April 2025

Marina Way Extension (UPC 120778)

Revised Environmental Assessment

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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
and
VIRGINIA DEPARTMENT OF TRANSPORTATION

Revised Environmental Assessment

Marina Way Extension

Prince William County, Virginia
State Project No.: 0639-076-348, C501, P101, R201
Federal Project No.: STP-5B01(441)
From: Marina Way at Annapolis Way
To: VA Route 123 (Gordon Boulevard) at Horner Road

Submitted Pursuant to 42 U.S.C. 4332(2)(C)

Approved for Public Availability

_____ _____

Date Federal Highway Administration

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Section 1 - Purpose and Need

1.1. Introduction

The Prince William County (County) Department of Transportation, in coordination with the Virginia Department of Transportation (VDOT) and Federal Highway Administration (FHWA), is preparing an Environmental Assessment (EA) to analyze the potential environmental effects associated with the proposed Marina Way Extension project (Project) between Annapolis Way and Gordon Boulevard (Route 123) in Woodbridge, Virginia. The EA is being prepared pursuant to the National Environmental Policy Act of 1969 (NEPA) and in accordance with FHWA regulations for implementing NEPA (23 CFR 771).

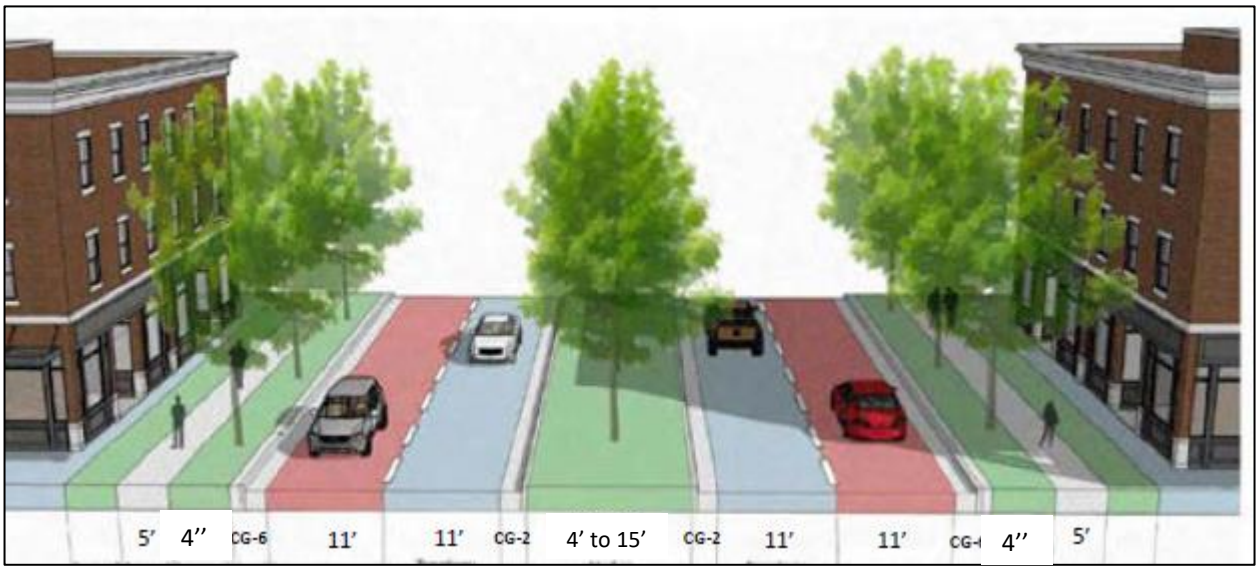
1.2. Study Area

The Project's study area is located in Woodbridge, Virginia northwest of the Jefferson-Davis Highway (Route 1) and Gordon Boulevard (Route 123) intersection and east of the Interstate-95 (I-95)/Route 123 interchange. As shown in **Figure 1-2**, Annapolis Way borders the northern portion and Route 123 borders the southern portion of the study area. The existing land use in the study area is commercial/retail properties in the southern half and undeveloped property in the northern half. Gordon Plaza is in the southern half of the study area. The northern portion of the study area is mostly forested with a small business park west of the Annapolis Way and Marina Way intersection and it includes Home Depot, Aldi, and other retail stores. The project is located within a federally designated metropolitan organization (MPO). The MPO for the metropolitan Washington, D.C. area is the National Capital Region Transportation Planning Board (TPB).

The Commonwealth of Virginia designated North Woodbridge as an Opportunity Zone in 2018 under the Federal Tax Cuts and Jobs Act of 2017 (TCJA). The TCJA provides tax benefits for potential developers and investors in North Woodbridge. In 2006 the Metropolitan Washington Council of Governments (MWCOG) identified Woodbridge as an Emerging Employment Center. These centers help guide transportation planning decisions to grow the economy in the area.

Recognizing the growth opportunity for the North Woodbridge area, the County has focused on planning revitalization efforts for this area. A major component of this planned revival is the North Woodbridge Town Center. A town center allows for mixed-use development within a small area that promotes walkability and bikeability as illustrated on **Figure 1-1**. Mixed-use development typically includes residential, office, civic, and retail spaces. Town centers include a main street. For North Woodbridge, the intended main street is the Marina Way Extension.

