	4:00 PM	100
Sports and Discovery (half)	9:00 AM	12:00 PM	25
Sports and Discovery (half)	9:30 AM	12:00 PM	25
Sports and Discovery (half)	12:00 PM	4:00 PM	15
Total Dismissals			
Total Campers Dismissed at 12:00 PM			50
Total Campers Dismissed at 3:00 PM			190
Total Campers Dismissed at 3:30 PM			615
Total Campers Dismissed at 4:00 PM			115
Total Campers Dismissed During School PM Peak Hour			805

School Bus Program

The School also operates a robust bus program with 12 bus routes during the academic year and 7 bus routes during the summer.

Based on the existing bus ridership of 28%, approximately 16 buses are estimated to support the proposed 870 student enrollment during the school year.

Access and Circulation

Non-Auto Access

Pedestrian and bicycle access to the site is available via Royal Dominion Drive. There are also internal connections to the surrounding residential neighborhoods used by both staff and students. An internal pathway network connects pedestrians to the school's main building and athletic facilities.

Vehicular Access

Access to the site is available via Royal Dominion Drive, which provides access to the site's parking, pick-up/drop-off area, and loading facilities.

### **Site Circulation**

A site visit was conducted on November 21, 2024, a typical school day, to observe site circulation and internal operations. Observations were taken from 7:30-8:30 AM and 2:30-4:45 PM. Pick-up/drop-off circulation is shown in Figure 3.

Lower School pick-up/drop-off occurs at the upper lot with parents using Delancey Street (internal road) and queuing at the Lower School's entrance. There is 1,700 feet of queueing space, though observed queues were contained entirely within the Lower School parking lot and the driveway loop.

Upper School pick-up and drop-off occurs in the lower lot, with parents queuing on the school's driveway and in the parking lot. Queuing was contained within the site.

Overall, internal operations are run efficiently, with ample staff directing traffic and ensuring that pick-up and drop-off periods run smoothly. Parents were not observed parking and entering the building with their students.

Future operations and circulation with the increased enrollment will be modified as needed to ensure no spillback onto River Road occurs and may include additional staff as required.

Additional queueing of vehicles generated by the proposed enrollment caps can be accommodated on site.

### **Parking**

There are 310 parking spaces on site that include gravel spaces, handicap spaces, and parallel parking). Parking spaces are distributed throughout the site, with spaces available on the western side of the site near the entrance to the Lower School and spaces also available on the eastern side of the site near the entrance to the Upper School.

### **Trip Generation**

Trip generation was calculated based on inbound and outbound volumes going into the site driveway at the River Road (MD-190)

& Royal Dominion Drive intersection using traffic counts collected while school was in session on Tuesday January 30, 2024, and while the summer camp was in session on Thursday June 27<sup>th</sup> 2024 and Tuesday July 23<sup>rd</sup> 2024.

Trip generation rates were calculated for the following analysis periods (these were the peak hours in the Turning Movement Count data):

- School AM Peak Hour (7:15-8:15 AM)
- Roadway PM Peak Hour (3:15-4:15 PM) using School PM Peak Hour trip generation rates (3:30-4:30 PM) for a conservative analysis
- Summer PM Peak Hour (2:30-3:30 PM)

Summer PM Peak Hour trip generation in the Total Future and Total Future Mitigated scenarios was calculated using the summer camp's staggered dismissals. Only campers dismissed between 2:30-3:30 PM were used to determine the PM Peak Hour trip generation, as other campers would be dismissed outside of the peak hour and would not generate site trips during this period. A trip generation summary is shown in Table 1. Detailed trip generation tables are included in the technical attachments.



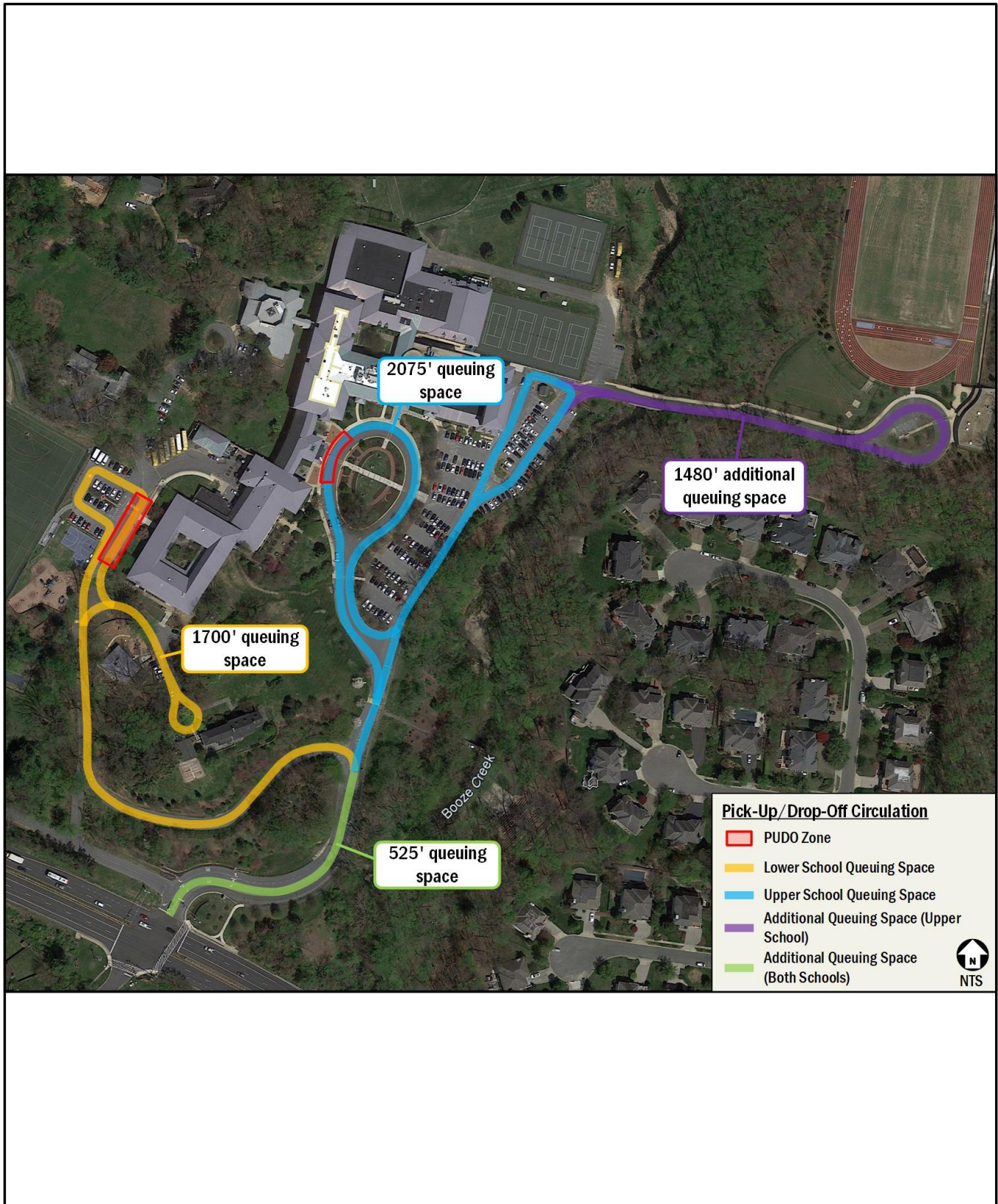


Figure 3: Pick-Up/Drop-Off Circulation

## Section 2: Vision Zero Statement

This chapter outlines the project's Vision Zero Statement. The purpose of this statement is to assess high-injury roadways and safety issues in the vicinity of the project site and propose solutions as needed. This chapter also reviews traffic speeds around the site and describes site access in relation to existing safety issues.

For any project generating 50+ net new peak-hour weekday trips, a Vision Zero Statement must be developed with the project made of up the following:

- High Injury Network (HIN) Review to determine if the project is located within a specified proximity of any roadway segments with a designated HIN designation.
- Crash History Review to review crash data within a specified distance near the project site.
- Speed Studies within specified distance from the site frontage to document the average and 85<sup>th</sup> percentile speeds in the area along with the 10-mile per hour pace.

The following conclusions are reached within this chapter:

- The River Road High Injury Network designated roadway segment is located near the project site.
- The speed limit on River Road was lowered from 45 mph to 35 mph in 2018.
- Neither 85<sup>th</sup> percentile speeds nor 10-mile pace at any speed study location exceeded their corresponding posted speed limit by 20 percent.
- Neither 85<sup>th</sup> percentile speeds nor 10-mile pace at any speed study location exceeded their corresponding posted speed limit by 12 mph, the threshold at which automated citations are issued.

These are discussed in detail in the following sections.

### **High Injury Network Review**

High Injury Network (HIN) segments within 900-foot walkshed beyond the site frontage must be documented and reviewed.

#### **The HIN segment along River Road was identified within a 900-foot walkshed from the Project.**

Within the 900-foot walkshed, River Road is divided four (4) lane roadway with a 35 mph posted speed limit. In the vicinity of the project site, the River Road average daily traffic (AADT) is 37,060 based on SHA volume data (2023).

In the vicinity of the project site and study area, there is limited pedestrian infrastructure with short segments of sidewalk available near bus stops. Bicycle infrastructure is available along River Road in the form of conventional unprotected bike lanes and no bicycle lanes are provided within the presence of acceleration/deceleration lanes. The adequacy of the Pedestrian and Bicycle networks are discussed in more detail in the Pedestrian System Adequacy and Bicycle System Adequacy sections of this report.

There is a completed Vision Zero project along this same segment, where the speed limit was lowered from 45 mph to 35 mph.

The crashes within the River Road High Injury Network are reviewed in the next section of this report.

### **Proximate Safety Issues**

Using Montgomery County's Open Data Portal for Crash Reporting – Incidents Data for crashes between 2019 and 2024, crashes were reviewed within a 900-foot walkshed around the project site. Severe and fatal crashes within the past five (5) years are summarized in Table 4. The reviewed crashes are shown in Figure 4. The reviewed collision data is summarized as follows:

- One (1) fatal crash was documented at the intersection of River Road and Burdette Road in May 2020;
  - This crash involved a vehicle and a motorcycle at approximately 10pm.
  - Collision type records indicate this crash was a "straight movement angle" collision, involving a vehicle making a left-turn onto Burdette Road.
  - This crash occurred outside typical conditions during the COVID-19 pandemic when school was not in session, in the evening hours, and excessive speeds were often observed with low roadway volumes.
- No other crashes are categorized as major injury crashes were documented within the study area within the past five (5) years;
- No crashes involving pedestrians or bicycles were documented in the study area within the past five (5) years;

- The majority of the crashes within the study area are categorized as “same direction rear end” or “front to rear” crashes.

Speed Study

As part of the LATR Vision Zero Statement, speed studies were conducted at the following locations:

- Burdette Road, north of Burdette Court
- River Road (MD-190), between I-495 Ramps and Burdette Road
- River Road (MD-190), between Royal Dominion Drive and Beech Tree Road

The 48-hour speed data was collected on Tuesday, October 8, 2024 and Wednesday, October 9, 2024. Schools were in session on the days speed data was collected. The speed data collected is included in the Technical Attachments.

Table 5 summarizes the observed speed data, including the 50<sup>th</sup> and 85<sup>th</sup> percentile speeds for each observation day and each direction at the study location. The speed data reports are included in the Technical Attachments.

The speed study results are summarized as follows:

- Burdette Road, 200 ft north of Burdette Court
  - The upper limit of the 10-mile pace in the northbound and southbound direction exceeded the posted speed limit by 20 percent, or at least 5 mph over the posted speed limit of 25 mph, on both days.
- None of the observed 85<sup>th</sup> percentile speeds in the area exceed the posted speed limit by 20 percent. More specifically:
  - 85<sup>th</sup> percentile speeds on River Road are under 42 mph and do not exceed the posted speed limit of 35 mph by 20 percent or 7 mph.
  - 85<sup>th</sup> percentile speeds on Burdette Road are 30 mph or under and do not exceed the posted speed limit of 25 mph by 20 percent or 5 mph

Additionally, none of the 85<sup>th</sup> percentile speeds in the area exceed the posted speed limit by at least 12 mph, which is the speeding threshold before an automated citations are issued. Thus, additional speed management measures are not warranted by MCDOT.

Table 4: Severe and Fatal Crash Summary

Crash Severity	Crash Date	Crash Location	Collision Type	Crash Mode
Fatal	5/28/2020	Intersection	Straight Movement Angle	Motor Vehicle

Table 5: Speed Data Summary

Roadway	Approach	Posted Speed Limit	Day 1 (10/8/24)			Day 2 (10/9/24)		
			50 <sup>th</sup> %	85 <sup>th</sup> %	Pace	50 <sup>th</sup> %	85 <sup>th</sup> %	Pace
Burdette Road 200 ft north of Burdette Court	NB	25 mph	24 mph	29 mph	22 - 31 mph	24 mph	29 mph	22 - 31 mph
	SB		26 mph	30 mph	23 - 32 mph	25 mph	30 mph	22 - 31 mph
River Road between I-495 ramps and Burdette Road	EB	35 mph	33 mph	41 mph	33 - 42 mph	31 mph	41 mph	32 - 41 mph
	WB		34 mph	41 mph	31 - 40 mph	34 mph	41 mph	30 - 39 mph
River Road between Royal Dominion drive & Beech Tree Rd	EB	35 mph	32 mph	38 mph	30 - 39 mph	32 mph	38 mph	29 - 38 mph
	WB		30 mph	38 mph	31 - 40 mph	28 mph	37 mph	30 - 39 mph



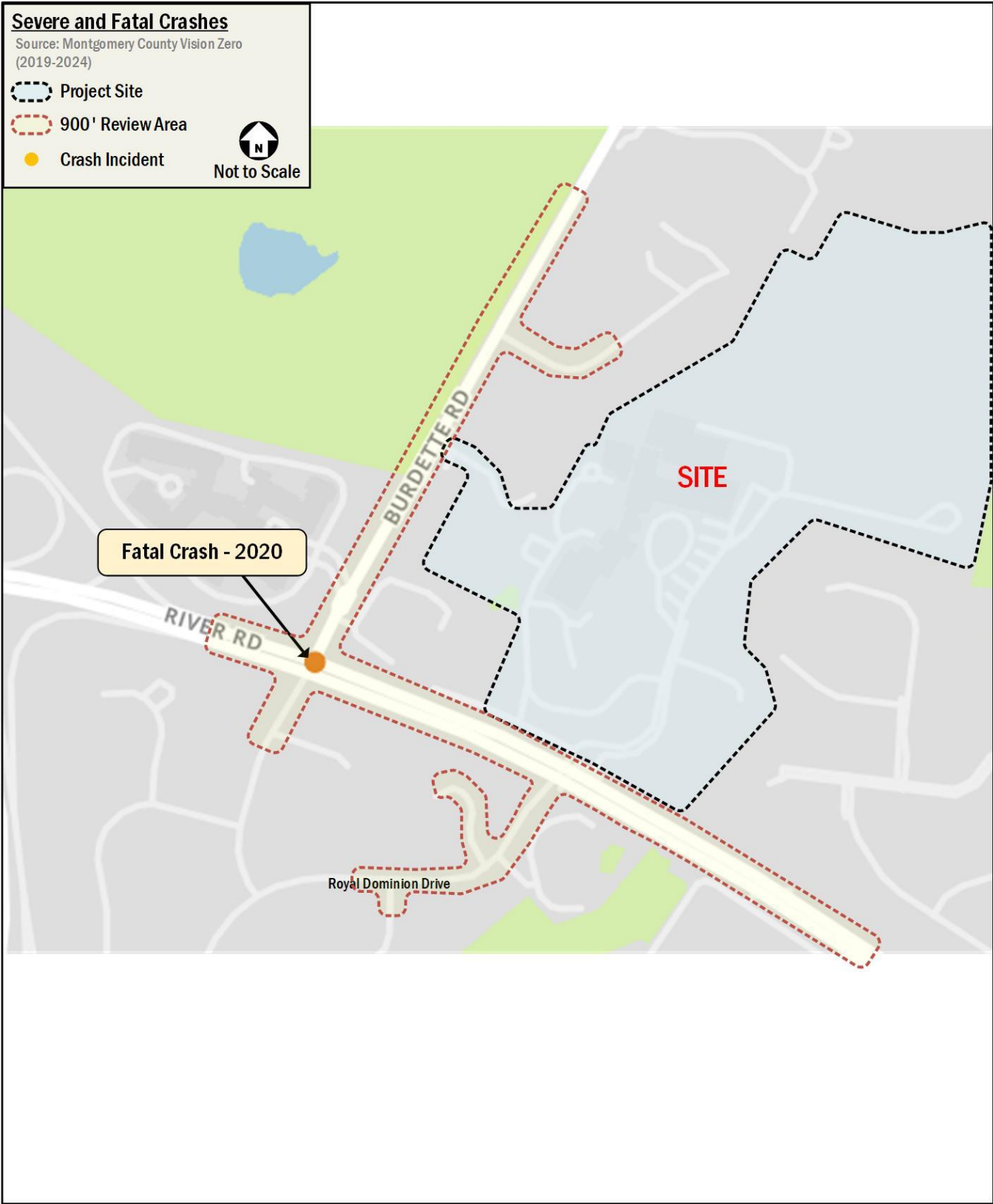


Figure 4: Severe and Fatal Crash Data Near Project Site

## Section 3: Traffic Operations

This section provides a summary of an analysis of the existing and future roadway capacity in the study area. Included is an analysis of potential vehicular impacts of the Holton-Arms School expansion project and a discussion of potential improvements as needed.