Figure 1-1: Proposed Project Roadway Typical Section



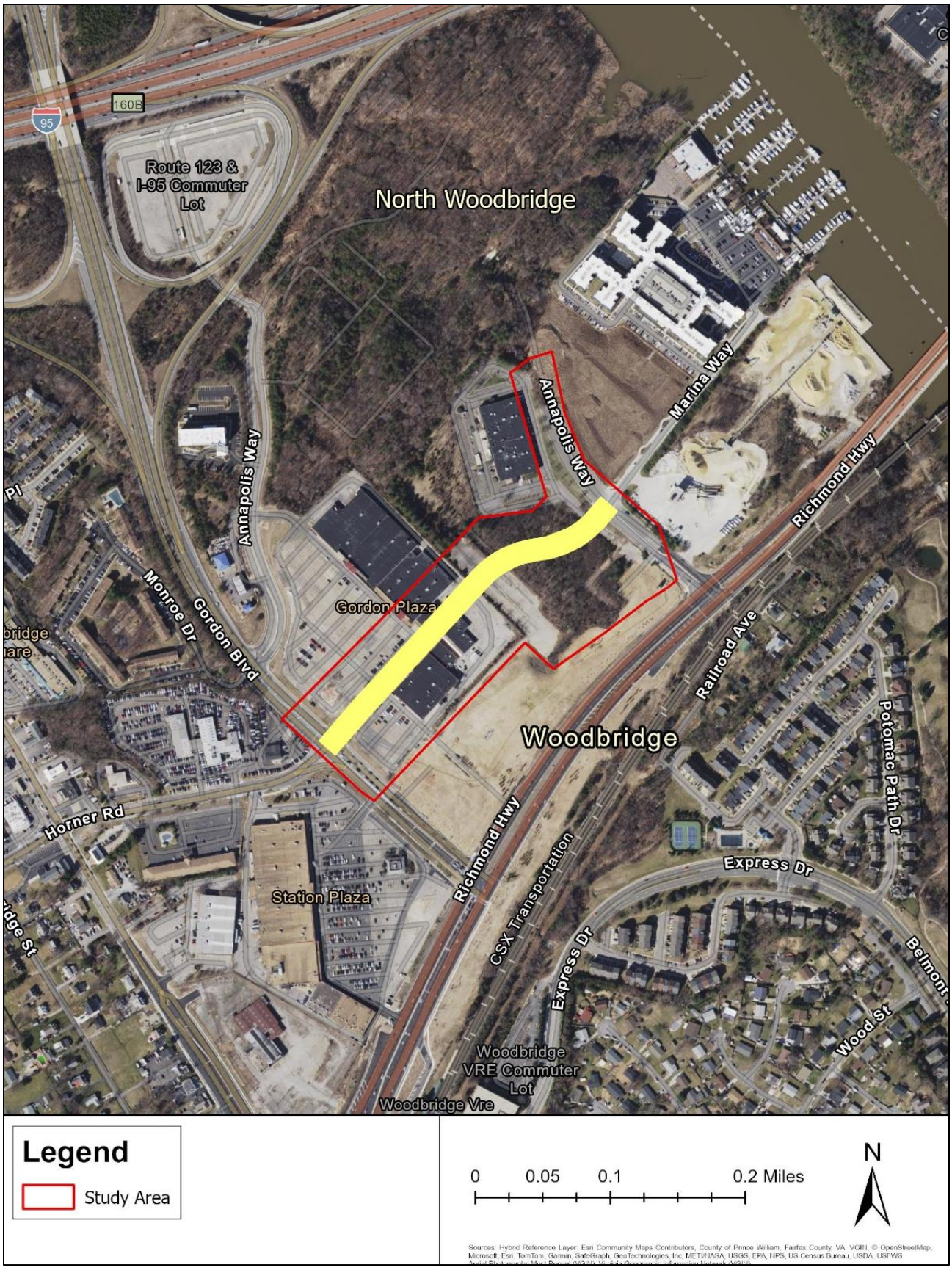
1.3. Project History

In 2005, the County prepared the North Woodbridge Urban Mixed Use Master Zoning Plan to identify a vision for North Woodbridge to be a mixed-use area. The plan's key element for this area was to extend Horner Road to Marina Way to provide connectivity between local shopping and the medium to high-density residential condominium and apartments planned for the area. (County 2005)

The Prince William Board of County Supervisors adopted the North Woodbridge Small Area Plan on October 8, 2019. This small area plan is part of the County's Comprehensive Plan and puts significant focus on revitalization and redevelopment for the North Woodbridge area. A key element in the Plan is providing a connection between Horner Road and Marina Way. This connection is intended to be a main street surrounded by commercial, residential, retail, and walkable streets. The Plan indicates that the main street would provide a pedestrian spine through the town center connecting to a future Fast Ferry Terminal and a proposed waterfront boardwalk. (County 2019)

The Mobility Plan states that the Marina Way extension termini is Annapolis Way to Route 123, and the roadway would be a multi-modal, through boulevard. The Plan asserts that the North Woodbridge Town Center should include a network of streets that provides an extension of Horner Road across Route 123 to intersect Annapolis Way which provides access to the Occoquan Harbor Marina, as well as the Annapolis Way extension as it is already planned. The Plan also indicates that the "roadways cannot be evaluated through traditional capacity measures, such as Level of Service for intersections and road segments." (County 2019). The Plan identifies proposed functional classification for the Marina Way extension as a boulevard with a UB-1 typical section that includes four lanes and 5-foot sidewalks on each side. The Mobility Plan also identifies a proposed trail, blueways, bicycle, and pedestrian network. This network of facilities is referred to as the Woodbridge Pedestrian and Bicycle Loop and consists of a system of trails and sidewalks that will allow residents and visitors to explore the area.

Figure 1-2: Study Area



The TPB approved the update to Visualize 2045 on June 15, 2022. Visualize 2045 is the federally mandated regional long-range transportation plan that identifies the region's transportation agencies' projects that are expected to be funded between now and 2045.

The Project is included in the air quality conformity analysis of the 2022 update to Visualize 2045 approved on June 15, 2022. The project is programmed in both the FY2023-2026 Transportation Improvement Plan (TIP) and the draft FY2024-2027 Statewide Transportation Improvement Program (STIP), Virginia's federally required four-year transportation improvement program. Therefore, the Project meets fiscal constraint requirements.

1.4. Needs

1.4.1. Existing Conditions

Access and Connectivity in the North Woodbridge Area

The study area consists of a roadway network composed of streets and principal arterials. Each of these roadways provide pedestrian access to the study area via sidewalks and shared-use path (SUP). Marina Way is a two-lane avenue/street that has an unsignalized intersection with Annapolis Way and a sidewalk along the southbound lane. It serves as the only connection to a marina at Occoquan Harbor, Vulcan Materials Company Woodbridge sand yard, and the Rivergate apartments. Marina Way does not provide pedestrian or vehicle access to the proposed North Woodbridge Town Center and points south of the study area such as the VRE station and I-95/Route 123 Commuter Lot. The only way pedestrians and vehicles can access these destinations from Marina Way is if they travel along eastbound Annapolis Way to Route 1 and head south to Route 123 at Route 1 intersection. At that point they can utilize Route 123 to access the proposed North Woodbridge Town Center at the Route 123 at Horner Road intersection, access the I-95/Route 123 Commuter Lot from the Route 123 and Annapolis Way intersection, or continue traveling south along Route 1 to the VRE Station. The average annual daily traffic (AADT) for Marina Way is not available.

Marina Way's southern terminus is at its intersection with Annapolis Way in the northern portion of the study area. Annapolis Way is a four-lane divided street with sidewalks along the eastbound lanes that provides access from Route 1 to the Viridium apartment complex, a church, and business park. The business park and church access Annapolis Way through the southside of the Annapolis Way and Marina Way intersection. Annapolis Way is the only way vehicles and pedestrians can access Marina Way from Route 1 and destinations north and south of the study area. Currently, access is restricted along Annapolis Way west of the Marina Way intersection because it dead ends at the Viridium apartments. The AADT for this section of Annapolis Way is not available. There is a separate section of Annapolis Way that intersects with Route 123 just east of the I-95/Route 123 interchange. This section of Annapolis Way between Route 123 and Destination Place provides access to the I-95/Route 123 Commuter Lot and has sidewalks on both sides of the roadway from Route 123 to just north of Hampton Inn where the sidewalk along the northbound lanes terminates at the entrance into The Landing at Mason's Bridge apartment complex. This section of Annapolis Way has an AADT of 2,700 (VDOT, 2019).

Route 123 is located along the southern boundary of the study area. It is a four-lane divided principal roadway with a sidewalk along the northside of Route 123 between Annapolis Way and approximately

200 feet beyond the Horner Road intersection arterial that terminates at its signalized connection with Route 1. There is also a sidewalk along the southside of Route 123 between Route 1 and Horner Road. Route 123 has signalized intersections with Route 1, Horner Road, and Annapolis Way and the AADT between Route 1 and I-95 is 19,000. (VDOT, 2019) The Route 123 at Horner Road intersection provides direct access to a parking lot at the existing Gordon Plaza shopping center which is the same area as the proposed North Woodbridge Town Center.

Route 1 or Richmond Highway is a six-lane principal arterial with a SUP along the southbound lanes that is located east of the study area. Route 1 intersects with Annapolis Way and Route 123 and is recognized as a major thoroughfare that serves the eastern portion of Prince William County. Vehicles and pedestrians utilizing Marina Way that want to access the proposed North Woodbridge Town Center, I-95/Route 123 Commuter Lot, VRE Station, and destinations north and south of the study area have to utilize Route 1 and it's SUP, respectively. This section of Route 1 has an AADT of 39,000. (VDOT, 2019)

In summary, if pedestrians or vehicles on Marina Way want access to destinations north and south, including the VRE Station, the Occoquan River waterfront, the I-95/Route 123 Commuter Lot, and the proposed North Woodbridge Town Center, they need to utilize the other roadways. There is not direct access to these destinations from Marina Way. The need for the connection is supported by its continued inclusion in the TIP and other transportation planning and County's programming documents.

Traffic Forecasts and Travel Demand

Table 1-1 shows the operating condition for each Level of Service (LOS) category and criteria for stop-control, signalized, and interchange ramps as identified in the 2010 Highway Control Manual (HCM).

Table 1-1 LOS Definition

Level of Service	Operating Condition	MOEs Criteria		
		Delay (seconds/vehicle)		Density (pc/mile/lane)
		Intersection		Ramp
		Signalized	Stop-control	Merge/Diverge
A	Free-flow condition	<10	0-10	<10
B	Little congestion	10-20	>10-15	>10-20
C	Moderate congestion	20-35	>15-25	>20-28
D	Approaching heavy congestion	35-55	>25-35	>28-35
E	Unstable flow, congested condition	55-80	>35-50	>35
F	Severe congestion	>80	>50	Demand exceeds capacity

Source: HCM 2010

Traffic analysis completed for this study indicates existing traffic conditions (year 2023) at Marina Way and the Annapolis Way stop-control intersection has a LOS A for both the AM and PM peak periods. The AM delay is 5.5 seconds per vehicle (s/veh). The PM delay is 4.1 s/veh. The Route 123 at Horner Road signalized intersection has a LOS D during the AM peak period and a LOS F during the PM peak period. It experiences a 35.5 s/veh in the AM and 301.8 s/veh in the PM. This intersection is severely congested during the PM peak period and operates at over capacity. The LOS for Route 123 at Route 1, Route 1 at Annapolis Way, and Route 123 at Annapolis Way is not available.

Key issues identified in the traffic analysis confirmed what the travelers experience in the North Woodbridge area. The heavily traveled corridors of Route 123 and Route 1 have heavy congestion at their various intersections in the North Woodbridge area.

1.4.2. Future Conditions

Future Access and Connectivity in the North Woodbridge Area

The County's Mobility Plan identified a proposed network of trails, bicycles, and pedestrian facilities for the North Woodbridge area in the "Woodbridge Pedestrian and Bicycle Loop." Elements of this loop include the preferred trail connection of the Potomac Heritage National Scenic Trail (PHNST) that would provide the trails connection to the waterfront of the Occoquan River. Also, the pedestrian network includes constructing sidewalks on both sides of all streets and including high-visibility crosswalks at appropriate intersections in the North Woodbridge area. It also identifies a proposed pedestrian bridge crossing from the Woodbridge VRE to the west side of Route 1 allowing for safer pedestrian access between the proposed Woodbridge Town Center and the VRE station. Therefore, there is a need to improve pedestrian connectivity throughout the North Woodbridge area and to achieve the goals of the County's Mobility Plan by making destinations such as the Occoquan River waterfront, the VRE Station, and the I-95/Route 123 Commuter Lot more accessible for pedestrians.

Economic Development and Transportation Plans and Initiatives

The North Woodbridge area is one of the County's six designated regional activity centers. The Metropolitan Washington Council of Governments (MWCOG) defines a regional activity center as a location to "accommodate majority of the region's future growth and play a vital role in achieving the Region Forward Vision's prosperity, sustainability, accessibility, and livability goals. They include existing urban centers, priority growth areas, traditional towns, and transit hubs." (MWCOG, 2019)

Future Traffic Forecasts and Travel Demand

In 2020, the Marina Way Extension Traffic Analysis was prepared by Kittleson for VDOT. The analysis assessed the study area's intersections' level of service (LOS) for the year 2030. The traffic impact results for this scenario were taken directly from the Route 1 and the Route 123 Intersection Strategically Targeted Affordable Roadway Solutions (STARS) study. The STARS study models and results are used because this study used a travel demand model to project future demand based on the proposed land use from the Woodbridge Small Area Plan.

Utilizing the STARS study and models, the Marina Way Extension Traffic Analysis accounted for all signal timing changes reflecting new lane configurations and the following projects:

Table 1-2: 2030 LOS for Intersections

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	Delay (s/veh)	LOS	Delay (s/veh)
Route 1 and Annapolis Way	C	26	D	48.9
Route 1 and Route 123	E	65.8	D	43.8
Horner Road and Route 123	F	128	F	80.2
Annapolis Way and Route 123	F	108.5	C	20.2

Except for the AM Peak Hour at the Route 1 and Annapolis Way intersection and the PM Peak Hour at the Annapolis Way at Route 123 intersection, most of the intersections in the study area would be in an unstable flow, congested condition, or severely congested condition by the time the North Woodbridge Town Center opens.

The MWCOG Traffic Demand Model that utilized in the Route 1 and the Route 123 Intersection STARS study and the Marina Way Extension Traffic Analysis, indicates Route 1 and 123, the principal arterials that serve the North Woodbridge area, will continue to become congested with future traffic demand (**Table 1-3**).

Future Economic Development and Transportation Plans and Initiatives

MWCOG Round 9.1 forecasts between 2015 and 2040, the population of the North Woodbridge area will grow from 14,000 to 58,200, a 315.7% increase. During the same period, employment in the North Woodbridge area will increase from 3,700 to 19,000 jobs. This significant growth in jobs and population over the next 25 years will continue to place stress on traffic operations for the existing roadway network.

The Visualize 2045 plan identifies the construction of the Marina Way extension to connect with Horner Road at Route 123. The plan indicates that this extension will create an internal roadway network in the North Woodbridge area that will enhance multimodal access to the Route 123 Park and Ride lot, the potential Fast Ferry Terminal at the Occoquan Harbor Marina, and the Woodbridge VRE Station along Route 1. The Aspirational Initiatives component was included with the update. Under this component, the Marina Way Extended (CE3756) project was identified under the “Bring Jobs and Housing Closer Together” initiative because it included a boulevard section of roadway with pedestrian facilities on both sides to support nonmotorized transportation. The initiative is focused on bringing people closer to their work and other frequented destinations in the hopes of reducing travels times and trips while providing other modes of travel. (TPB 2022)

The development of the North Woodbridge Town Center is part of the County’s planned revitalization effort for the North Woodbridge area. The town center would include a mix of commercial and residential development served by a muti-modal, four-lane boulevard. Currently, the existing roadway network does not have the ability to provide this service. If the North Woodbridge Town Center were to be constructed today, vehicles would be able to enter or exit the town center directly onto Route 1 or

Route 123, changing localized travel patterns and vehicle demand on the adjacent roads and impacting the intersection delays. **Table 1-3 Future ADT Growth in the Area**

Roadway Name	Limits	ADT		
		2019	2045	Percent Increase
Route 123	Route 1 to I-95	20,000	29,600	48%
Route 1	Opitz Blvd to I-95	41,000	56,500	38%

Source: Kimley Horn, 2020

1.5. Summary

The future traffic demands, and planned revitalization of the North Woodbridge area has created the need to extend Marina Way to mitigate traffic delays across multiple intersections in the area. The purpose of the proposed project improvements will be to provide an adequate multi-modal transportation system that:

- Provides safe pedestrian accessibility and connectivity in the North Woodbridge area.
- Provides traffic congestion relief for traffic demand on local roads and intersections.
- Provides access to local businesses and homes in the North Woodbridge area and is consistent with existing and planned local development.

Section 2 – Alternatives Analysis

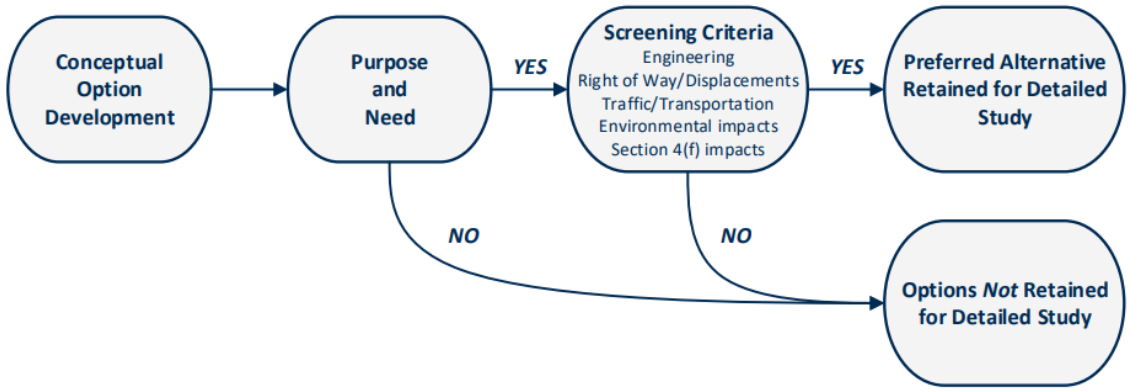
2.1. Introduction

This section details the conceptual roadway alignment options that were developed and reviewed for this project. These options were developed to meet the roadway classification criteria, minimize right-of-way impacts and acquisitions, minimize impacts to future development, maintain consistency with the transportation plan, and reduce or eliminate impacts to natural resources. There were only two alignment options developed and reviewed because the study area is highly constrained due to existing and proposed development. The section will identify the preliminary options eliminated from further consideration and the No Build and Build Alternative that will be carried forward for detailed study in this Environmental Assessment (EA).