The purpose of the capacity analysis is to:

- Determine the existing capacity of the study area roadways;
- Determine the overall impact of the project on the study area roadways; and
- Discuss potential improvements and mitigation measures to accommodate the additional vehicular trips, if necessary.

The capacity analysis focuses on the school year/typical weekday morning and afternoon peak hours based on the existing traffic volumes in the study area. The traffic counts show the School's PM peak hour takes place from 3:30-4:30 PM while the Roadway PM peak hour occurs at 3:15-4:15 PM. As the roadway PM Peak hour and the School's dismissal peak hour are only off by 15-minutes, the School PM Peak Hour trip generation rates (3:30-4:30 PM) were analyzed with the roadway's PM Peak Hour volumes at 3:15-4:15 PM for a more conservative analysis.

To evaluate the additional trips generated by the proposed Summer Camp enrollment during the afternoon, a Summer PM analysis is also included using school year roadway volumes collected in January 2024 and October 2024 during the hours of Summer Camp dismissal (2:30-3:30 PM).

The following conclusions are reached within this chapter:

- The study area intersections operate well below the congestion thresholds per LATR guidelines during all analysis scenarios for the AM, PM, and Summer PM peak hours.
- Significant queueing is observed along the River Road (MD-190) corridor under Existing, Background, and Total Future conditions. Mitigation measures are recommended to improve queueing along the corridor.

- Changes to intersection geometry and phasing at Riverdale Road (MD-190) & Royal Dominion Drive, along with changes to signal timings throughout the corridor, significantly improve queueing along the corridor.

### **Study Area, Scope, & Methodology**

This section outlines the vehicular trips generated in the study area along the vehicular access routes and defines the analysis assumptions.

The scope of the analysis contained within this report was discussed with and agreed to by M-NCPPC as detailed in the approved scoping form. The scoping form document is included in the Technical Attachments. The general methodology of the analysis follows national and Montgomery County/LATR guidelines on the preparation of transportation impact evaluations of site development, unless stated otherwise.

### **Capacity Analysis Scenarios**

The vehicular analyses are performed to determine if the proposed development will lead to adverse impacts on traffic operations. This is accomplished by comparing future scenarios: (1) without the proposed development (referred to as the Background condition) and (2) with the proposed development (referred to as the Future condition).

Specifically, the roadway capacity analysis examined the following scenarios:

- Existing Conditions
- Future Conditions without the development (Background)
- Future Conditions with the development (Total Future)
  - Future Conditions with the development and mitigation measures that include:
    - changes to lane configuration and phasing at the intersection of River Road (MD-190) & Royal Dominion Drive
    - Minor adjustments to signal timings and offset optimization along the River Road corridor.

### **Study Area**

The study area of the analysis is a set of intersections where detailed capacity analyses are performed for the scenarios listed above. The set of intersections decided upon during the study scoping process with M-NCPPC Staff are those intersections

most likely to have potential impacts or require changes to traffic operations to accommodate the proposed development.

The number of study intersections analyzed in this report meet the LATR criteria and are based on the maximum number of new weekday peak-hour vehicle trips generated by the proposed project. For the Holton-Arms School expansion, a minimum of two (2) intersections in each direction were required.

Based on the projected future trip generation and the location of the site access points, as well as staff recommendation, the following intersections were analyzed:

1. River Road (MD-190) & SB I-495 (Outer Loop) Off-Ramp
2. Westbound River Road (MD-190) & Signalized Left Turn onto NB I-495 (Inner Loop) On-Ramp
3. River Road (MD-190) & Burdette Road
4. River Road (MD-190) & Royal Dominion Drive
5. River Road (MD-190) & Beech Tree Road/Nevis Road
6. River Road (MD-190) & Wilson Lane (MD-188)
7. Burdette Road & Arrowood Road/Hillmead Road

Figure 5 shows a map of the study area intersections.

For the purposes of the queueing analysis, discussed in more detail after the intersection capacity analysis results, the model used in the Synchro and SimTraffic software also included the River Road (MD-190) & Seven Locks Road and the River Road (MD-190) & Braeburn Parkway intersections. These non-study intersections were included to reflect accurate arrival patterns into the study area network based on the traffic signal timing and offset settings provided by MCDOT. **These two intersections are not study intersections and conditions were not analyzed at these locations.** In addition, turning movement data was not collected at River Road (MD-190) & Seven Locks Road or River Road (MD-190) & Braeburn Parkway and the movements that enter the network these locations are based on the traffic volumes collected at the River Road (MD-190) & SB I-495 (Outer Loop) Off-Ramp intersection and the River Road (MD-190) & Wilson Lane (MD-188) intersection.

### Traffic Volume Assumptions

The following section reviews the traffic volume assumptions and methodologies used in the roadway capacity analyses.

### Existing Traffic Volumes

The traffic volumes were collected on Tuesday, January 30<sup>th</sup>, 2024 at the following study intersections:

- River Road (MD-190) & Burdette Road
- River Road (MD-190) & Royal Dominion Drive
- River Road (MD-190) & Beech Tree Road/Nevis Road

The remaining study intersections were added during the scoping process and count data was collected on Wednesday, October 9<sup>th</sup>, 2024 at the following locations:

- Westbound River Road (MD-190) & Signalized Left-Turn onto NB I-495 (Inner Loop) On-Ramp
- River Road (MD-190) & SB I-495 (Outer Loop) Off-Ramp
- River Road (MD-190) & Wilson Lane (MD-188)
- Burdette Road & Arrowood Road/Hillmead Road

For school year analysis, the morning peak hour is 7:15 – 8:15 AM and the afternoon peak hour is 3:15 – 4:15 PM. Summer camp analysis is based on the summer camp trip generation (derived from count data collected in the June and July 2024) and the corresponding school year roadway volumes collected in January and October 2024 at 2:30 – 3:30 PM. Traffic volume data can be found in the Technical Attachments.

The existing peak hour traffic volumes are presented in Figure 6.

### Background Traffic Volumes (without the project)

Traffic projections for the background conditions typically consist of the existing volumes with the addition of traffic generated by approved but unbuilt developments in the study area (known as background developments).

Two (2) background developments contributing to the growth within the study area were identified: Westwood Shopping Center (preliminary plan number 120170170) and Washington Episcopal Day School (preliminary plan number 120150160).

The Westwood Shopping Center background volumes were derived from the “Phase II” trip generation in the approved 2018 LATR for that development and the corresponding trip distribution for the residential and retail trips presented in the study. It should be noted that a subsequent preliminary plan amendment was approved to replace the unbuilt multifamily component with senior living, the trip generation of the amendment was found to be lower than the approved trip generation; however, the development reserved the trips to potentially apply these to future phases, as such the approved trip generation was used in this analysis.

The Washington Episcopal Day School traffic volumes included in this analysis are based on the “additional” or net trips for additional enrollment and the senior living trips analyzed in the

approved 2015 Traffic Impact Study (TIS) for that project. The school trips distribution presented in the study was used for the school trips and the residential trip distribution percentages from the Westwood Shopping Center were applied to the senior living trips.

A map of developments is shown in Figure 7. The total background development peak hour volumes added to the analysis are shown in Figure 8.

The summer enrollment when counts were collected was below the existing enrollment cap (670 students), so trips were added to the Summer PM scenario to bring it up to the enrollment cap, under Background Conditions as these trips are approved in the network. The volumes added are shown in Figure 9.

Trips generated by background development and trips used to bring the summer up to its peak enrollment were assigned at the study intersections using the global trip distribution assumptions summarized in Table 6.

Table 6: Trip Distribution

To/From	Percentage	
	AM	PM
Inbound		
River Road to the west	63%	52%
River Road to the east	34%	35%
Royal Dominion Drive to the south	3%	4%
Outbound		
River Road to the west	53%	61%
River Road to the east	41%	38%
Royal Dominion Drive to the south	6%	1%

Trip distribution assumptions and routing for the additional school trips are provided in Figure 10 for inbound routing and Figure 11 for outbound routing. Trip distribution for the project was determined based on: existing travel patterns in the study area and the direction of travel for school trips based on the site driveway counts.

The traffic volumes for the Background conditions are shown in Figure 12.

Total Future Traffic Volumes (with the project)

The Total Future traffic volumes consist of the Background volumes and the addition of the traffic volumes generated by the proposed project (site-generated trips). Thus, the Total Future traffic volumes include the existing roadway volumes, background development volumes, net trips to account for the difference in approved enrollment trip and enrollment during data

collection (for the Summer PM period only), and the net new trips generated by the proposed enrollment increase.

The site-generated trips summarized in Table 1 were then applied to the study area roadway network based on the trip distributions discussed for school trips. The resulting site-generated traffic volumes during peak hours are shown in Figure 13. The Total Future traffic volumes are shown in Figure 14.

Geometry and Operations Assumptions

The following section reviews the roadway geometry and operations assumptions made and the methodologies used in the roadway capacity analyses.

Existing Geometry and Operations Assumptions

The geometry and operations assumed in the existing conditions scenario are those present when the main data collection occurred. Gorove Slade made observations and confirmed the existing lane configurations and traffic controls at the intersections within the study area. Existing signal timings and offsets were obtained from Montgomery County and confirmed during field reconnaissance. The signal timing data provided by MCDOT is included in the Technical Attachments.

The lane configurations and traffic controls for the Existing conditions are shown on Figure 15.

Background Geometry and Operations Assumptions

Following national and Montgomery County/LATR methodologies, a background improvement must meet the following criteria to be incorporated into the analysis:

- Be funded; and
- Have a construction completion date prior or close to the proposed development.

Based on these criteria, there are no funded projects which will affect the geometry of the study intersections and therefore the lane configurations and traffic controls in the Background Conditions are consistent with the lane configurations and traffic controls for the Existing Conditions.

Total Future Geometry and Operations Assumptions

As part of the project, changes to the intersection geometry at the intersection of River Road (MD-190) and Royal Dominion Drive were analyzed and the recommendations are as follows:

- Extending the Westbound right-turn lane from 210' to 500'

- This improvement was analyzed as a mitigation strategy and was not found to be effective in reducing queues due to westbound thru queues consistently blocking vehicles from entering the right-turn lane. Therefore, this mitigation improvement is not recommended.
- As part of the mitigation analysis, increasingly longer turn lane lengths were tested and were found to be ineffective in reducing queues.
- An extension the westbound right-turn lane at this location would impact the on-street bicycle lane along westbound River Road.
- Recommended restriping the southbound approach lane use (site driveway) from the existing lane use of right-turn lane, shared left-thru lane, and a left-turn lane to a recommended lane use of a right-turn lane, shared right-thru lane, and a left-turn lane.
- Recommended restriping the northbound approach lane use from an existing shared left-thru-right lane to a recommended lane use of a shared left-thru lane and right-turn lane.
- The recommended lane use changes are also intended to accommodate concurrent north-south phasing to allow for more green time along River Road.

Along with geometry changes, changes to signal timings are recommended throughout the network to improve progression and better distribute queuing along the River Road corridor.

The lane configurations and traffic controls for the Mitigated Total Future condition are shown in Figure 16.

## ***Vehicular Analysis Results***

### **Capacity Analysis**

Corridor and intersection capacity analyses were performed for the four (4) scenarios outlined previously at the study intersections shown in Figure 5 for the AM peak hour, PM peak hour, and Summer PM peak hour.

The site is located in the Bethesda/Chevy Chase policy area, an Orange policy area. Per LATR guidelines, "For intersections located within Orange Policy areas, the Highway Capacity Manual operations (delay-based) level of service standard applies to all study intersections." Therefore, delay-based analysis was conducted using Synchro software for corridor delays. The HCM 2010 methodology was used at the isolated unsignalized study intersection that is not located along the River

Road corridor. Under Montgomery County and LATR guidelines, the congestion standards set for the site Policy Area include a congestion standard of 80 seconds/vehicle.

**All study intersections are located consecutively along the River Road corridor, with the exception of Burdette Road & Arrowood Road/Hillmead Road intersection. Therefore, the corridor was analyzed to determine adequacy, consistent with the LATR guidelines for corridor scenarios, as excerpted below. Per page 33 LATR guidelines:**

***"If a network of multiple intersections is analyzed, the vehicular delay threshold applies to the network as a whole, not to individual intersections within the network. The focus on average delay is intended to facilitate a focus on management and operations strategies; as the county builds out its roadway network, the emphasis is less on constructing additional automobile capacity and more on finding more efficient means for operating the current network to accommodate changing travel demands through techniques such as signal timing, signing and marking, and vehicle progression."***

For reference purposes, the intersections were also analyzed using the Critical Lane Volume (CLV) methodology. CLV results are provided in the Technical Attachments.

**As shown in Table 7 and Table 8, the River Road corridor and the single isolated intersection operate well within the congestion standards under all scenarios. Therefore, the proposed increase in enrollment would not trigger a requirement for intersection capacity improvements, thus satisfying the Motor Vehicle Adequacy Test.**

### ***Queuing Analysis***

While the analyses indicate the LATR Motor Vehicle Test is passed without the need for improvements, operations were further analyzed at the request of SHA to review queues along the corridor.

It is important to note that this corridor is a heavy commuter route for through traffic to and from the east on River Road, and the queuing deficiencies identified below are a result of that baseline commuter traffic flow. The proposed increase in enrollment does have some layered impact; however, the corridor capacity is not exceeded based on the policy area congestion standards, which recognize that higher levels of congestion are acceptable in Orange and Red policy areas.



The queuing analysis was performed at the study intersections using SimTraffic. The 50<sup>th</sup> and 95<sup>th</sup> Percentile queue lengths are shown for each lane group at each study intersection. The 50<sup>th</sup> (average) percentile queue is the maximum back of queue on a median cycle. The 95<sup>th</sup> percentile queue is the maximum back of queue that is exceeded five percent of the time.

Table 9 presents the 50<sup>th</sup> and 95<sup>th</sup> percentile for all study intersections. Note that in the queueing review below, "SYPM" refers to the School Year PM peak hour while "SSPM" refers to the Summer School PM Peak Hour. The detailed queuing analysis worksheets are provided in the Technical Attachments.

As Table 9 shows, queues exceed available storage length at four (4) intersections under existing conditions:

- River Road (MD-190) & Burdette Road
  - Eastbound Left (AM)
  - Eastbound Thru-Right (AM)
  - Westbound Left (SYPM/SSPM)
  - Westbound Thru (SSPM)
  - Westbound Right (SSPM)
- River Road (MD-190) & Royal Dominion Drive
  - Eastbound Left (AM)
  - Westbound Thru (SSPM)
  - Westbound Right (AM/SYPM/SSPM)
  - Southbound Right (SSPM)
- River Road (MD-190) & Beech Tree/Nevis Road
  - Northbound Left-Thru (AM/SYPM/SSPM)
  - Northbound Right (AM/SYPM)
- River Road (MD-190) & Wilson Lane
  - Eastbound Left (AM/SYPM)
  - Westbound Left (SSPM)
  - Westbound Right (SYPM)

Under Background Conditions, queues exceed storage capacity at the same movements during the same peak hours, with some movements experiencing queues that exceed storage capacity during an additional analysis period/additional peak hour. The westbound thru movement at River Road & Burdette Road and the westbound right movement at River Road & Wilson Lane improved during the Summer PM peak hour to within storage capacity, likely due to the variation inherent in SimTraffic.