2.2. Options Development and Screening Process

The development and screening process, as represented in **Figure 2-1**, was used to determine which option can adequately address the purpose and need and be carried forward as part of the Preferred Alternative for further analysis in this EA. The following is a brief explanation of the steps involved in the development and screening process used for this project:

Figure 2-1 Options Screening Process



2.2.1. Conceptual Options Development

The County's engineering, traffic, and environmental disciplines used the following planning documents, studies, data, and technical guidance to develop the conceptual options for this project:

- A key element of the North Woodbridge Small Area Plan's Illustrative Plan is providing a connection between Horner Road and Marina Way. This connection is intended to be a main street surrounded by businesses, homes, and walkable streets. The North Woodbridge Small Area Plan's Mobility Plan provides additional details about the proposed termini for the project and the proposed functional classification for the roadway. In addition, the

Aspirational Initiatives component of the Visualize 2045 plan update includes the Marina Way Extended project which is defined as a boulevard with pedestrian facilities on both sides. Please go to **Sections 1.2 and 1.3 of this EA** for additional information about these plans and the proposed typical section for the roadway.

- In June 2023, a wetland delineation was performed to determine the boundaries of the jurisdictional wetlands and other waters of the US within the study area as part of the environmental documentation for the EA. The locations of these features informed the development of conceptual alignment options, and avoidance and minimization of impacts to these resources was considered to the extent practicable. Additional details on the delineation and the waters within the project area can be found in **Section 2.3**.

- A Phase I Archaeological and Historic Architecture survey was conducted for the study area. The study identified any structures eligible for listing of the National Register of Historic Places as well as any potentially eligible archaeology sites in the area. There were no archaeological and historical architectural resources found within or adjacent to the study area.

- A field review and desktop survey were conducted utilizing GIS data from sources such as the US Fish and Wildlife Service (USFWS) National Wetland Inventory data, Federal Emergency Management Agency (FEMA) 100-years floodplain maps, and Virginia Department of Wildlife Resources (DCR) Wildlife Environmental Review Map Service tool. These reviews and surveys were considered when assessing conceptual designs. See **Section 2.2.3.** for a discussion of the environmental and physical constraints that were discovered during these studies.

- The Prince William Transportation Systems – Planning and Design standards were utilized during the development of the options. These standards considered access points, traffic demand, land use developments, and visual aesthetics throughout the corridor.

- In addition to this Project's traffic forecast analysis that identified level of service (LOS) for the Marina Way at Annapolis Way and Route 123 at Horner Road intersections, traffic data from the Route 1 at Route 123 Intersection Analysis that was completed under the STARS program was used for the options' development. The traffic forecasting utilized data from the Prince William County Travel Demand Model (PWCTDM) and considered the adopted North Woodbridge Small Area Plan.

- VDOT previously funded a pre-scoping planning study for SMART SCALE, 'North Woodbridge Mobility Improvements', and considered extending Marina Way with the addition of a roundabout near the Gordon Plaza shopping center. VDOT removed the roundabout because it did not improve traffic operations and had significant ROW costs. The study was not completed due to the project not receiving funding.

2.2.2. Existing Constraints

Several engineering, design, environmental, and development considerations and constraints influenced the development of the options. These considerations are shown in **Figure 2-2** on the following page.

Future Transportation Projects

In addition to the Marina Way Extension project, there are other projects such as the Annapolis Way Extension identified in the County's Mobility Plan as well as funded projects in VDOT's Six-Year Improvement Program that are planned for the North Woodbridge area. The proposed improvements associated with these projects presented several engineering and constructability constraints that restricted the number of and how the preliminary roadway alignment options could traverse the study area. Future projects and proposed improvements within and immediately adjacent to the study area that could restrict the options include:

- Route 1 and Route 123 Interchange Widening – The project includes construction of an interchange at the intersection of Route 1 and Route 123. The project also includes widening Route 1 to six lanes from Mary's Way to Annapolis Way, constructing bridge over CSX railroad to provide new access point to Belmont Bay, and widening Route 123 to six lanes from Annapolis Way to Route 1. This project is programmed in the FY2023-2026 Transportation Improvement Plan (TIP).
- Route 123 widening – The County's Mobility Plan proposes widening Route 123 to six lanes from Route 1 to Annapolis Way. It includes a shared use path along the westbound lanes and a sidewalk along the eastbound lanes.
- Annapolis Way Extension – The project includes the construction of 0.28-mile segment of roadway between existing segments of Annapolis Way to create a connection between Route 1 and Route 123. The project extends between the entrance to the Route 123 Commuter Lot to just west of the Marina Way terminus at Annapolis Way. This project is programmed in the FY2023-2026 TIP.