Background Conditions cause spillover for four (4) additional movements. The following movements exceed the storage capacity under Background Conditions:

- River Road (MD-190) & Burdette Road
  - Eastbound Left (AM)
  - Eastbound Thru-Right (AM)
  - Westbound Left (SYPM/SSPM)

- Westbound Thru (SYPM)
- Westbound Right (SYPM/SSPM)
- River Road (MD-190) & Royal Dominion Drive
  - Eastbound Left (AM)
  - Westbound Thru (SYPM/SSPM)
  - Westbound Right (AM/SYPM/SSPM)
  - Southbound Right (SSPM)
- River Road (MD-190) & Beech Tree/Nevis Road
  - Westbound Left (SYPM)
  - Westbound Thru (SYPM)
  - Westbound Right (SYPM)
  - Northbound Left-Thru (AM/SYPM/SSPM)
  - Northbound Right (AM/SYPM)
- River Road (MD-190) & Wilson Lane
  - Eastbound Left (AM/SYPM/SSPM)
  - Westbound Left (SYPM/SSPM)
  - Westbound Thru (SYPM)
  - Westbound Right (SYPM)

The southbound right movement at River Road & Royal Dominion Drive and the Westbound Left at River Road & Royal Dominion Drive improved during the Summer PM peak hour to within storage capacity, likely due to the variation inherent in SimTraffic. With the addition of volumes generated by the proposed expansion, queues exceed available storage length at the following locations under future conditions:

- River Road (MD-190) & Burdette Road
  - Eastbound Left (AM)
  - Eastbound Thru-Right (AM)
  - Westbound Left (SYPM/SSPM)
  - Westbound Thru (SYPM/SSPM)
  - Westbound Right (SYPM/SSPM)
- River Road (MD-190) & Royal Dominion Drive
  - Eastbound Left (AM)
  - Eastbound Thru (AM)
  - Westbound Left (AM)
  - Westbound Thru (SYPM/SSPM)
  - Westbound Right (AM/SYPM/SSPM)
  - Southbound Right (SYPM)
- River Road (MD-190) & Beech Tree/Nevis Road
  - Westbound Left (SYPM/SSPM)
  - Westbound Thru (SYPM)
  - Westbound Right (SYPM)
  - Northbound Left-Thru (AM/SYPM/SSPM)
  - Northbound Right (AM/SYPM)
- River Road (MD-190) & Wilson Lane
  - Eastbound Left (AM/SYPM/SSPM)
  - Westbound Left (SYPM)
  - Westbound Thru (SYPM)
  - Westbound Right (SYPM)

The Total Future with Mitigation scenario includes recommended changes to intersection geometry and phasing at River Road

(MD-190) & Royal Dominion Drive, in addition to changes to signal timings and offsets along the River Road corridor. Under the Total Future with Mitigation scenario queues at several approaches exceed those in the Background scenario, however, these queues are expected along a corridor with high commuter volumes. Where queues increase, the increases are largely consistent with Background conditions and increases do not exceed 125 feet or five (5) car lengths. The recommended mitigation strategies significantly improve progression of vehicles traveling along the River Road corridor and afternoon operations are observed to experience shorter corridor delays with significantly reduced queues observed on the east end of the study area.

Under the Total Future with Mitigation conditions, the following movements exceed the storage capacity under the Total Future with Mitigation conditions:

- **River Road (MD-190) & Burdette Road**
  - Eastbound Left (AM/SYPM/SSPM)
    - No site traffic added to this movement
  - Eastbound Shared Thru-Right Curbside Lane (AM)
    - These queues result from the lane dropping immediately downstream of the intersection.
    - Exceeds under background conditions in the AM
  - Westbound Left (SYPM/SSPM)
    - Queues for this movement are a direct result of westbound thru queues blocking access to the westbound left turn lane. The left turn storage is adequate to contain these vehicles were it not blocked by the thru queue.
    - No site traffic added to this movement
  - Westbound Thru (SYPM/SSPM)
    - This queue is primarily impacted by the number of vehicles merging on to the right lanes just downstream of this intersection to access the I-495 ramps.
  - Westbound Right (SYPM/SSPM)
    - Queues for this movement are a direct result of westbound thru queues blocking access to the westbound right turn lane. The right turn storage is adequate to contain these vehicles were it not blocked by the thru queue.
    - No site traffic added to this movement
- **River Road (MD-190) & Royal Dominion Drive**
  - Eastbound Left (AM)
    - Total future mitigated simulations show an increase of 34 ft (less than 2 car lengths) and field observations indicate this queue clears quickly
  - Westbound Thru (SYPM)

- Queues at this intersection are a direct result of westbound queues spilling over from the Burdette Road intersection.
- Westbound Right (SYPM)
  - Queues for this movement are a direct result of westbound thru queues blocking access to the westbound right turn lane. The right turn storage is adequate to contain these vehicles were they not blocked by the thru queue.
  - Longer turn lane lengths were tested and found to have no impact on reducing queues.
- **River Road (MD-190) & Beech Tree/Nevis Road**
  - Westbound Left (SYPM)
    - Queues for this movement are a direct result of westbound thru queues blocking access to the westbound left turn lane. The left turn storage is adequate to contain these vehicles were they not blocked by the thru queue.
    - No site traffic added to this movement
  - Westbound Thru (SYPM)
    - Queues at this movement decrease significantly from the background scenario (493 ft) as a result of recommended corridor offset and timing adjustments in addition to the phasing changes at River Road & Royal Dominion Drive
  - Northbound Left-Thru (AM/SYPM/SSPM)
    - No site traffic added to this movement
    - Exceeds under background conditions in the AM, SYPM, and SSPM
  - Northbound Right (AM/SYPM)
    - No site traffic added to this movement
    - Exceeds under background conditions in the AM and SYPM
- **River Road (MD-190) & Wilson Lane**
  - Eastbound Left (AM/SYPM/SSPM)
    - Exceeds under background conditions in the AM, SYPM, and SSPM
    - Total future mitigated simulations show improvements in the AM, SYPM, and SSPM
    - Improvements at this intersection are a result of timing and phasing changes at River Road & Royal Dominion Drive.

The recommended mitigation measures significantly reduce queues in the peak direction of commuter traffic flow (westbound) along River Road (MD-190) in the afternoon period. **While it is noted that through queues increase and decrease at some locations, the simulations show that progression along the corridor would overall improve with this redistribution of queuing so that no one intersection is significantly overloaded, as is the case with conditions with or without the increased enrollment.**

## Mitigation Measures

While the increased enrollment does not trigger LATR thresholds for intersection capacity improvements, we have identified potential improvements that could be implemented to improve progression and better distribute queuing along the River Road corridor.

The recommended mitigations to address queueing include adjustments to signal timings along the River Road (MD-190) Corridor as well as changes to the intersection geometry at Riverdale Road (MD-190) & Royal Dominion Drive.

Recommended changes to intersection geometry are as follows:

- Restriping the southbound approach lane use (site driveway) from the existing lane use of right-turn lane, shared left-thru lane, and a left-turn lane to a recommended lane use of a right-turn lane, shared right-thru lane, and a left-turn lane.
- Restriping the northbound approach lane use from an existing shared left-thru-right lane to a recommended lane use of a shared left-thru lane and right-turn lane.
- The recommended lane use changes are also intended to accommodate concurrent north-south phasing, which would then allow for more green time to allocated to the River Road corridor.

The recommended lane use changes are shown in Figure 16.

Table 7: River Road Corridor Delay Results\*

Direction/Total	Existing						Background						Total Future						Total Future (Mitigation)					
	AM School Peak		PM Peak		Summer PM Peak		AM School Peak		PM Peak		Summer PM Peak		AM School Peak		PM Peak		Summer PM Peak		AM School Peak		PM Peak		Summer PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Eastbound:	19.0	B	16.0	B	20.0	B	21.0	C	16.0	B	20.0	B	28.0	C	18.0	B	19.0	B	22.0	C	18.0	B	20.0	B
Westbound:	27.0	C	30.0	C	38.0	D	29.0	C	31.0	C	39.0	D	43.0	D	42.0	D	39.0	D	30.0	C	19.0	B	20.0	B
Corridor:	22.0	C	24.0	C	30.0	C	24.0	C	24.0	C	30.0	C	34.0	C	31.0	C	30.0	C	25.0	C	19.0	B	20.0	B

\* Total corridor delays (Control Delay + Queue Delay)

Table 8: Isolated Intersection HCM Delays

Intersection	Existing						Background (Approved)						Total Future						Total Future (Mitigation)					
	AM School Peak		PM Peak		Summer PM Peak		AM School Peak		PM Peak		Summer PM Peak		AM School Peak		PM Peak		Summer PM Peak		AM School Peak		PM Peak		Summer PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
7. Burdette Road & Arrowwood Road/Hillmead Road	7.9	A	8.1	A	8.1	A	7.9	A	8.1	A	8.1	A	7.9	A	8.1	A	8.1	A	7.9	A	8.1	A	8.1	A

Table 9: Queueing Analysis Results

Intersection and Lane Group	Storage Length (ft)	Existing						Background (Approved)						Total Future						Total Future (Mitigation)					
		AM School Peak		PM Peak		Summer PM Peak		AM School Peak		PM Peak		Summer PM Peak		AM School Peak		PM Peak		Summer PM Peak		AM School Peak		PM Peak		Summer PM Peak	
		50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
1. I-495 SB Ramps & River Road																									
Eastbound Thru	855	89	176	35	101	57	148	89	189	45	124	54	131	91	188	45	112	54	136	109	207	41	99	34	93
Westbound Thru	885	79	168	48	132	57	144	79	163	58	146	56	137	83	177	53	138	57	142	118	169	47	135	47	134
Northbound Left	210	115	176	102	165	103	169	116	176	96	160	105	171	113	175	91	153	103	169	111	181	100	161	99	153
2. I-495 NB Ramps & River Road																									
Eastbound Left	670	234	348	237	357	250	370	231	364	238	350	247	361	247	365	239	353	250	364	248	357	241	369	247	371
Eastbound Thru	920	43	229	-	-	208	-	44	229	121	233	-	-	86	329	130	264	120	-	66	284	6	73	136	272
Westbound Thru	775	176	341	171	332	-	390	176	331	200	358	197	363	181	343	207	376	206	375	186	345	198	362	218	393
3. Burdette Road & River Road																									
Eastbound Left	175	102	263	47	107	83	148	97	252	81	151	79	150	107	272	79	6	75	140	91	240	167	276	122	224
Eastbound Thru	1,750	339	668	62	133	81	175	317	636	78	152	64	153	378	712	81	164	80	160	358	688	172	476	88	266
Eastbound Thru Right	400	324	641	62	126	80	163	307	613	77	156	72	154	354	667	84	165	73	146	337	640	85	251	62	181
Westbound Left	195	4	18	70	256	67	250	5	44	106	316	63	242	6	52	111	323	94	298	2	12	132	347	72	261
Westbound Thru	870	92	260	264	486	548	944	106	286	788	1007	455	849	135	327	780	985	590	896	174	378	816	1035	524	925
Westbound Right	270	8	34	35	188	88	328	6	27	192	469	88	328	7	28	173	452	90	337	23	129	185	462	88	328
Northbound LTR	820	40	86	14	43	25	64	41	92	30	71	27	65	43	97	24	59	28	65	38	88	23	55	28	65
Southbound Left Thru	200	90	160	58	131	46	98	90	161	52	112	42	97	91	180	50	109	41	91	77	149	53	112	49	102
Southbound Right	200	45	88	47	96	51	106	45	84	37	75	56	115	49	94	47	104	45	96	45	83	51	113	50	98
4. Royal Dominion Drive & River Road																									
Eastbound Left	500	248	539	75	140	105	180	268	573	81	183	103	177	354	650	110	230	128	205	323	607	110	223	150	260
Eastbound Thru	865	377	755	114	245	148	307	419	852	134	257	154	297	482	943	157	293	168	314	409	846	75	199	86	212
Eastbound Right	240	42	204	2	12	10	71	42	204	2	12	9	55	34	177	7	69	5	20	32	163	2	12	8	54
Westbound Left	235	59	186	8	27	47	194	73	227	48	219	43	175	82	255	31	167	38	171	66	207	30	166	39	153
Westbound Thru	1,935	470	1182	341	585	990	2116	438	964	1794	2399	1022	2155	806	1771	1721	2507	1259	2367	463	992	1207	2417	574	1381
Westbound Right	210	131	338	65	247	141	352	133	337	118	345	110	317	177	370	140	363	138	349	-	-	-	-	-	-
Westbound Right	500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	174	524	282	745	165	551
Northbound LTR	350	91	175	53	100	75	137	100	186	55	111	78	144	103	185	55	109	84	171	-	-	-	-	-	-
Northbound Left	150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32	72	47	117	42	90
Northbound Thru Right	350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90	182	36	90	41	91
Southbound Left	N/A	59	165	39	120	72	181	66	166	41	132	67	186	80	198	63	168	86	194	168	324	211	401	263	402
Southbound Left Thru	N/A	110	206	95	172	161	435	119	229	85	172	232	642	130	230	140	375	129	240	-	-	-	-	-	-
Southbound Thru Right	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	134	436	279	742	255	674
Southbound Right	N/A	73	184	119	210	140	356	81	191	139	254	170	417	105	248	184	359	159	299	81	247	174	413	126	334
5. Beech Tree/Nevis Road & River Road																									
Eastbound Left	300	15	42	13	36	31	68	10	31	13	41	36	105	10	33	23	98	32	74	26	141	16	47	35	84
Eastbound Thru	1,935	151	291	120	278	127	305	176	484	139	314	142	324	170	369	148	322	156	354	282	644	169	359	133	299
Eastbound Right	270	5	56	3	16	7	57	14	108	6	55	8	76	4	52	8	76	4	19	15	119	8	76	9	76
Westbound Left	250	36	125	44	80	52	193	30	104	149	387	61	214	26	94	127	355	76	261	35	113	89	264	46	133
Westbound Thru	1,780	207	368	78	213	346	1242	216	40	1154	2403	324	1061	265	590	1118	2412	597	1724	292	496	649	1910	155	452
Westbound Right	450	18	96	3	15	73	360	17	94	145	526	68	349	27	171	155	547	80	380	24	128	74	369	8	81
Northbound Left Thru	70	102	189	41	86	44	98	109	206	51	106	41	81	102	195	62	138	45	94	109	214	48	111	39	87
Northbound Right	70	72	143	36	75	27	63	71	142	37	74	28	57	73	150	39	88	26	60	74	145	39	82	28	60
Southbound Left Thru	1,060	77	150	107	181	103	183	76	138	109	205	99	171	95	172	99	180	105	183	82	151	101	189	96	176
Southbound Right	150	15	40	14	39	15	45	17	43	16	58	22	74	18	60	20	73	19	50	20	62	19	64	19	51

Intersection and Lane Group	Storage Length (ft)	Existing						Background (Approved)						Total Future						Total Future (Mitigation)					
		AM School Peak		PM Peak		Summer PM Peak		AM School Peak		PM Peak		Summer PM Peak		AM School Peak		PM Peak		Summer PM Peak		AM School Peak		PM Peak		Summer PM Peak	
		50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
6. Wilson Lane & River Road																									
Eastbound Left	330	238	358	222	356	284	385	260	369	276	395	269	383	265	381	263	375	270	382	249	358	261	392	253	379
Eastbound Thru	1780	353	737	290	514	383	658	583	1277	403	738	371	690	563	1230	364	644	378	662	500	1273	436	849	335	642
Eastbound Right	400	44	249	15	140	28	195	96	374	73	326	11	119	90	363	50	267	17	148	62	298	65	305	11	120
Westbound Left	270	76	192	77	199	107	275	85	216	138	345	110	279	88	200	136	343	99	268	93	227	100	269	89	231
Westbound Thru	1,585	273	407	550	883	651	1220	270	406	1110	1966	668	1230	279	438	1092	1964	704	1373	265	425	683	1404	527	907
Westbound Right	400	-	-	120	439	116	431	6	89	156	497	83	362	9	111	178	527	73	340	6	90	95	389	58	300
Northbound Left	260	37	83	109	186	83	155	37	88	101	175	83	146	39	89	97	191	82	152	40	93	98	176	94	178
Northbound Thru	1130	97	148	82	128	86	148	96	152	90	142	84	142	90	136	77	140	91	147	97	152	94	149	91	149
Northbound Right	300	3	38	-	-	-	-	4	43					16	91		-		-	11	84		-		-
Southbound Left	230	57	108	55	121	53	112	66	124	66	139	55	110	61	116	61	123	59	124	58	112	63	123	55	111
Southbound Thru	570	82	134	205	332	217	412	89	169	244	438	206	421	73	151	235	415	229	451	80	158	242	447	224	432
Southbound Right	300	14	89	144	235	134	248	25	122	143	247	126	247	29	133	143	245	154	234	31	135	143	248	135	250
7. Arrowood Road/Hillmead Road & Burdette Road																									
Eastbound Left/Right	1700	21	47	18	47	26	58	21	46	17	46	26	55	22	46	20	48	24	56	21	47	18	45	57	57
Westbound Left/Right	300	20	48	19	44	22	49	21	48	22	49	21	47	22	51	17	42	18	45	23	47	21	45	47	47
Northbound Left Thru	1055	31	60	37	73	42	73	32	62	45	82	40	75	31	60	43	71	40	75	31	57	47	82	80	80
Southbound Left Thru	1,480	33	56	33	54	39	69	33	54	30	50	35	61	33	56	33	56	37	65	31	51	31	54	69	69





Figure 5: Study Intersections



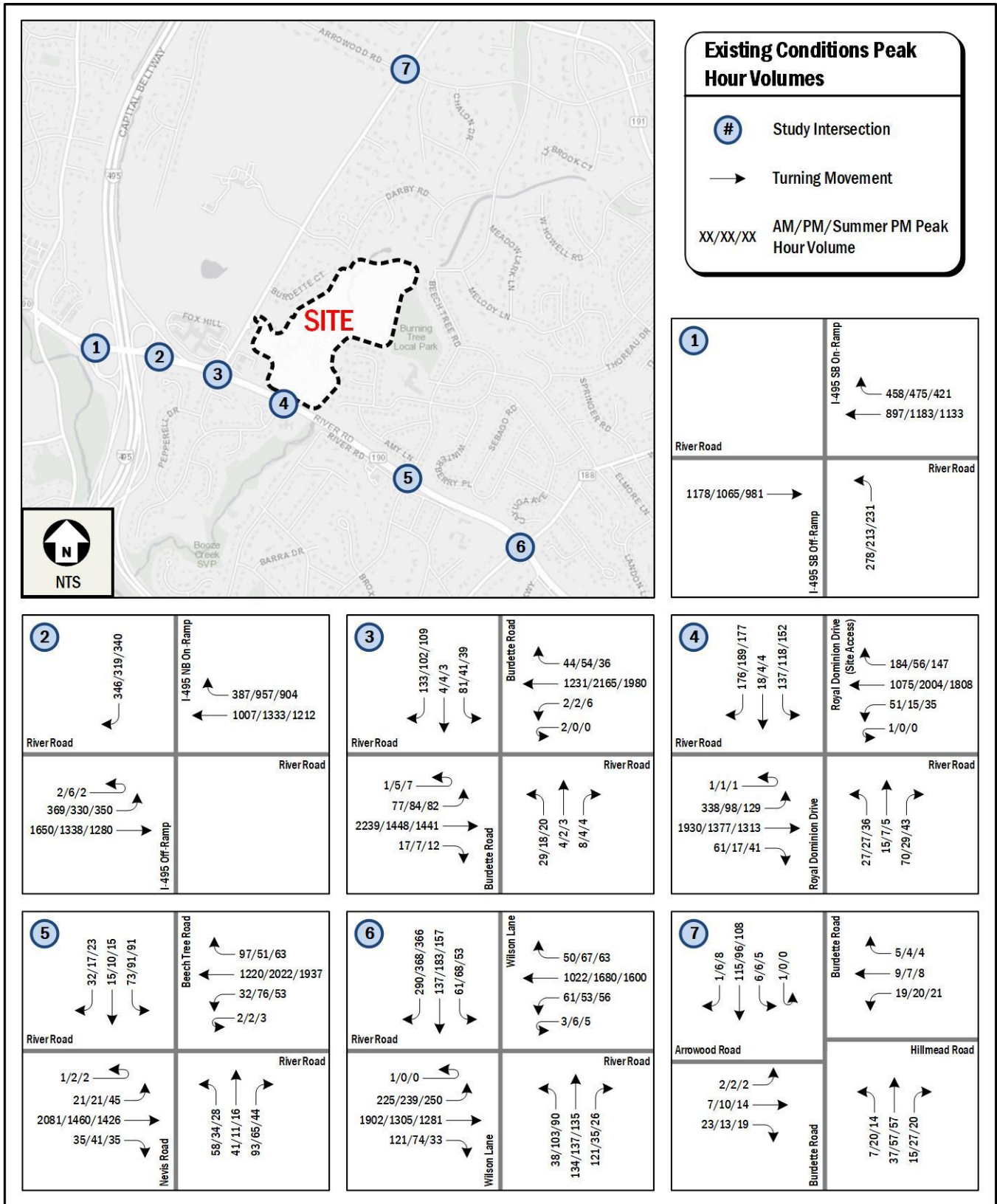


Figure 6: Existing Conditions Peak Hour Traffic Volumes

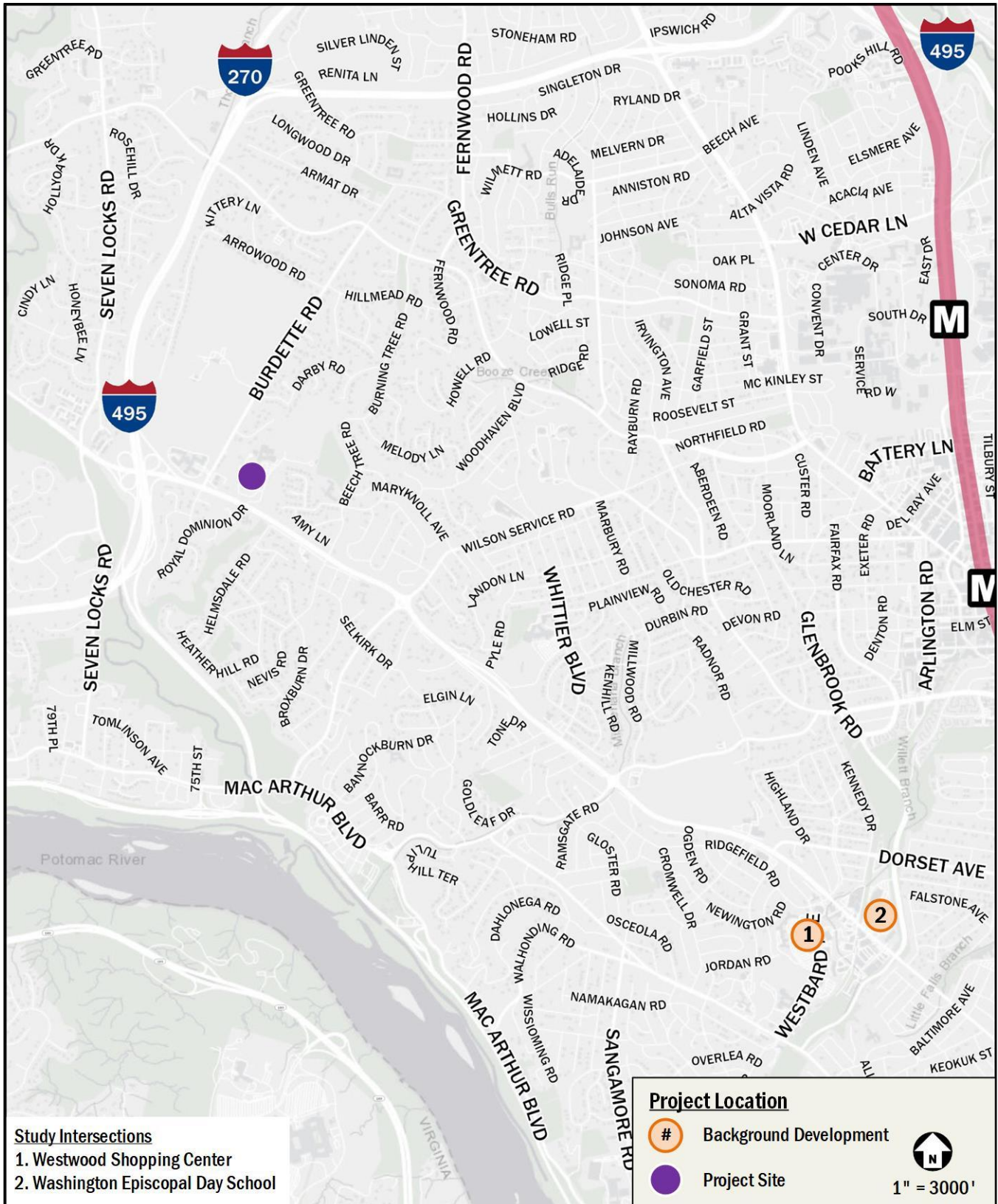
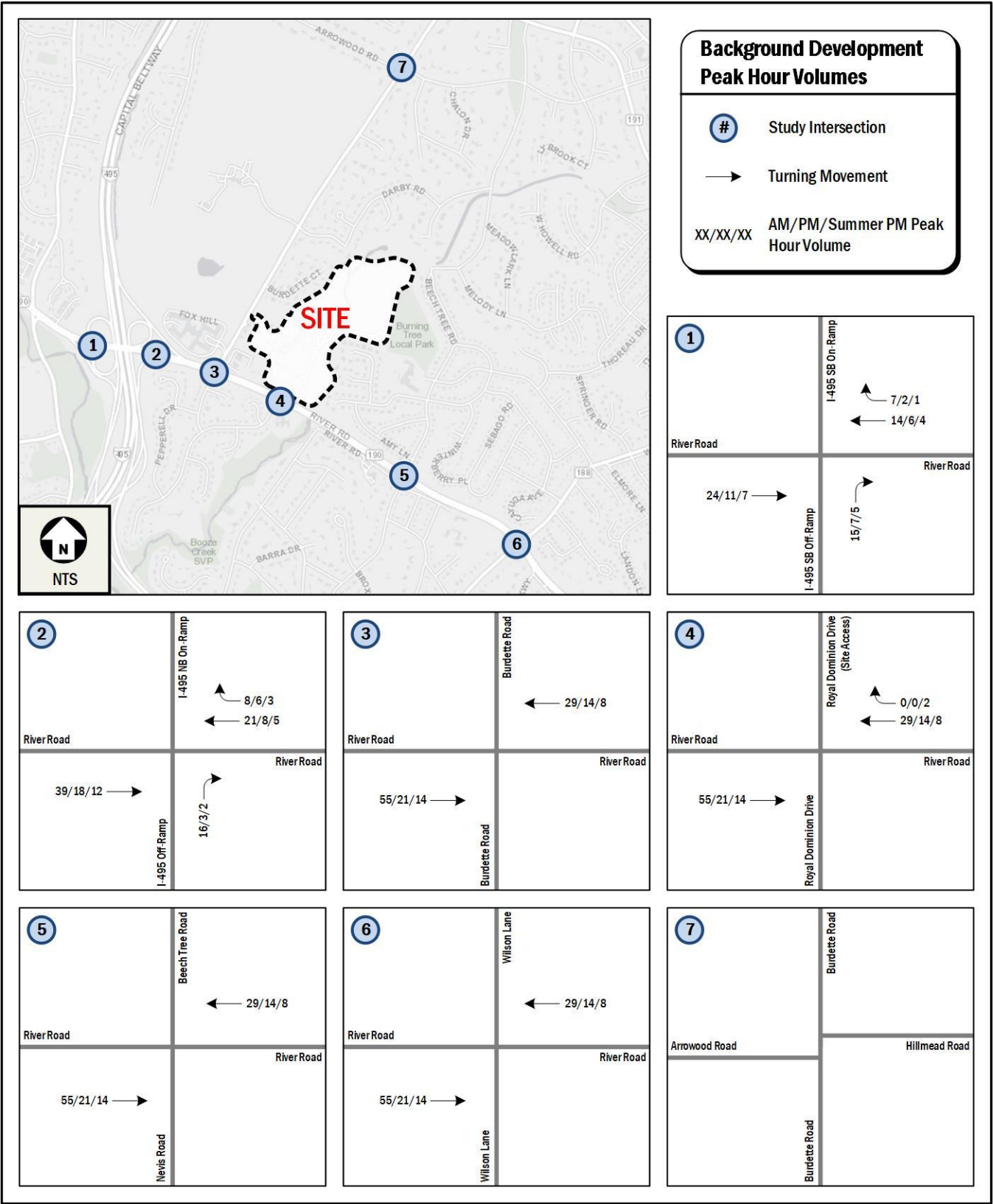