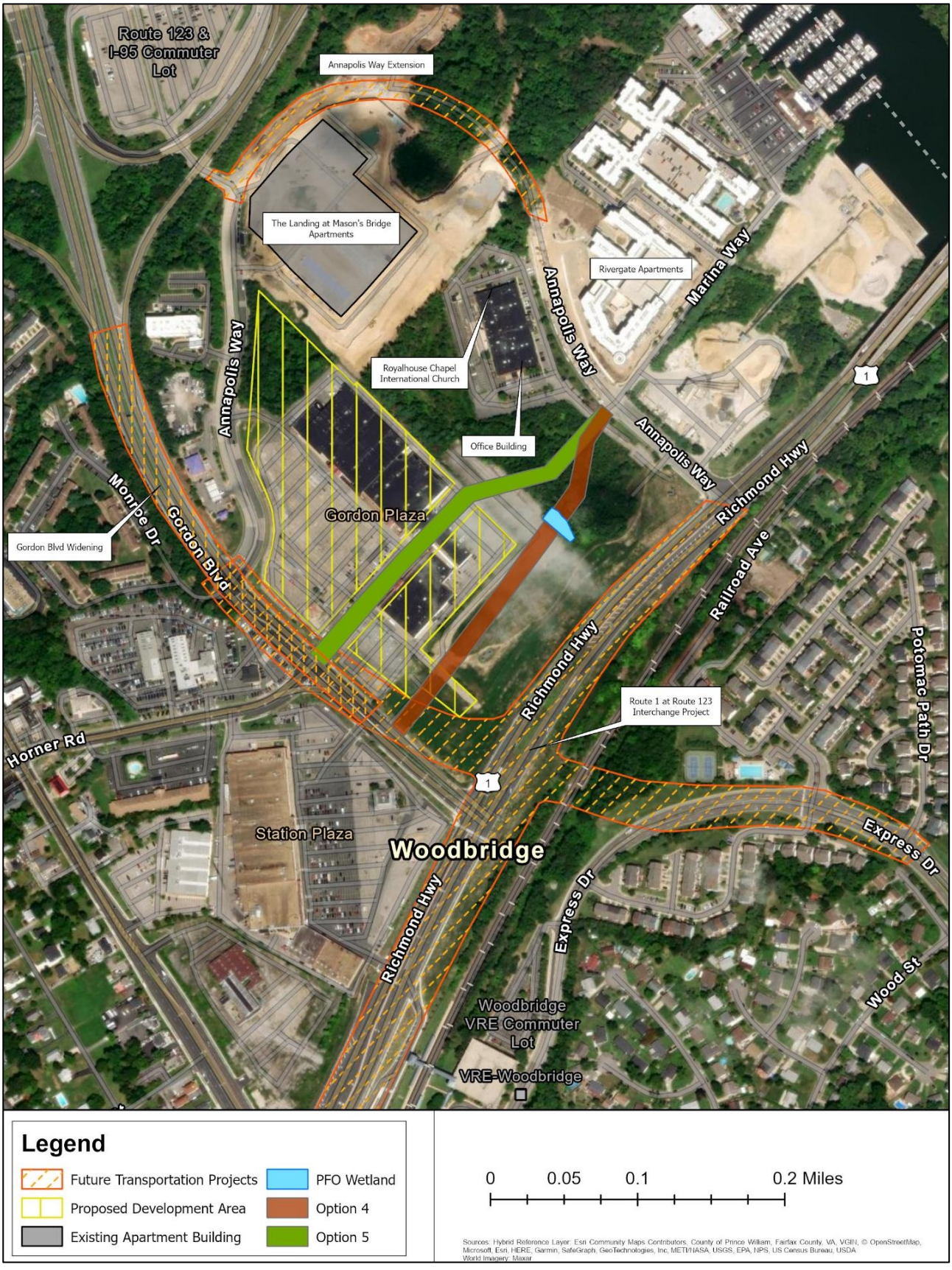
Existing and Planned Development

Some of the physical constraints related to existing and planned development in the study area include the future Gordon Plaza development (i.e., North Woodbridge Town Center), existing businesses and apartment complexes aligning Annapolis Way, and the existing location of the two intersections which heavily controlled the most practical alignment.

Figure 2.2 shows the pending Gordon Plaza development that is in the center portion of the study area. The pending Gordon Plaza development is referred to as the North Woodbridge Town Center in the North Woodbridge Small Area Plan. This future development has recognized the County's desire to build the Marina Way Extension project, and therefore has accommodated for a future roadway alignment – Marina Way Extension. The County's Urban Mixed-use Master Zoning Plan which identified the North Woodbridge Town Center and commercial and residential areas within the surrounding study area, also incorporated the Marina Way Extension project in its illustrative master zoning plan. (County, 2005)

There is the Rivergate apartment complex at the intersection of Annapolis Way and Marina Way and the Landing at Mason's Bridge apartment complex is located along Annapolis Way and can be accessed from Annapolis Way where it terminates at the Route 123 Commuter Lot. Also, there is an office building with an outside eating area located along the west side of Annapolis Way with two separate access points to Annapolis Way. Any roadway and pedestrian improvements along Annapolis Way would require additional ROW acquisition from these apartment complexes and businesses along Annapolis Way as well as potential altering their existing access to the street.

Figure 2-2: Options Analysis Constraints



Environmental and Physical Constraints

There is forested land and a forested wetland in the northern portion of the study area. Impacting the forests may require additional coordination with the US Fish and Wildlife Service (USFWS) regarding potential impacts to the endangered Northern long-eared bat and proposed endangered tri-colored bat. Impacts to these federal threatened and endangered (T&E) bat species habitats may require time-of-year restrictions to be implemented for the project which could potentially cause delays which leads to increased project costs. Also, there is a forested wetland in the northern portion of the study area. Impacts to wetlands require permitting and implementing of additional avoidance and minimization measures into the design to reduce or avoid impacts. This change to schedule and design, as well as the addition of the wetland mitigation cost, adds to overall project costs. A field review verified the presence of the Landing at Mason's Bridge, which is under construction, and the Royalhouse Chapel International Church at the terminus on Annapolis Way. Constructing the roadway within 500 feet of the new apartment complex and church would require additional traffic and noise studies and additional remediation per FHWA guidance.

All of the existing constraints identified were avoided to the maximum extent possible to reduce project costs, stakeholder coordination, and schedule.

2.3. Options Not Retained for Analysis

A Basis of Elimination for the options eliminated from additional analysis is provided in **Table 2-1**. The Basis of Elimination will discuss why the options were eliminated based on the constraints and considerations identified above and why the options did not adequately address the purpose and need.

Table 2-1: Options Eliminated from Detailed Study

Options	Basis for Elimination
Transportation System Management (TSM) Option	TSM strategies consist of actions that increase the efficiency of existing facilities; they are actions that increase the number of vehicle trips a facility can carry without increasing the number of through lanes. Examples of TSM strategies include: ramp metering, auxiliary lanes, turning lanes, reversible lanes, and traffic signal coordination. TSM also encourages automobile, public, and private transit, ridesharing programs, and bicycle and pedestrian improvements as elements of a unified urban transportation system. Modal options integrate multiple forms of transportation modes, such as pedestrian, bicycle, automobile, rail, and transit. This option doesn't address the purpose and need and was eliminated from further consideration.
Mass Transit Option	Per guidance from FHWA, the Mass Transit Option should be considered on all major projects that have a cost greater than $500,000. The anticipated cos of this project is $25.3 million. This is not considered a major project and therefore a Mass Transit Option was not developed.

Options	Basis for Elimination
Intersection Improvements Options	
Intersection Options	In addition to the roadway alignment options, two intersection options were developed. The Route 1 at Annapolis Way Intersection option considered short term improvements to accommodate future traffic demand. The intersection option provided additional queuing lengths for the turn lanes. It was determined that this option did not meet the purpose and need for the project. The option didn't provide a connection between Annapolis Way and Route 123, it conflicted with future planned transportation improvements in the area, and there were conflicts with pedestrian mobility and access at the intersection. Short term improvements in the Route 123 and Horner Road Intersection option were also considered to accommodate future traffic demand. The improvements associated with this option included extending the turn lanes for added que lengths. It was determined that this option did not meet the purpose and need for the project. The option didn't provide a connection between Annapolis Way and Route 123 and it conflicted with future planned transportation improvements in the area. Both intersection options were eliminated from further analysis.
Roadway Alignment Options	
Southern Roadway Alignment	This option provides a connection from the Marina Way at Annapolis Way intersection to Route 123. This four-lane roadway alignment option would be located on the vacant property behind the Gordon Plaza development (**Figure 2-3**). Although this option avoids the businesses at Gordon Plaza, it directly impacts a forested wetland, potential T&E species habitat, and impacts a portion of the proposed development area shown in the illustrative Gordon Plaza development (i.e., North Woodbridge Small Area Plan). In addition, due to engineering constraints associated with shifting the southern portion of the roadway alignment, this option would require a new intersection with Route 123. This would create major access management issues and cause inadequate full access intersection spacing from both Horner Road and Route 123. This would in turn create more congestion, present significant safety concerns, and deteriorate traffic operations within this vicinity. In addition, this option would directly impact the design of the future Route 1 at Route 123 intersection widening. Because of these issues, this option does not meet the purpose and need of the project.

2.4. Alternatives Carried Forward

2.4.1. No Build Alternative

Description. The No Build Alternative will be carried forward into the EA. It will provide a baseline for comparison against the Build Alternative in the NEPA analysis. The No Build Alternative assumes the Marina Way Extension roadway and associated improvements are not constructed but considers proposed development and transportation projects in the area will continue as planned. These projects include:

- North Woodbridge Town Center
- Annapolis Way Extension
- Route 1 and Route 123 Interchange
- Route 123 widening

Ability to Meet Needs

The No Build Alternative does not meet the purpose and need of this project. This alternative does not provide the roadway between Annapolis Way and Route 123 to manage the traffic expected from the County's planned revitalization effort in the area. The No Build Alternative would fail to achieve the goals of the North Woodbridge Small Area Plan and objectives under the "Bring Jobs and Housing Closer Together" initiative in NCR TRB's Visualize 2045.

2.4.2. Build Alternative – Preferred Alternative (Marina Way Extension)

Description. The Preferred Alternative assumes a 0.26-mile extension of Marina Way as described below in the Typical Section.