Figure 7: Background Developments





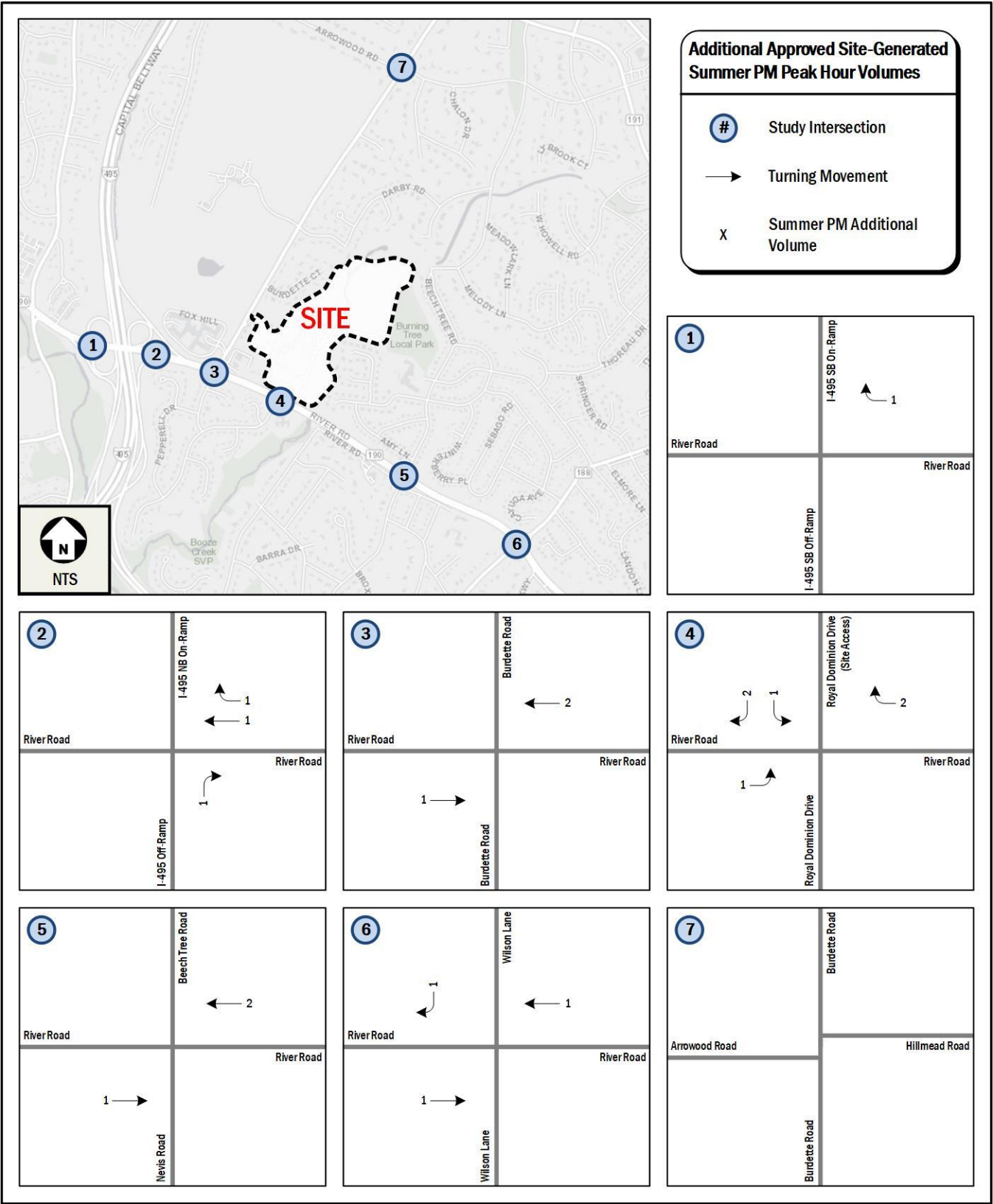


Figure 9: Additional Approved Site-Generated Summer PM Peak Hour Volumes



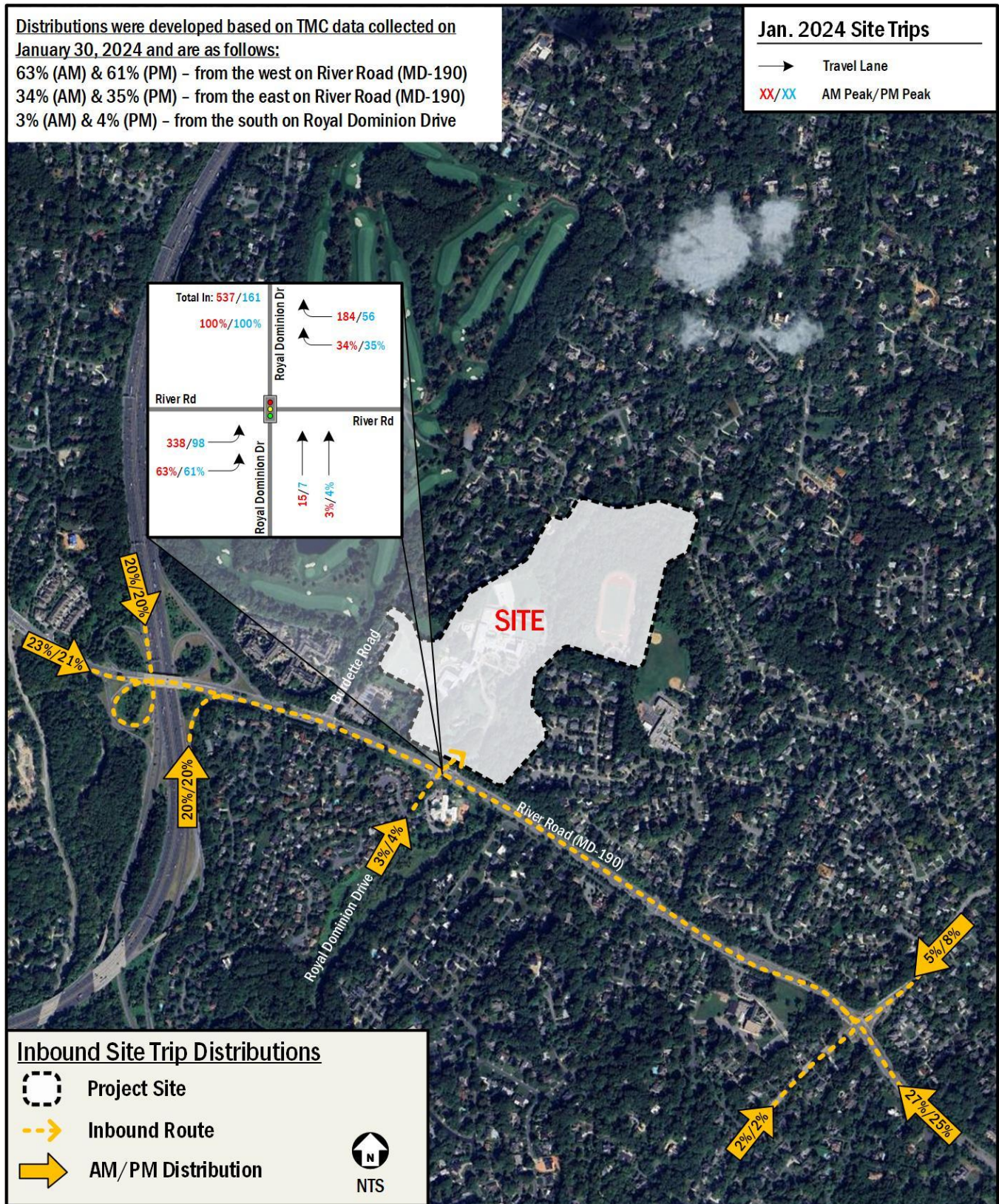


Figure 10: Inbound Trip Distribution



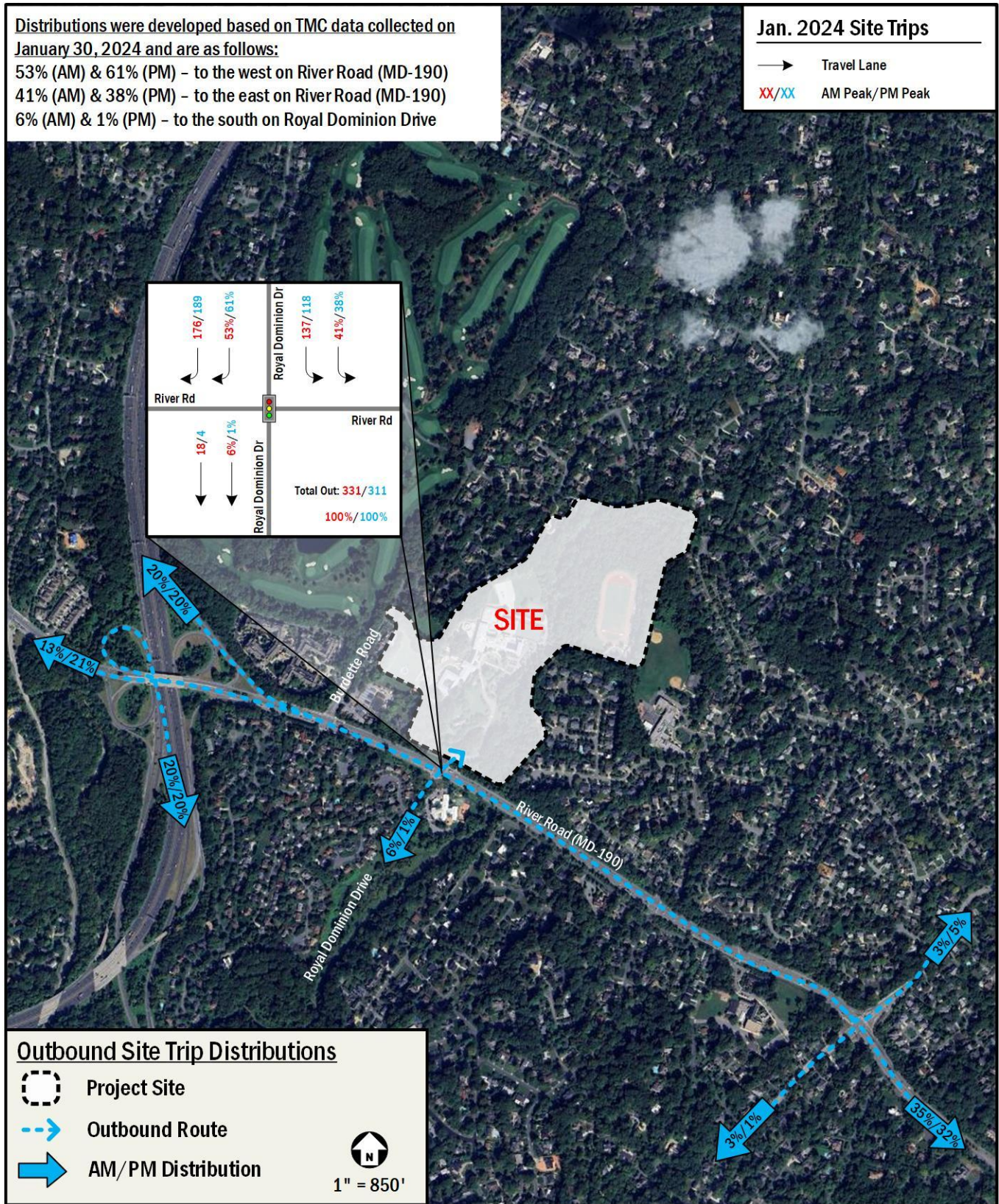


Figure 11: Outbound Trip Distribution



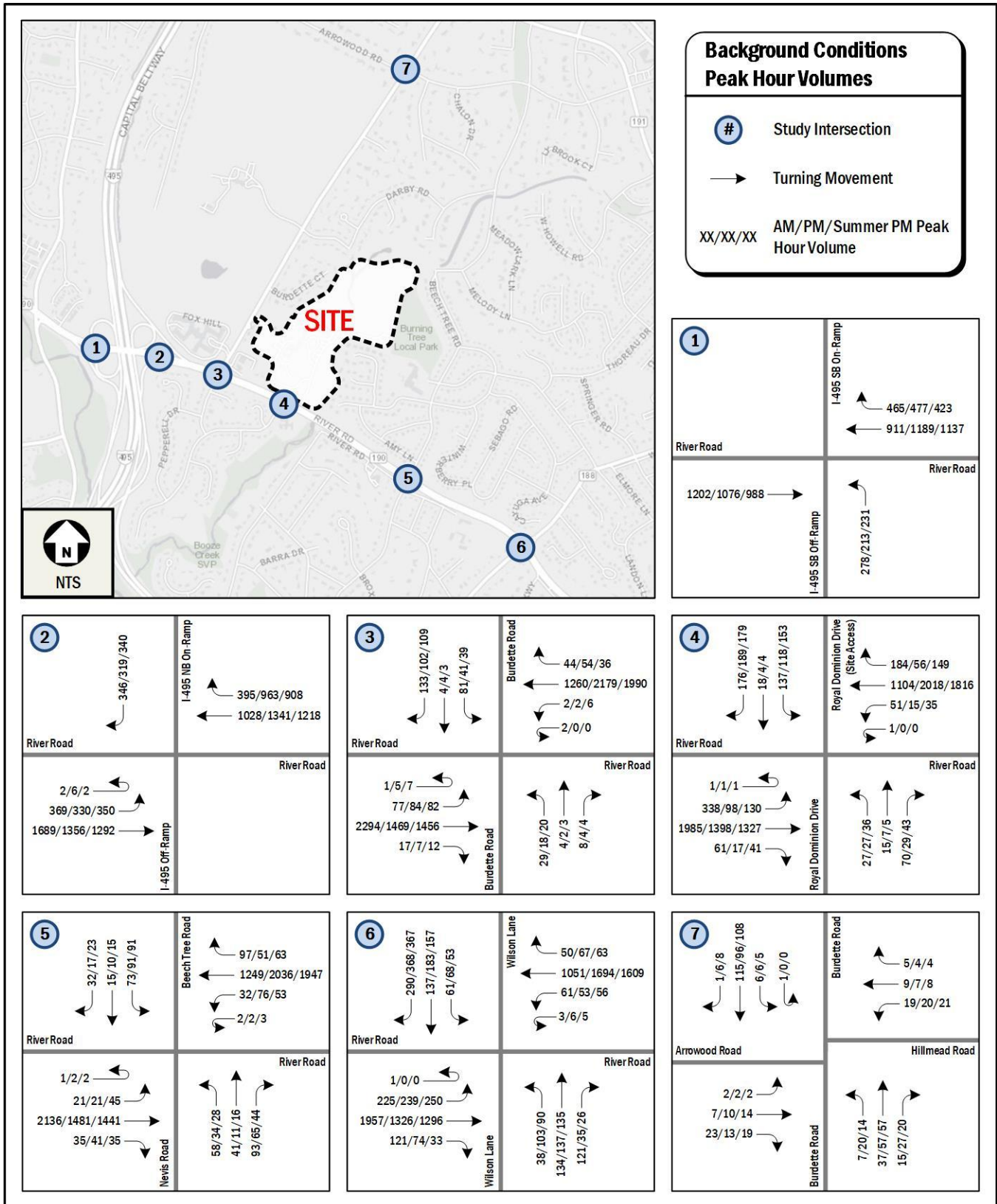


Figure 12: Background Conditions Peak Hour Volumes

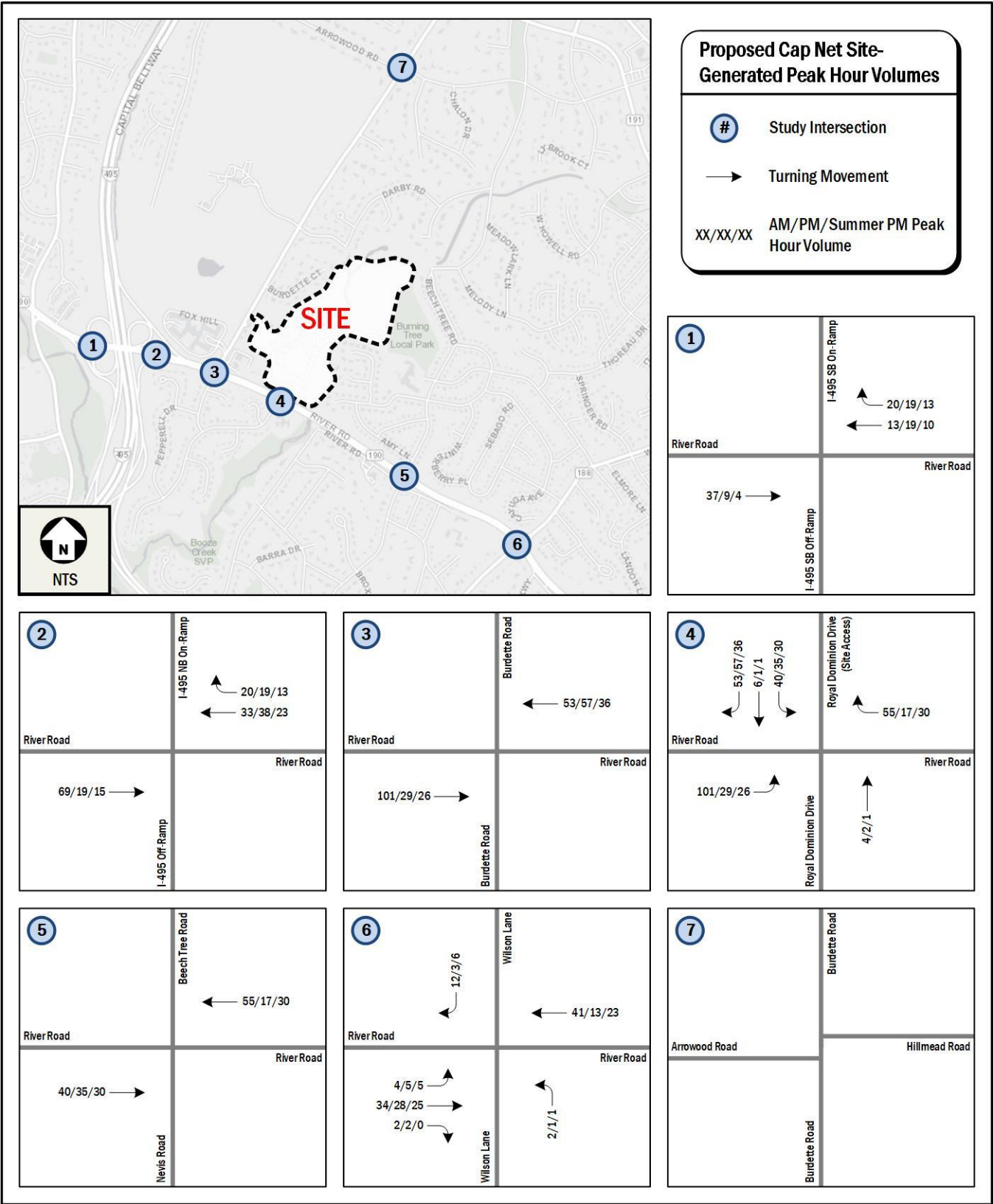


Figure 13: Proposed Net Site-Generated Peak Hour Volumes

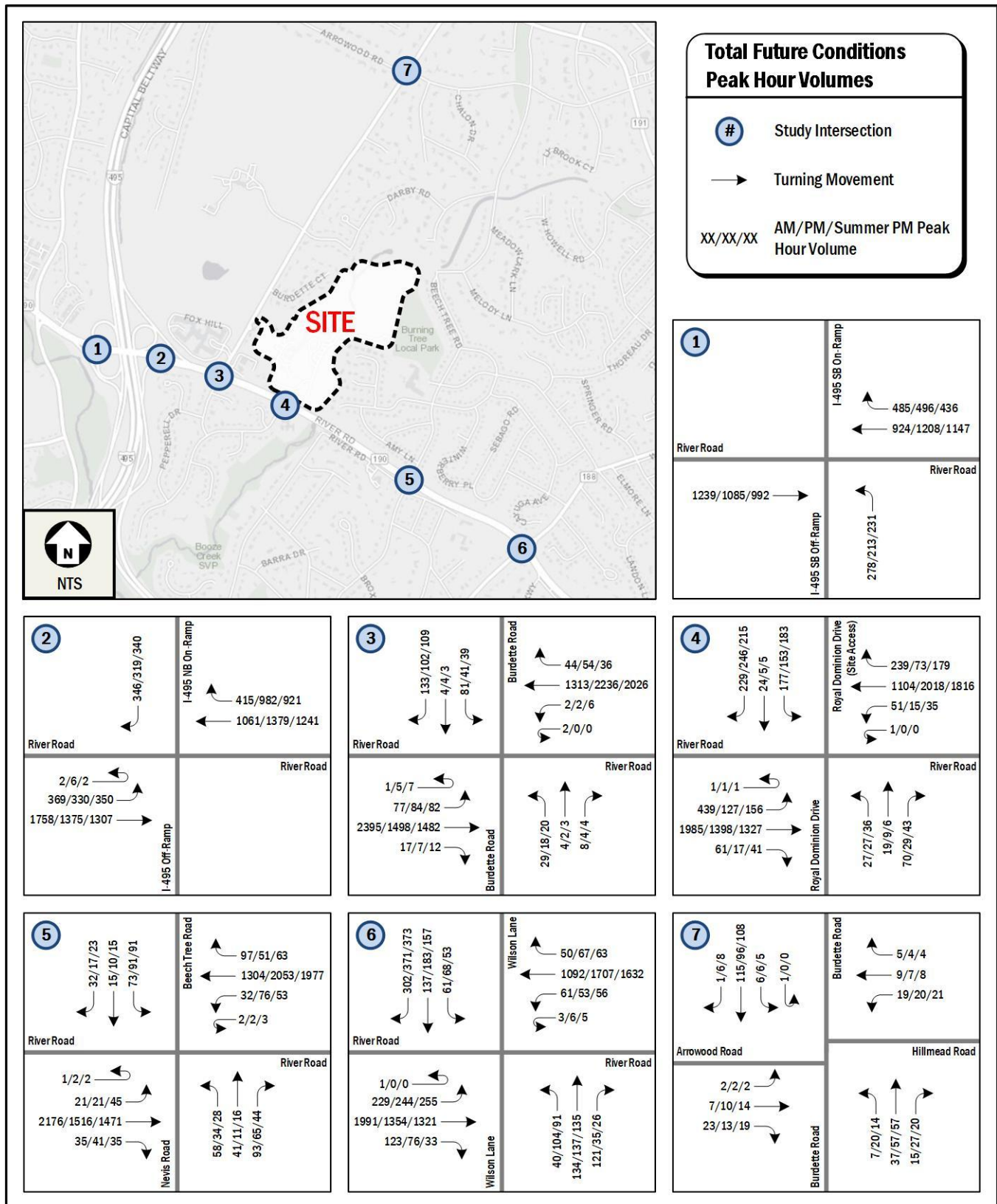


Figure 14: Total Future Conditions Peak Hour Volumes



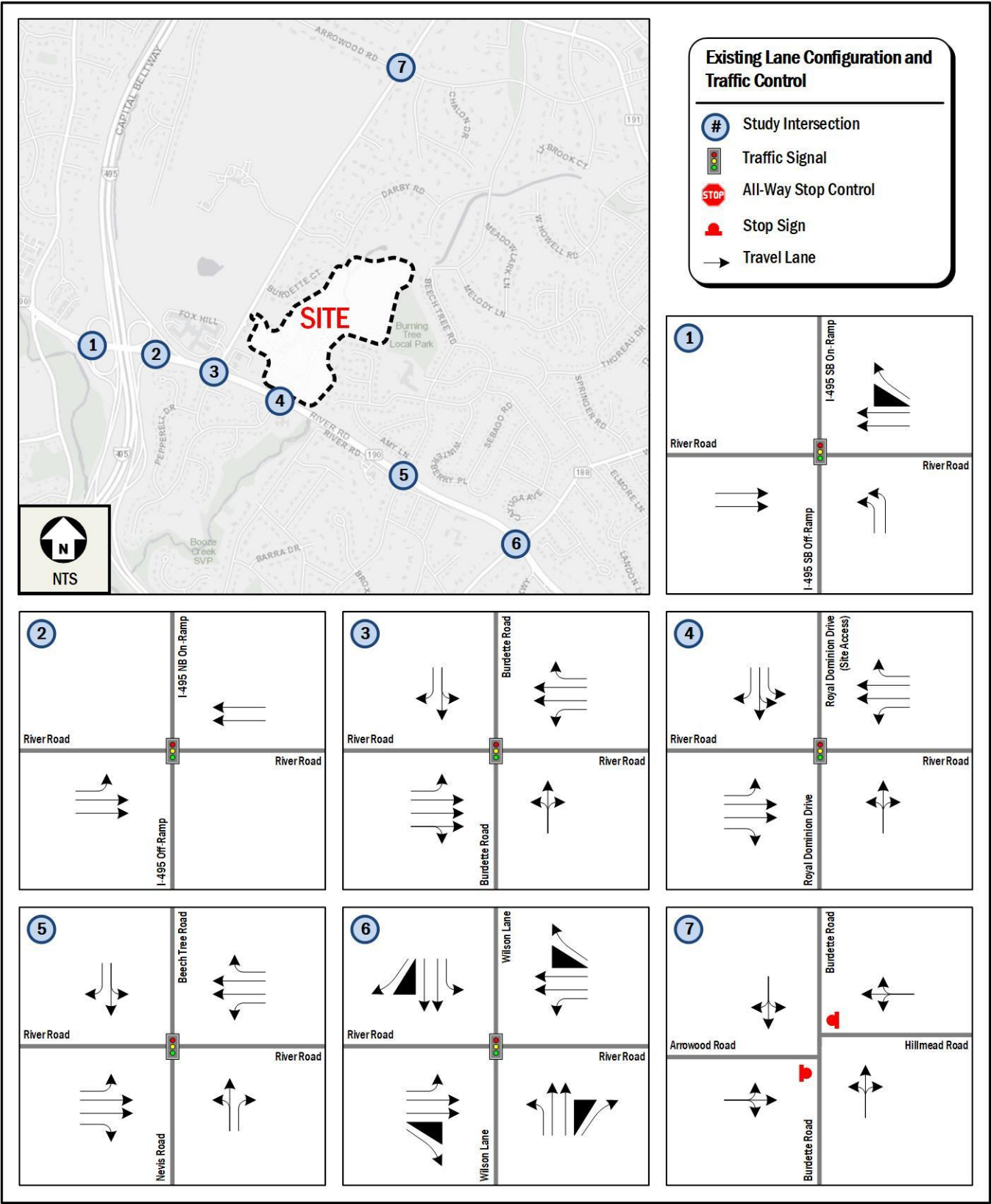


Figure 15: Existing Lane Configuration and Traffic Control



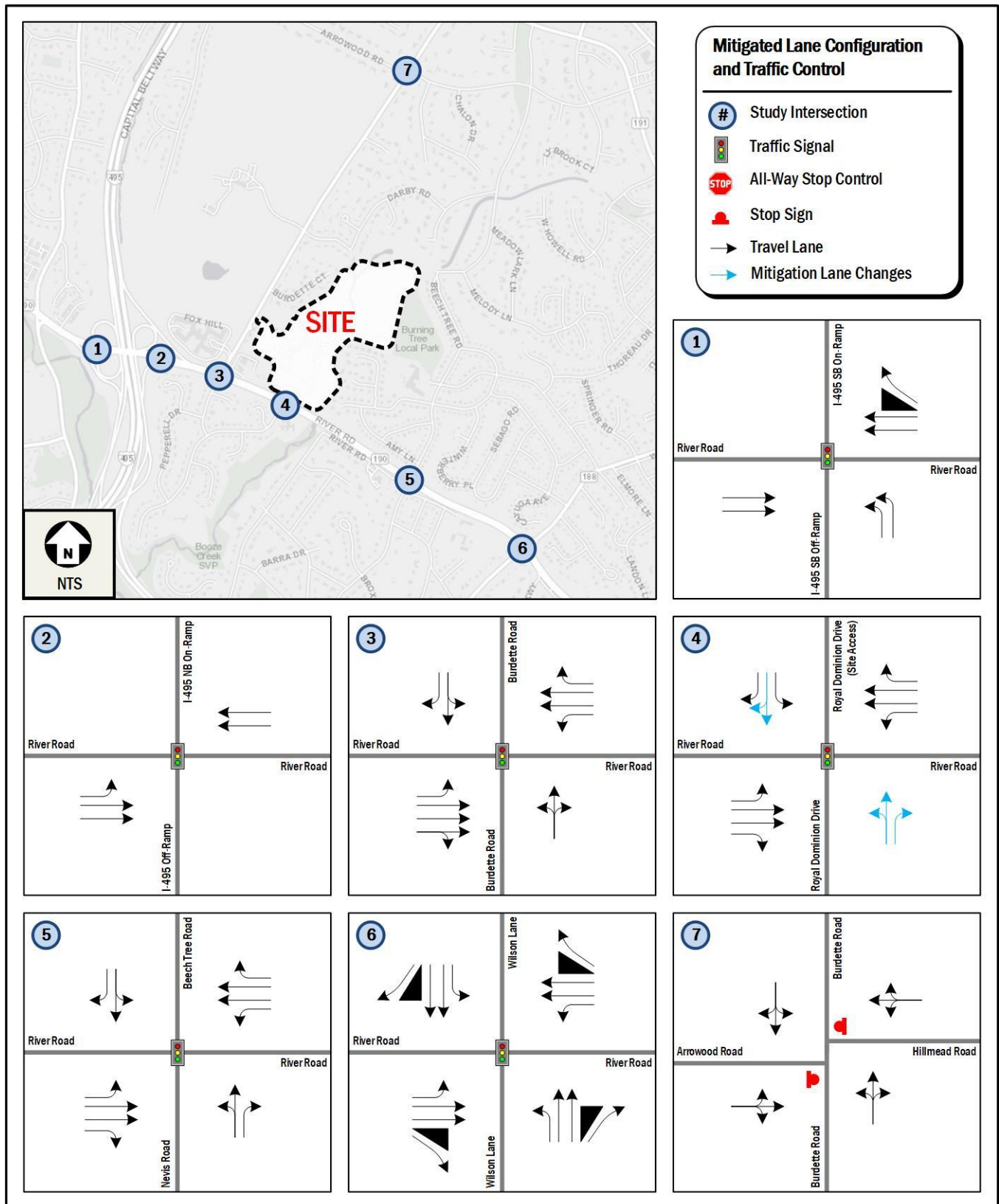


Figure 16: Mitigated Lane Configuration and Traffic Control

## Section 4: Pedestrian Facilities

This chapter reviews the existing and future pedestrian access to the site and reviews walking routes to and from the site. A review of the pedestrian system adequacy is also provided in this chapter.

The following conclusions are reached within this chapter:

- The existing pedestrian infrastructure surrounding the site requires improvements to provide an adequate walking environment in all directions.
- Gaps in the pedestrian network exist in the form of missing or narrow sidewalks, missing or narrow buffers, deficient streetlighting, missing crossings and curb ramp deficiencies.
- In accordance with the proportionality guide, the project is not required to make improvements to the surrounding pedestrian network as it does not involve any new construction or additional floor space.

### ***Existing Facilities Overview***

As part of the multi-modal adequacy review included in this LATR, pedestrian, bicycle, and transit facilities around the proposed project site were evaluated.

There are minimal pedestrian facilities within the PLOC study area. Pedestrian connectivity to and from the site is limited by missing sidewalks, insufficient buffers, and inadequate crossings.

### ***Pedestrian Circulation***

Pedestrian access to the site is available via Royal Dominion Drive. Internal pedestrian circulation routes will provide connectivity within the site.

### ***Pedestrian System Adequacy***

For any project generating 50 net new peak-hour weekday trips, quantitative pedestrian system adequacy analysis is required to assess the existing system's adequacy along with the project's trip generation.

The Pedestrian System Adequacy Test consists of three (3) components:

- Pedestrian Level of Comfort (PLOC),
- ADA Compliance, and
- Streetlighting.

### **PLOC Review and Methodology**

The Pedestrian Level of Comfort (PLOC) Review is based on an analysis of how comfortable it is to navigate pedestrian pathways within the project study area. Streets in Montgomery County are ranked from PLOC-1 ("Very Comfortable") to PLOC-4 ("Undesirable"). These ratings are based on several factors, including pathway width, width of buffer between the pathway and the street, speed limit of the adjacent street, and the presence of on-street buffers such as parking lanes or separated bike lanes. PLOC ratings are also given to street crossings and are determined by the number of lanes in the street to be crossed, the speed limit of that street, and the existing conditions of the crossing (if there are marked crosswalks, medians, etc.).

The goal of the PLOC Review is to identify any locations within the study area that are either a PLOC-3 ("Uncomfortable") or a PLOC-4 ("Undesirable") and find improvements to bring them to a PLOC-1 or PLOC-2.

### **PLOC Study Area**

The study area is limited to roadways classified primary residential and higher and is based on the site's policy area and peak-hour person trips. Based on the project site's location within an Orange Policy Area and trip generation, the required PLOC study area is a 900-foot walkshed beyond the site frontage. The PLOC study area is shown in Figure 17. The PLOC study area presented in Figure 17 is based on Planning Staff feedback and was reviewed and approved during the scoping process. The facilities inventory and adequacy review were conducted for the larger of the two (2) study areas presented in Figure 17.