Typical Section. The Preferred Alternative typical section is classified as an Urban Minor Collector (GS-7) geometric standard. It would be a four-lane median-divided roadway with curb and gutter, a 4-foot buffer, and 5-foot-wide sidewalks on both sides of the road. Lane widths will be 11 feet wide with turn lanes present at the Route 123 intersection and main entrances into Gordon Plaza where the future Home Depot and Aldi grocery store is located. (Figure 2-2) The proposed ROW is set at 1 foot behind the sidewalk with County building setback requirements 20 feet from the ROW. The proposed raised grass median will be 15 feet in width and will transition down to 4 feet at intersections where turn lanes are needed. The horizontal alignment of the Preferred Alternative, identified as the Marina Way Extension during the options development process, is described below from north to south and shown on **Figure 2-2**. The proposed section would tie into the existing Marina Way at the Annapolis Way intersection and continue south towards the vacant parcel behind the Gordon Plaza development on new alignment.

Alignment. The horizontal alignment of the Preferred Alternative, which includes the Marina Way Extension roadway alignment, is described below, from north to south:

- The proposed alignment will connect to the existing Marina Way roadway at Marina Way and Annapolis Way.

- The proposed section between Horner Road and Route 123 Intersection will be constructed on new alignment through the Gordon Plaza. The alignment strategically curves through the Gordon Plaza Development to split the future Home Depot and Aldi grocery store to connect to the existing Horner Road and Route 123 Intersection.
- The alignment will provide a continuous four-lane divided section and continuous 5-foot-wide sidewalks on both sides of the road from Annapolis Way to the Horner Road and Route 123 Intersection. Sharrows have been identified in the Mobility Plan for this section of roadway and will be assessed during the design process. The alignment would require new ROW for the entire proposed section and be required to meet building setback requirements.
- The alignment was designed to meet a 30 MPH design speed and will utilize urban low-speed design characteristics making it full crown for the entire corridor.
- The reverse curve is set at 355 feet radius which exceeds the minimum geometric design standards to keep the roadway at full crown. This simplifies the cross section of the roadway as well as drainage design and will allow for easier construction.
- Landscaping is anticipated on the raised grass median to implement streetscape aesthetics to this new roadway. Low-growth vegetation or ground cover will also be installed within the buffer strip to add to this streetscape appeal.
- There would be new access provided for the business park, including the church, directly to Annapolis Way. The current access for the business park uses a dead-end street on the southside of the Marina Way and Annapolis Way intersection to access Annapolis Way. This access point would be closed off as part of the project as it would be an access management safety concern once Marina Way extension is completed. In addition, full access would become only partial access if it were to remain open. Therefore, a new full access entrance was proposed further north to retain full access to Annapolis Way for this property owner.

Intersections. The intersection improvements include a four-way stop controlled at the Marina Way and Annapolis Way intersection, and a signal rebuild (including new pedestrian crossings) Marina Way Extension, Horner Road, and Route 123 intersection.

Right of Way Impacts. Most of the proposed alignment will require ROW acquisitions given that the four-lane median divided roadway will be primarily on new alignment through the middle of the Gordon Plaza development.

Drainage Design*.* Drainage and Stormwater Management on this project will consist of water quality facilities, retention, and erosion control measures. The design will meet applicable VDOT and County requirements but will seek to minimize construction costs, ROW impacts, and long-term maintenance costs. A stormwater pond is anticipated on the northern end of the project in the existing green space that is available. The design will also seek to maximize the use of nutrient credits to meet water quality requirements and will include best management practices (BMPs) at each outfall to meet water quantity requirements as well.

Project Costs. The anticipated cost for the project is estimated at $25,310,279. This is the amount that is programmed in the National Capital Region TPB FY 2023-2026 Transportation Improvement Program to design, acquire ROW, and construct the project.

Ability of the Preferred Alternative to Meet Needs

The Preferred Alternative supports the goals of the TPB's Visualize 2045 Aspirational Initiatives. It provides the connection between Annapolis Way to Horner Road with a four-lane divided roadway and associated pedestrian facilities. It also allows residents at the Viridium and The Landing at Mason's Bridge apartment complexes, as well as other visitors to the North Woodbridge area, pedestrian and vehicular access to the future North Woodbridge Town Center. The Preferred Alternative allows for these residents to have safe, unrestricted access to the businesses and VRE station to the south of the study area. The Preferred Alternative provides the ability for the residents of North Woodbridge to be closer to their jobs and frequented visited areas; therefore, it supports the goals of the Visualize 2045 Aspirational Initiatives.

The North Woodbridge Small Area Plan's Mobility Plan identified the need for a future "Woodbridge Pedestrian and Bicycle Loop". The Loop includes the preferred trail connection of the Potomac Heritage National Scenic Trail (PHNST) that would provide the trails connection to the waterfront of the Occoquan River. It also identifies the need for a pedestrian network which includes constructing sidewalks on both sides of all streets and including high-visibility crosswalks at appropriate intersections in the North Woodbridge area, and a proposed pedestrian bridge crossing from the Woodbridge VRE to the west side of Route 1 allowing for safer pedestrian access between the proposed Woodbridge Town Center and the VRE station. The Preferred Alternative includes five-foot sidewalks along each side of the roadway. It also provides a connection to the existing sidewalks along Annapolis Way as well as a connection to the sidewalks located along Route 123 at Horner Road.

The 2020 Marina Way Extension Traffic Analysis indicates that most of the intersections will be at a LOS D or worse during either the AM or PM peak hour by the year 2030 when the North Woodbridge Town Center opens. The Annapolis Way at Route 123 and Horner Road at Route 123 will be at LOS F in the am peak hour, severe congestion. The Preferred Alternative reduces traffic delays across multiple intersections, including critical segments and intersection of Route 1 and Route 123, by providing additional access points within the proposed North Woodbridge Town Center area as well as to improve safe pedestrian accessibility and connectivity. **Table 2-3** shows the 2030 Level of Service (LOS) for the intersections for the No Build and Build conditions. The 2030 condition assumes that the future Gordon Plaza development (i.e., North Woodbridge Town Center) is open.

Table 2-3: Preferred Alternative Level of Service for Intersections

Intersection	2030 No Build LOS		2030 Preferred Alternative LOS	
	AM Peak	PM Peak	AM Peak	PM Peak
Route 1 and Annapolis Way	C	D	B	C
Route 1 and Route 123	E	D	E	D
Horner Road and Route 123	F	F	E	D
Annapolis Way and Route 123	F	C	D	B

The following is some additional analysis for the intersections identified in Table 2-3.

Route 1 and Annapolis Way intersection – During the AM and PM peak hours, vehicles are using Preferred Alternative to access Route 1 without traveling onto Route 123, helping to reduce the delays at all other intersections in the study area, including Route 1 and Route 123.

Route 1 and Route 123 intersection – During the AM and PM peak hours, the overall intersection and approach delays improve with the Preferred Alternative. Specifically, during the AM peak hour, Route 1 northbound through movement delay is reduced from 60 seconds to 36 seconds and the southbound through movement delay is reduced from 80 seconds to 60 seconds.

Horner Road and Route 123 intersection – For the AM peak hour, the overall intersection and approach delays for all movements are reduced. The Route 123 eastbound delay decreases by approximately 20 seconds and the Horner Road southbound delay decreases by 10 seconds because vehicles are using the Preferred Alternative and Annapolis Way to directly access Route 1. This reduces demand for these approaches, which in turn reduces approach delays. During the PM peak hour, overall intersection and Route 123 approach delays remain similar between the No Build and the Preferred Alternative conditions. This indicates the intersection is under capacity and the baseline demands can be processed without capacity improvements (i.e., turn lanes).

Route 123 and Annapolis Way intersection – During the AM peak hour, the overall intersection delay is reduced by 20 seconds. The PM peak hour delays are nominally reduced. Little to no changes in delay indicates that the intersection is under capacity and the Build traffic conditions can be processed without adding turn lanes.

A summary of the traffic analysis indicates that the Preferred Alternative minimizes vehicle delays of the intersections within the study area because it provides additional access points into and out of the future North Woodbridge Town Center. The additional access points allow for a distribution of traffic demands across multiple intersections which alleviates focused congestion onto overburdened intersections along Route 123 and Route 1.

Section 3 – Environmental Consequences

3.1. Overview of Environmental Issues

This section describes the affected environment and potential direct, indirect, and cumulative environmental consequences of the proposed project. Potential direct environmental impacts are described and estimated based on the limits of disturbance (LOD) of the Preferred Alternative described in Section 2. The LOD consists of the proposed roadway footprint and associated infrastructure as well as the areas required for construction, including but not limited to construction access; grading (cut/fill); temporary and permanent erosion and sediment control and stormwater management measures; landscaping, and signage and lighting.

Table 3-1 summarizes environmental issues and their relevance to the project. Table 3-2 quantifies and compares the impacts between the No Build and Preferred Alternative. Issues that are pertinent to the project's study corridor are discussed further following the tables. For resources that are either not impacted or that do not have a reasonable possibility for individually or cumulatively significant environmental impacts, no further discussion is required. The environmental data and findings presented herein were gathered from federal, state, and local agencies; previous area studies; existing literature and websites; aerial photography; geographic information system (GIS) databases; and site visits to the project's study corridor. Additional information about data and/or studies conducted for the environmental analysis is provided in the technical reports listed in the Table of Contents of this Environmental Assessment (EA).

Table 3-2 Environmental Issues

Resources/Issue	Comments
Land Use & Socioeconomics	In the 2005 North Woodbridge Urban Mixed Use Master Zoning Plan, the County has designated the entire North Woodbridge area as current and future mixed use (i.e., commercial and residential). The plan identifies the future North Woodbridge Town Center to be constructed in the center of the study area where the Gordon Plaza Shopping Center is located. The study area is surrounded by the Woodbridge Square, Station Plaza, Woodbridge Center, and Potomac Plaza commercial areas. The central portion of the study area consists of the Gordon Plaza Shopping Mall. There are businesses immediately adjacent to the southern and northern portions of the study area as well as two apartment complexes located just north of the study area. The Preferred Alternative is expected to provide improved access to the future North Woodbridge Town Center as well as improve pedestrian connectivity and traffic along the local roadway network. According to the 2022 American Community Survey (ACS) and 2020 Decennial census data, the population growth of the study area has outpaced the growth of the County by 11.6% (32.7% and 21.1%,

Resources/Issue	Comments
	respectively). The population of the County is expected to grow another 51.7% from 2030 to 2050. See **Section 3.2.** for more information**.**
Right of Way/Relocations	The No Build Alternative requires no right of way (ROW) acquisition and therefore requires no relocations of residences, businesses, or nonprofit organizations. The Preferred Alternative requires no relocations; however. acquisition of ROW from five parcels would be required to construct the project. See **Section 3.2.5**.
Air Quality	The proposed improvements were assessed for potential air quality impacts and compliance with applicable air quality regulations and requirements. All models, methods/protocols and assumptions applied in modeling and analyses were made consistent with those provided or specified in the VDOT Resource Document. The assessment indicates that the project would meet all applicable air quality requirements of the National Environmental Policy Act (NEPA) and federal and state transportation conformity regulations. As such, the project will not cause or contribute to a new violation of the NAAQS established by EPA. For more information, see **Section 3.3**.
Noise	The apartment complexes to the immediate north of the study area are subject to FHWA Noise Abatement Criteria (NAC), Category B for residential land use. There are three common noise environments (CNE) within the study area. The noise-sensitive receptors at these locations are not predicted to be exposed to 2023 traffic-noise levels that approach or exceed the applicable NAC impact threshold. Also, the Preferred Alternative traffic-noise levels by the year 2050 are predicted to be below the applicable NAC threshold for all locations. See **Section 3.4** for more information.
Water Quality	The Occoquan River, located approximately 1,150 linear feet northeast of the project's study area, is listed as impaired for aquatic life, fish consumption, and open water uses on the Virginia Department of Environmental Quality's (VDEQ's) Final 2022 305(b)/303(d) Water Quality Assessment Integrated Report (VDEQ, 2022). The impairment causes include insufficient dissolved oxygen and polychlorinated biphenyl (PCB) in fish tissues. This segment is included in the *Chesapeake Bay TMDL* and the *Tidal Potomac River PCB TMDL* Plans. Runoff from the study area drains into the Occoquan River, which flows into the Potomac River approximately 5 miles southeast of the project. The construction of the Preferred Alternative will increase impervious surface area and stormwater runoff volumes into impaired surface waters. Potential short-term impacts during construction include increased sedimentation and turbidity downstream, and possible spills

Resources/Issue	Comments
	or non-point source pollutants entering groundwater or surface water through storm runoff. VDOT's practice is to maintain both water quality and quantity post-development equal to or better than pre-development. There are no EPA-designated sole source aquifers within 1.0 mile of the project site. A scoping response received from the VDH indicated that there would not be any apparent impacts to public drinking water sources because of the proposed project (VDH, 2024). No further discussion is warranted in the EA. Under Prince William County's Chesapeake Bay Preservation Ordinance, public roads and their associated structures are conditionally exempt from regulation. Given the exemption for public roads, if the necessary requirements are followed, the proposed project would be consistent with the Chesapeake Bay Preservation Act and enabling state regulations. See more information in **Section 3.6**.
Parks and Recreation	The project corridor was examined for any existing publicly owned parks, recreation areas, wildlife and waterfowl refuges, and open-space easements, including those associated with public schools. No publicly owned parks are present within or immediately adjacent to the LOD. As part of the project scoping and environmental analysis, it was determined that this action does not have the potential for impacts to this resource. No further discussion is included in the document.
Section 4(f)	Use of park and recreation lands, wildlife and waterfowl refuges, and historic sites is subject to the requirements set forth in Section 4(f) of the US Department of Transportation Act of 1966. The project would not require use of land from any Section 4(f) properties. No further discussion is included in the document.
Sections 6(f)	Properties that were acquired or improved with the use of Land and Water Conservation Funds are subject to the requirements of Section 6(f) of the Land and Water Conservation Fund Act of 1965. The project would not require conversion of land from any Section 6(f) properties. No further discussion is included in the document.
Floodplains	The Preferred Alternative would have no impact of the 100-year FEMA floodplain that is associated with the Occoquan River, however ROW for the proposed alignment is within 1000 ft of the 100-year floodplain. Per Executive Order 11988, and the amendments including in Executive Order 13690 and VDOT roadway design standards, effects on floodplains would be minimized. There would be no encroachments on Federal Emergency Management Agency (FEMA) designated floodplains because

Resources/Issue	Comments
	of the Preferred Alternative. The identification of FEMA 100-year floodplains is included on **Section 3.6.**
Waters of the US (WOUS), including Wetlands and anticipated permits	The study area is located within the Middle Potomac-Anacostia-Occoquan 8-digit hydrologic unit code (HUC) boundaries (HUC 02070010). Approximately 0.64 acre of wetlands, comprised of 0.42 acre of palustrine forested wetlands and 0.22 acre of palustrine emergent wetlands, are within the Study area. There would be no stream or wetland impacts resulting from the Preferred Alternative. See **Section 3.6** for more details.
Agricultural and Forestal Districts, Prime Farmland and Soils	There are no agricultural or forestal districts within the study area. Land within the LOD is not currently in agricultural use. There is no further discussion in this document.
Threatened and Endangered Species	Review of the Virginia Department of Wildlife Resources (DWR) Virginia Fish and Wildlife Information Service (VaFWIS) database and the US Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) databases were completed to determine if species have been recorded or have the potential to occur within the vicinity of the study area. Details on wildlife and habitat that were observed and/or have the potential to occur within the study area are described in **Section 3.7**. Additionally, forested communities within the study area were evaluated and classified according to The Natural Communities of Virginia: Ecological Groups and Community Types publication from the Virginia Department of Conservation and Recreation (VDCR), Division of Natural Heritage, Natural Heritage Technical Report 17-07 dated April 2017.
Cultural Resources	A Phase I cultural resources study indicated there was no historic architecture or archaeological *sites identified with the Area of Potential Effect (APE). The study presented the results of an archaeological survey and indicated that t*here were no archaeological sites identified and no further testing recommended. The Department of Historic Resources (DHR) issued a "No Historic Properties Affected" finding under Section 106 of the National Historic Preservation Act (NHPA). **Section 3.8** has additional information about cultural resources study conducted for the project.
Pedestrian and Bicycle Connectivity	There is a network of pedestrian facilities (i.e., sidewalks) and shared use paths (SUPs) within and adjacent to the study area. Also, according to the 2023 Countywide Trails Plan, there are planned bike lanes, SUPs, and sharrows lanes within and immediately adjacent to the study area. The No Build Alternative would not impact the existing or planned pedestrian facilities and SUPs. Although it would limit future bike connectivity in the area because it can't accommodate the proposed