### **PLOC Deficiencies**

As part of the PLOC review, the score ratings available from the Montgomery County PLOC Database were reviewed and field verified based on data collection within the study area that included verification of sidewalk and buffer widths, speed limits, and presence of on-street separation.

Based on the PLOC review, approximately 7,905 linear feet off-site did not meet PLOC adequacy standards. More specifically:

- 7,480 linear feet total of pathways did not meet PLOC adequacy standards

- 425 linear feet of crossings did not meet PLOC adequacy standards

Figure 18 presents the location of the identified PLOC deficiencies where facilities do not meet the criteria for a comfortable score. Table 10 outlines the identified deficiencies and improvements required to achieve an adequate PLOC score.

### ADA Compliance Review and Methodology

Per the 2023 LATR Guidelines, the project is required to conduct an American Disabilities Act (ADA) Compliance Review using the ADA Curb Ramps Survey form as available directly from the ADA website. The survey includes a detailed assessment of the attributes of every curb ramp located within a specified walkshed. The list of reviewed attributes includes the following:

- Ramp width
- Ramp slopes
  - Cross-slope
  - Running-slope
  - Gutter slope
- Slopes of flared sides
- Landing width
- Sidewalk width
- Presence of a detectable warning surface
- Height of level changes
- Presence of parking lane
- Type of curb ramp

The ADA Compliance Review Study Area is one-half the size of the PLOC Study Area, which is a walkshed determined by the site's policy area and peak-hour person trips generated.

This study identified all locations where the above deficiencies were verified to exist.

### ADA Compliance Study Area

The study area is limited to roadways classified as primary residential and higher and is based on the site's policy area and peak-hour trips. Based on the project site location within an Orange Policy Area and the project's trip generation, the required ADA study area is a 450-foot walkshed beyond the site frontage. The ADA study area is presented in Figure 19.

### ADA Compliance Deficiencies

Based on the ADA review, 5 curb ramps do not meet ADA adequacy standards. More specifically:

- One (1) curb ramp are deficient in their gutter slope
- Two (2) curb ramps are deficient in their cross slope
- Three (3) ramps are deficient in the slope of their flared sides, or missing flared sides entirely
- Two (2) curb ramps are built up to the curb and not outside the path of cars

Figure 20 presents the location of the identified ADA deficiencies and Table 11 outlines the identified deficiencies and improvements required to provide ADA-compliant facilities. A detailed review of curb ramps within the ADA study area is included in the Technical Attachments.

### Streetlight Network Review, Methodology, & Study Area

Street lighting adequacy is based on MCDOT standards to ensure a sufficient level of street lighting is provided within the project's study area. Street lighting adequacy requires the applicant to identify deficiencies in the existing streetlight network within the PLOC study area (for this project, a 900-foot walkshed). Standards vary depending on roadway type and surroundings land uses. The street lighting study area is presented in Figure 17.

### Streetlight Network Deficiencies

Based on the streetlight network review, approximately 31 streetlights are needed to meet streetlight network adequacy standards.

The segments missing streetlights are identified in Figure 21. Table 12 outlines the applicable spacing standard and number of streetlights required to achieve adequacy. An inventory of the reviewed streetlights that includes pole numbers, where available, and approximate GIS coordinates is included in the Technical Attachments.

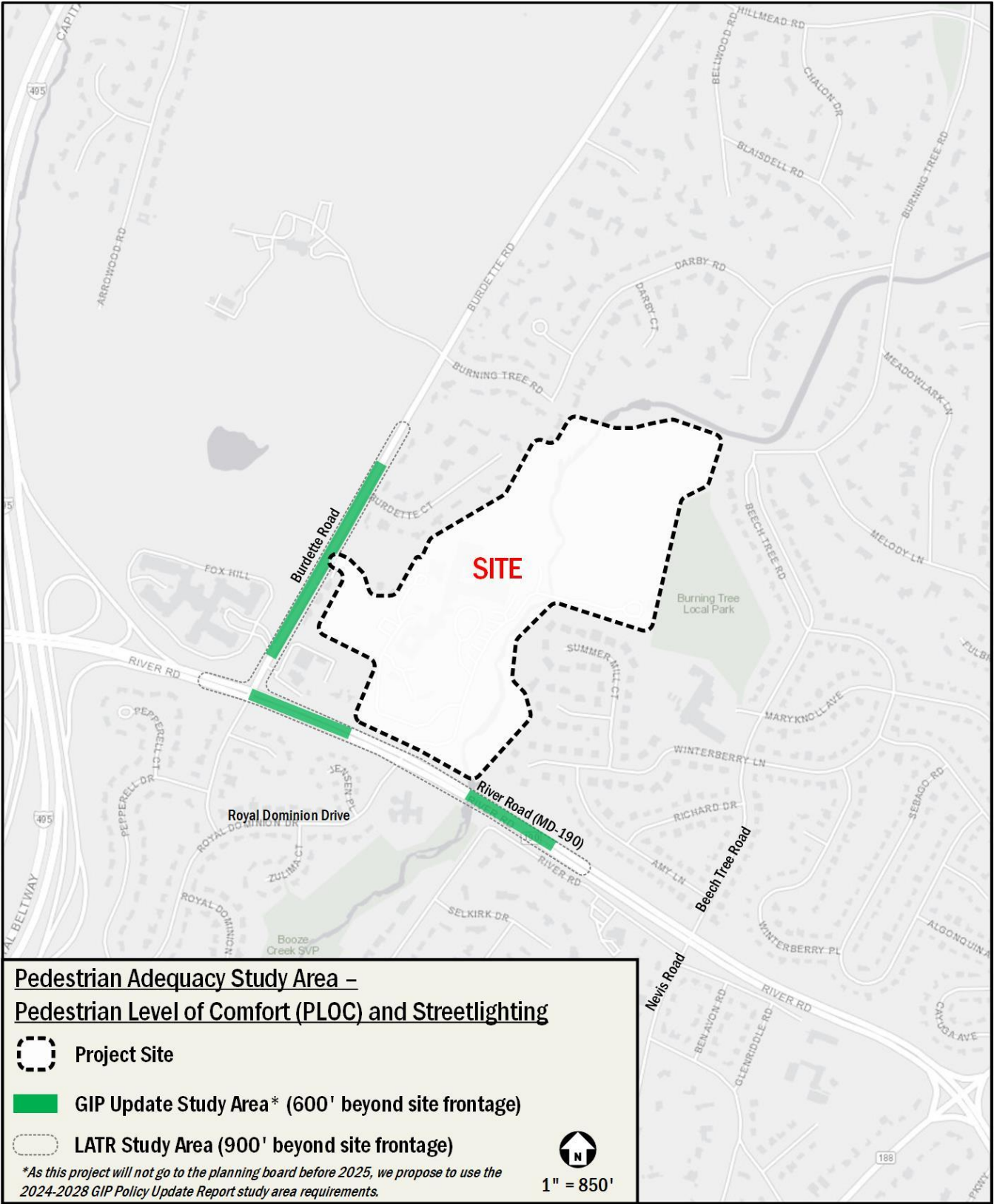


Figure 17: Pedestrian System Adequacy PLOC and Streetlights Study Area





Figure 18: PLOC Adequacy Evaluation



Table 10: PLOC Deficiencies

#	Location	Category	Existing PLOC Score	PLOC Deficiency	Adequacy Mitigation	Mitigation Linear Feet	PLOC Score After Mitigation	Notes
PLOC - Segments								
1	River Road: east of Site (north side)	PLOC - Pathway	4	No sidewalk	Add sidewalk (11' default, 8' min) with buffer (8' default)	1,100'	2	BLTS #30
2	River Road: east of Site (south side)	PLOC - Pathway	4	No sidewalk	Add sidewalk (11' default, 8' min) with buffer (8' default, 6' min)	1,100'	2	BLTS #31
3	River Road: west of Site (north side)	PLOC - Pathway	4	No sidewalk	Add sidewalk (11' default, 8' min) with buffer (8' default, 6' min)	300'	2	BLTS #32
4	River Road: west of Site (north curb)	PLOC - Pathway	3	No DPL or SBL/buffer too narrow	Expand street buffer (8' default, 6' min)	75'	2	BLTS #33
5	River Road: west of Site (south side)	PLOC - Pathway	4	No sidewalk	Add sidewalk (11' default, 8' min) with buffer (8' default, 6' min)	300'	2	BLTS #36
6	River Road: west of Site (south curb)	PLOC - Pathway	3	No DPL or SBL/buffer too narrow	Expand street buffer (8' default, 6' min)	120'	2	BLTS #37
7	Burdette Road: south of Private Road/Site Frontage (east side)	PLOC - Pathway	4	No sidewalk	Add sidewalk (11' default, 8' min) with buffer (8' default, 6' min)	825'	2	
8	Burdette Road: north of Private Road/Site Frontage (east side)	PLOC - Pathway	4	No sidewalk	Add sidewalk (11' default, 8' min) with buffer (8' default, 6' min)	900'	2	
9	Burdette Road: north of Private Road/Site Frontage (west side)	PLOC - Pathway	4	No sidewalk	Add sidewalk (11' default, 8' min) with buffer (8' default, 6' min)	900'	2	
10	River Road: west of Burdette Road (north)	PLOC - Pathway	3	No DPL or SBL/buffer too narrow	Expand street buffer (8' default, 6' min)	150'	2	BLTS #34
11	River Road: west of Burdette Road (south)	PLOC - Pathway	4	No sidewalk	Add sidewalk (11' default, 8' min) with buffer (8' default, 6' min)	150'	2	BLTS #35
12	Site Frontage: west of Royal Dominion Drive (north)	PLOC - Pathway	4	No sidewalk	Add sidewalk (11' default, 8' min) with buffer (8' default, 6' min)	350'	2	BLTS #38
13	Site Frontage: east of Royal Dominion Drive (north)	PLOC - Pathway	4	No DPL or SBL/buffer too narrow	Expand street buffer (8' default, 6' min)	430'	2	BLTS #39
14	Site Frontage: west of Royal Dominion Drive (south)	PLOC - Pathway	4	No DPL or SBL/no buffer	Add street buffer (8' default, 6' min)	350'	2	BLTS #40
15	Site Frontage: east of Royal Dominion Drive (south)	PLOC - Pathway	4	No sidewalk	Add sidewalk (11' default, 8' min) with buffer (8' default, 6' min)	430'	2	BLTS #41
PLOC - Crossings								
16	River Road midblock crossing	PLOC Crossing - Uncontrolled	3	Speed too high, unsignalized	Install high visibility crosswalk, reduce speed to 30	130'	2	
17	Royal Dominion Drive/River Road (east side)	PLOC Crossing - Signalized	4	No centerline/refuge island, speed too high	Install refuge island, reduce speed to 30	15'	2	
18	Royal Dominion Drive/River Road (south side)	PLOC Crossing - Signalized	3	No centerline/refuge island, speed too high	Install refuge island, reduce speed to 30	15'	2	
19	Royal Dominion Drive/River Road (west side)	PLOC Crossing - Signalized	4	No crosswalk	Install high visibility crosswalk, reduce speed to 30	100'	2	
20	Royal Dominion Drive/River Road (north side)	PLOC Crossing - Signalized	4	No crosswalk	Install high visibility crosswalk, reduce speed to 30	55'	2	
21	Burdette Road/River Road (south side)	PLOC Crossing - Signalized	3	No centerline/refuge island, speed too high	Install refuge island, reduce speed to 30	10'	2	
22	Burdette Road/River Road (east side)	PLOC Crossing - Signalized	3	Speed too high	Reduce speed to 30	0'	2	
23	Burdette Road/River Road (west side)	PLOC Crossing - Signalized	4	No crosswalk	Install high visibility crosswalk, reduce speed to 30	90'	2	
24	Burdette Road/River Road (north side)	PLOC Crossing - Signalized	3	No centerline/refuge island, speed too high	Install refuge island, reduce speed to 30	10'	2	
Total PLOC Off-Site Deficiencies:						7,905'		

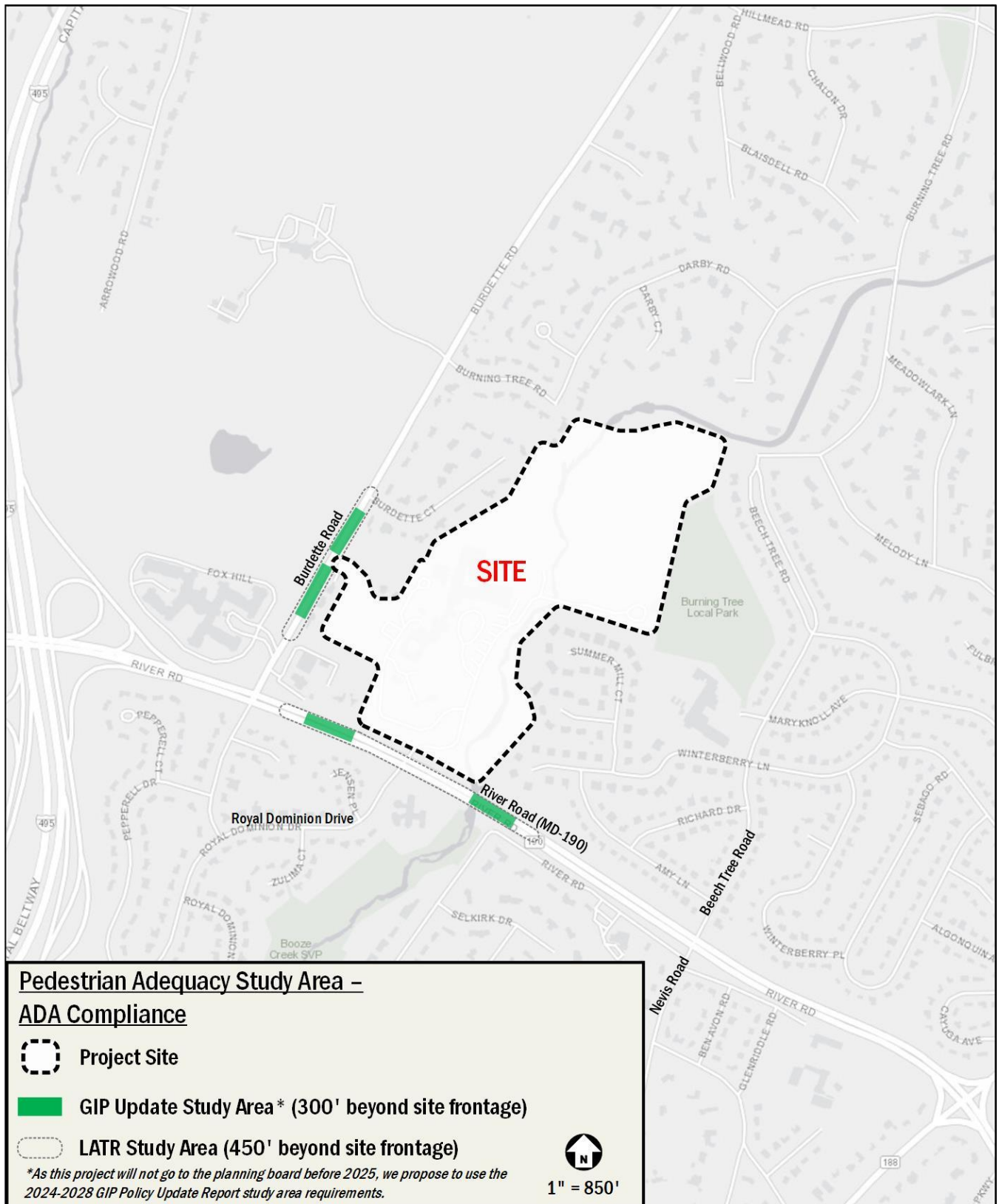


Figure 19: Pedestrian System Adequacy ADA Compliance Study Area





Figure 20: ADA Compliance Adequacy Evaluation





Figure 21: Streetlighting Deficiencies

**Table 11: ADA Deficiencies**

#	Location	Category	ADA Deficiency	Adequacy Mitigation
25	River Road & Royal Dominion Drive: SW corner	Curb Ramp	Cross slope and flared side slope exceed standards	Rebuild with appropriate cross slope and flared side slope
26	River Road & Royal Dominion Drive: SE corner, facing Royal Dominion Drive	Curb Ramp	Gutter slope exceeds standards, missing a flared side	Rebuild with appropriate gutter slope and flared side
27	River Road & Royal Dominion Drive: SE corner, facing river Road	Curb Ramp	Missing flared side	Rebuild with flared side
28	River Road midblock crossing - between Royal Dominion drive and Nevis/Beech Tree Road: north side	Curb Ramp	CR built up to the curb and not outside the path of cars	Rebuild with more space between CR and traffic
29	River Road midblock crossing - between Royal Dominion drive and Nevis/Beech Tree Road: south side	Curb Ramp	Cross slope exceeds standards, CR built up to the curb and not outside the path of cars	Rebuild with appropriate cross slope and more space between CR and traffic

**Table 12: Streetlight Spacing Deficiencies**

#	Location	Category	Streetlighting Deficiency	Adequacy Mitigation
49	Burdette Road between Private Road and Burdette Court	Streetlighting	Greater than 300' distance between streetlights	Add one (1) new streetlight
50	River Road between Royal Dominion Drive and Burdette Road (north side)	Streetlighting	Greater than 150' distance between streetlights	Add five (5) new streetlights
51	River Road between Royal Dominion Drive and Burdette Road (south side)	Streetlighting	Greater than 150' distance between streetlights	Add six (6) new streetlights
52	River Road east of Royal Dominion Drive (north side)	Streetlighting	Greater than 150' distance between streetlights	Add nine (9) new streetlights
53	River Road east of Royal Dominion Drive (south side)	Streetlighting	Greater than 150' distance between streetlights	Add ten (10) new streetlights



## Section 5: Bicycle Facilities

This chapter summarizes existing and future bicycle access and reviews the quality of cycling routes to and from the site. A review of the adequacy of the existing bicycle system is also provided in this chapter.

The following conclusions are reached within this chapter:

- There are non-continuous conventional bike lanes along River Road (MD-190);
- The future bicycle network as identified in the Bicycle Master Plan will include a sidepath along River Road (MD-190);
- In accordance with the proportionality guide, the project is not required to make improvements to the surrounding bicycle network as it does not involve building additional square footage.

### **Existing Bicycle Facilities**

Currently, there are conventional bicycle lanes along River Road that are interrupted where acceleration/deceleration lanes are present. The conventional bike lanes are not continuous and do not provide sufficient bicycle connectivity around the project site.

### **Planned Bicycle Facilities**

According to the planned bicycle network from the Montgomery County Bicycle Master Plan, there are planned sidepaths along River Road (MD-190).

The existing and planned bicycle facilities around the project site are shown in Figure 22.

### **Bicycle System Adequacy**

The bicycle system adequacy test requires that the Applicant identify any conditions where the Bicycle Level of Traffic Stress (BLTS) is above a BLTS score of two (2) “low stress”. The BLTS, like the PLOC, is a measure that quantifies the amount of discomfort that people feel due to vehicle traffic when they bicycle on different types of streets. The BLTS for a roadway segment is a number between zero (0) and four (4), where

BLTS-0 represents no traffic stress present, such as on an off-street trail, and BLTS-4 represents a very high level of stress, such as on a high-speed road with no dedicated bicycle facilities. This score is determined through roadway characteristics such as the road’s speed limit, the presence of a center line, parking turnover, the presence of bike lanes and paths, and any physical separation between these lanes/paths and vehicular traffic. Wherever the BLTS is greater than two (2), improvements should be identified to improve it to the Bicycle Master Plan facility or to BLTS-2 or BLTS-1 where no facility is identified.

### **Bicycle System Adequacy Study Area**

The Bicycle System Adequacy Study Area is determined by the site’s policy area and peak-hour person trips generated. Unlike ADA, PLOC, or Streetlight compliance, the walkshed is not limited to roadways classified primary residential and higher—any public roadway is applicable.

Given this site’s location within an Orange Policy Area and project trip generation, the Bicycle System Adequacy study area is 1,000 feet beyond the site frontage. The Bicycle Adequacy study area is presented in Figure 23. As with the pedestrian network adequacy study area, the bicycle adequacy evaluation was conducted based on the larger study area.

### **Bicycle System Adequacy Deficiencies**

As part of the BLTS review, the score ratings available from the Montgomery County BLTS Database were confirmed through verification of sidewalk/sidepath widths and presence of on-street facilities.

Based on the Bicycle System Adequacy review, the section of River Road within the study area is ranked at a Moderate High and High level of stress. The sidepath along River Road in the County’s Bicycle Master Plan is planned to improve the BLTS to a level 2, meeting adequacy standards.

A summary of the Bicycle System Adequacy review is outlined in Table 13 and Figure 24.



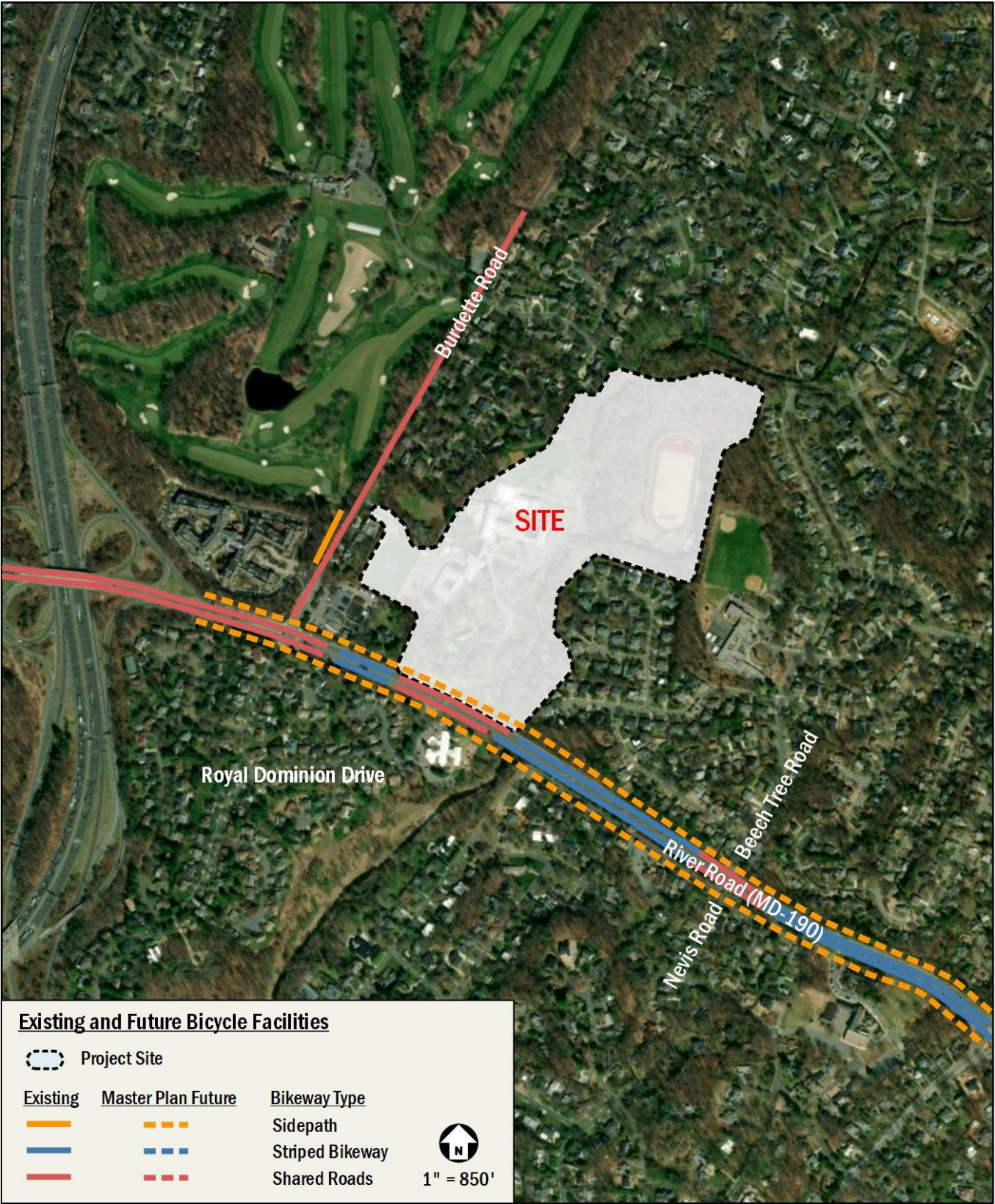


Figure 22: Existing and Future Bicycle Facilities



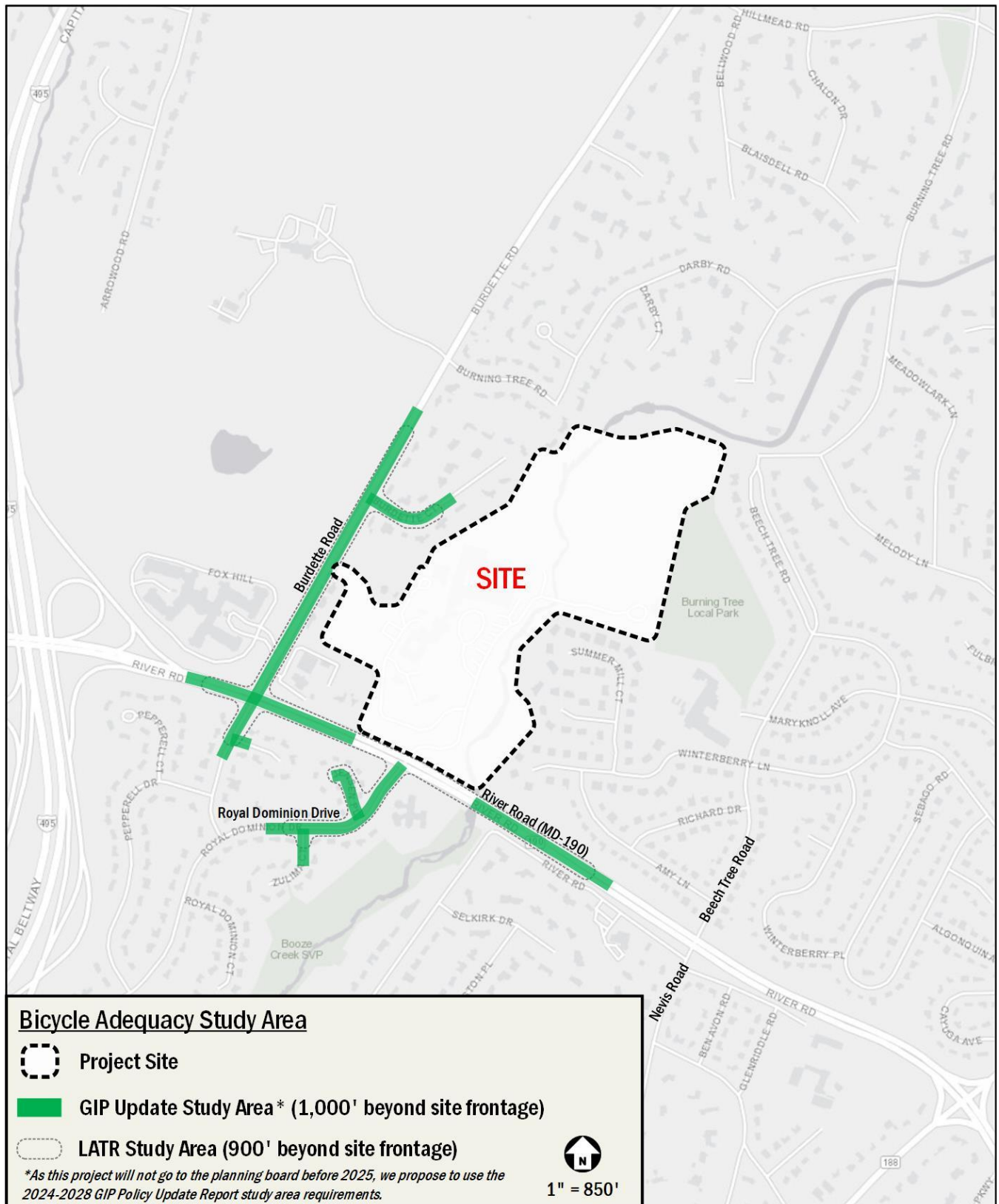


Figure 23: Bicycle Adequacy Study Area





Figure 24: Bicycle Level of Traffic Stress Adequacy Evaluation



**Table 13: BLTS Deficiencies**

#	Location	Existing BLTS	Adequacy Mitigation	BLTS After Mitigation	Mitigation Linear Feet
30	River Road: east of site (north side)	3	Construct sidepath	2	1400
31	River Road: east of site (south side)	3	Construct sidepath	2	1400
32	River Road: west of site (north side)	3	Construct sidepath	2	300
33	River Road: east of Burdette Road (north side)	4	Construct sidepath	2	340
34	River Road: west of Burdette Road (north)	4	Construct sidepath	2	70
35	River Road: west of Burdette Road (south)	4	Construct sidepath	2	70
36	River Road: west of site (south side)	4	Construct sidepath	2	230
37	River Road: east of Burdette Road (south side)	4	Construct sidepath	2	340
38	Site Frontage: west of Royal Dominion Drive (north)	4	Construct sidepath	2	220
39	Site Frontage: east of Royal Dominion Drive (north)	4	Construct sidepath	2	280
40	Site Frontage: west of Royal Dominion Drive (south)	4	Construct sidepath	2	290
41	Site Frontage: east of Royal Dominion Drive (south)	4	Construct sidepath	2	280
<b>Total BLTS Off-Site Deficiencies:</b>					<b>5,220'</b>

## Section 6: Transit Facilities

This chapter discusses the existing transit facilities in the vicinity of the site, accessibility to transit, and evaluates the overall transit impacts of the project.

The following conclusions are reached within this chapter:

- The project site has access to regional and local transportation facilities that accommodate staff, student, and visitor trips.

### Existing Transit Service

The project site has access to regional and local transit services through Metrobus. A stop for the WMATA Metrobus T2 line located along the site frontage, and there are seven (7) stops total within the study area. This line provides a direct connection to the Friendship Heights metro stop on the Red Line, which connects Rockville, MD with Glenmont, MD while providing access to the District core. Connections can be made at the Metro Center and Gallery Place-Chinatown stations to access the five (5) other Metrorail lines, allowing access to destinations in Virginia and Prince George’s County, Maryland. As of February 2024, Red Line trains run every six (6) minutes till 9:30 PM on weekdays and weekends and every five (5) minutes during the AM and PM Rush hours on the weekdays. Late-night trains after 9:30 PM run every 10 minutes during weekdays and weekends. Metrorail currently begins at 5:00 AM and 7:00 AM on weekdays and weekends, respectively. Service ends at 12:00 AM on Sunday through Thursday and 1:00 AM on Friday and Saturday.

### Bus Transit System Adequacy

The Bus Transit System Adequacy Test, for Orange policy areas, requires that the applicant identify the need for new bus shelters. To reach adequacy standards, there must be three (3) bus shelters with Real Time Information displays (RTI) within the study area.

### Bus Transit System Adequacy Study Area

The Bus Transit System Adequacy Study Area is determined by the site’s policy area and peak-hour person trips generated. For projects in an Orange Policy Area generating over 200 trips, the study area outlined in the LATR is 1,300’ beyond site frontage, with three (3) shelters (with Real-Time Displays or RTIs) required. The GIP update extends this study area to 1,500’. As the GIP update requires a larger study area, this standard was used for a more thorough analysis.

The Bus Transit Adequacy study area can be seen in Figure 25.

### Bus Transit System Adequacy Deficiencies

Based on the Bus Transit System Adequacy review, shown in Figure 26, adequate transit facilities are not available under existing conditions per the County standard of two (3) shelters with RTI displays within 1,500 feet of the site frontage. There are currently no existing stops that feature shelters and RTI displays, and only one (1) bus stop in the study area features a shelter. A summary of transit deficiencies is provided in Table 14..

Table 14: Bus Stop Deficiencies

#	Location	Stop ID	Deficiency	Adequacy Mitigation	Mitigation Linear Feet
42	River Rd & Burdette Rd	2000140	No shelter or RTI	Add shelter and RTI	N/A
43	River Rd & Burdette Rd	25374	No RTI	Add RTI	N/A
44	River Rd & Royal Dominion Dr	2000134	No shelter or RTI	Add shelter and RTI	N/A
45	River Rd & Dominion Dr	2001331	No shelter or RTI	Add shelter and RTI	N/A
46	River Rd & Helmsdale Rd	2001312	No shelter or RTI	Add shelter and RTI	N/A
47	River Rd & Helmsdale Rd	2001330	No shelter or RTI	Add shelter and RTI	N/A
48	River Rd & Beech Tree Rd	2001329	No shelter or RTI	Add shelter and RTI	N/A

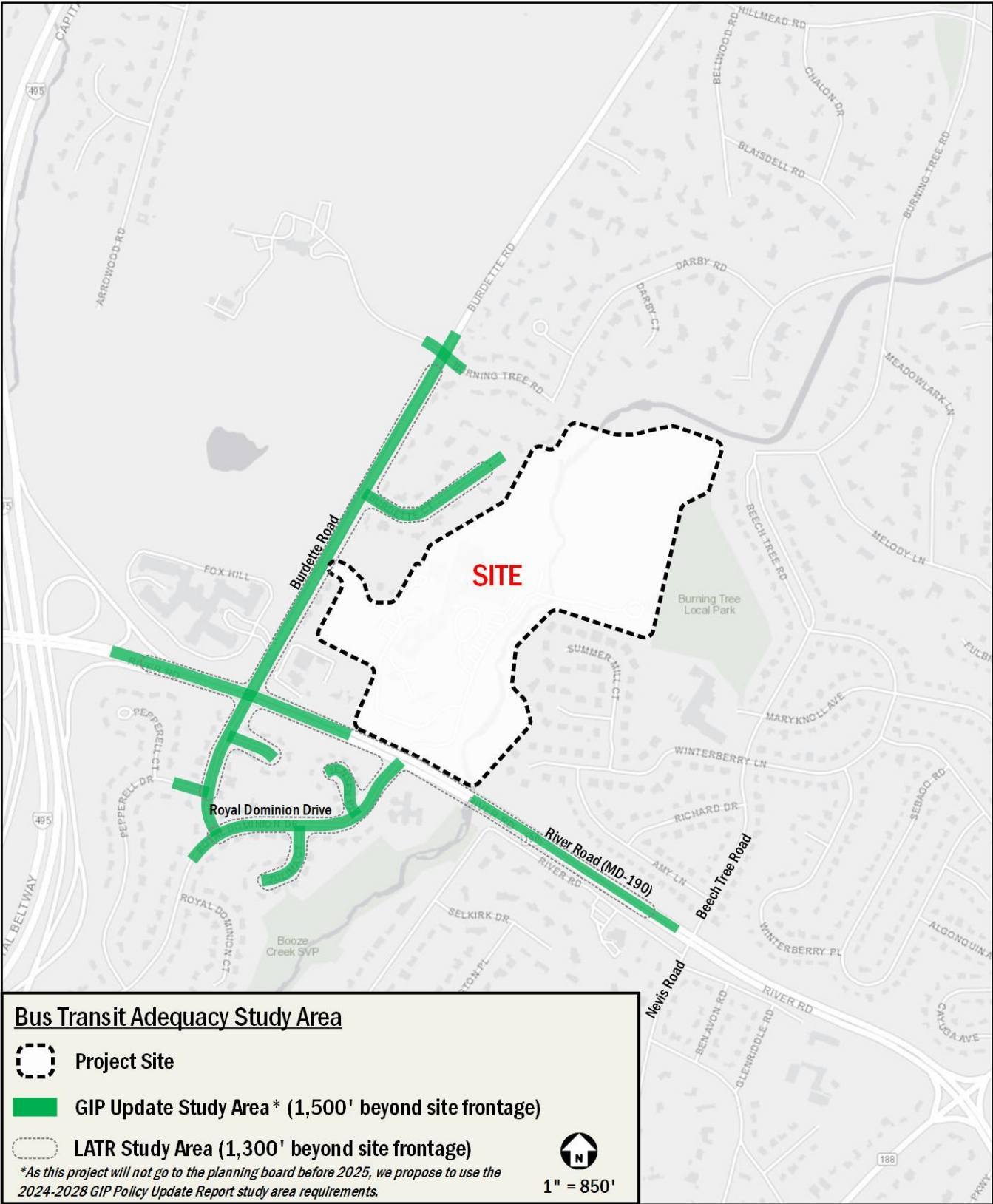


Figure 25: Transit Adequacy Study Area





Figure 26: Transit Deficiencies