Resources/Issue	Comments
	sharrows lanes along the Marina Way Extension. The Preferred Alternative would not impact existing and future pedestrian facilities or SUPs and would include the sharrows lanes as they are identified in the North Woodbridge Mobility Plan and 2023 Countywide Trails Plan. There would be some minor, short-term impacts to the pedestrian facilities during construction of this alternative.
Hazardous Materials	A Phase I Environmental Site Assessment (ESA) was performed for the study area in accordance with the American Society of Testing and Materials (ASTM) Standard Practice for the Phase I Environmental Site Assessment Process (ASTM Designation: E1527-21) and the United States Environmental Protection Agency Standard Practice for All Appropriate Inquiries (AAI) (40 CFR Part 312). The results of the Phase I ESA indicate that one recognized environmental condition (REC), the former Gordon Plaza Dry Cleaner, located at 13276 Gordon Boulevard, is within the study area. No Controlled or Historical Recognized Environmental Conditions (CRECs and HRECs, respectively) were identified in association with the former Gordon Plaza Dry Cleaner site. The Phase I ESA recommended collecting and reviewing all available information regarding the observed groundwater monitoring wells to assess if the former drycleaning operation has negatively impacted groundwater underlying the property. The owner of the property has placed the property into the Virginia Department of Environmental Quality's Voluntary Remediation Program. Cleanup and disposal of solid waste (if necessary) by a waste management firm would be completed at time of purchase of the property. See **Section 3.10.8.** for more information.

Table 3-3 Summary of Impacts

Category	Build	No Build
Limits of Disturbance (acres)	3.9	0
Residential Relocations	0	0
Business Relocations	0	0
School Relocations	0	0

Category	Build	No Build
Non-Profit Business (tenant)	0	0
Other Community Facilities	0	0
Section 4(f) Properties	0	0
Section 6(f) Properties	0	0
Impacted Noise Receptors	0	0
Wetland Impacts (acres)	0	0
Stream impacts (linear feet)	0	0
Floodplains (acres)	0	0
Farmland Displaced (acres)	0	0
Forest Impacts (acres)	1.1	0
Threatened and Endangered Species (acres of habitat)	1.1	0
Hazardous Materials Sites	1	0
Historic Properties	0	0

3.2. Land Use & Socioeconomics

The Project proposes a connection between existing Marina Way and Horner Road in North Woodbridge, VA. The Project is located within Prince William County, at the Gordon Plaza shopping center located between Gordon Boulevard (Route 123) and Annapolis Way. The study area is positioned northwest of Jefferson-Davis Highway (Route 1) and Route 123 intersection and east of the I-95/Route 123 interchange. The Project is near the Route 123 Commuter Lot and Occoquan River Marina, as well as the Woodbridge VRE Station on the other side of Route 1 (**Figure 3-1**). The area surrounding the study area consists of mostly residential and commercial developments. There are no agricultural lands within or immediately around the study area. The North Woodbridge area is expected to experience significant growth and development.

3.2.1. Communities and Neighborhoods

In the 2005 North Woodbridge Urban Mixed Use Master Zoning Plan, the County identified North Woodbridge as a future mixed-use area. Based on Google aerial imagery, the study area is partially within the Gordon Plaza Shopping Mall off Gordon Blvd and extends into a forested area northeast of Gordon Plaza. The area surrounding the study area contains multiple commercial areas - Woodbridge Square, Station Plaza, Woodbridge Center, and Potomac Plaza. These are the local shopping centers within Census Tract (CT) 9002.01. These shopping centers are all located along Gordon Blvd or Route 1. (**Figure 3-2**).

Marumsco Village is a community of single-family homes that is partially within CT 9002.01 bounded by Horner Road and Marumsco Creek. The community is located southwest of the study area, right off Occoquan Road. Additionally, Greenwich Hill and Occoquan Village are communities of townhomes located near the study area, along Occoquan Road. Rivergate and Viridium are apartment complexes accessed from Marina Way and Annapolis Way northeast of the study area, The Landing at Mason's Bridge apartment complex is under construction and located directly north of the study area.

No Build Alternative

The No Build Alternative assumes the continuation of the North Woodbridge area, but the extension of Marina Way would not be constructed, limiting connectivity between commercial and residential areas. Access to the pending North Woodbridge Town Center would be restricted to Route 1 and Route 123 access points. The merging and diverging traffic to and from the North Woodbridge Town Center would lead to additional traffic congestion and delays on Route 1 and Route 123. This would adversely affect access to the surrounding communities.

Preferred Alternative

The Preferred Alternative provides direct access to the future North Woodbridge Town Center. The purpose of this alternative is to reduce traffic congestion from Routes 1 and 123, provide safe pedestrian connectivity in the area, ensure County – planned and local development, and provide improved access to residential and businesses in the area. The improvements associated with this alternative will have long term beneficial effects on the surrounding communities and neighborhoods in the North Woodbridge area.

Figure 3-1: Study Area

Figure 3-2: Census Tract

3.2.2. Population and Employment

Demographic data for the study area was gathered from the 2022 American Community Survey (ACS) and the Decennial Census. The study area is entirely within CT 9002.1 in Prince William County. CT 9002.1 includes multiple shopping centers in North Woodbridge as well as residential homes. This CT is located immediately southwest of Occoquan River, between I-95 and Route 1. The southwest limits of the CT extend to Occoquan Road and Marumsco Creek.

The population of the County has grown significantly from 1990 to 2020, with an overall increase of 123% during this period (**Table 3-3**). The percent increase in the County's population from 2010 to 2020 was just over 21%. The County experienced the largest increase in population between 2000 and 2010. Data for CT 9002.01 is not available for 1990 and 2000. The population percent increase for CT 9002.01, from 2010 to 2020, is slightly larger than the County's population percent increase during this same time period (**Table 3-3**). Based on the 2022 ACS 1-Year Estimates, 3.3% of the population aged 16 years or older in the County are unemployed.

Table 3-3 Population Over Time

County/Census Tract	1990	2000	2010	2020	Change 1990-2020	Change 2010-2020
Prince William County	215,686	280,813	402,002	482,204	123.6%	21.1%
Census Tract 9002.01	Data unavailable		2,042	2,710	N/A	32.7%

Source: U.S. Census Bureau: 1990, 2000, 2010, 2020; Prince William County 2020 Redistricting Data

Table 3-4 shows the projected population estimates for the County based on data from the Demographics Research Group of the Weldon Cooper Center for Public Service. By 2050, the County is anticipated to grow by an additional 51.7%.

Table 3-4 Population Projections

County	2023	2030	2040	2050	Change 2023-2050
Prince William County	491,693	554,344	645,380	746,076	51.7%

Source: Prince William County Government, 2022; Weldon Cooper Center, 2022

According to the 2020 Decennial Census, the County had a minority population of 281,607, which accounts for more than half the total population. (**Table 3-5**) The CT that encompasses the study area has a minority population of 69.2%. The population of people under 18 years old in the County and CT 9002.1 (26.7% and 23.9% respectively) are both slightly higher than the percentages in the Commonwealth of Virginia (21.9%). Additionally, the population over 65 years of age in the County is 10.5% while the percentage in CT 9002.01 is 7.3. This percentage of the 65 years and over population in both the County and CT is lower than the percentage of the total population of the Commonwealth that is 65 years of age or older.

Table 3-5 Demographics in 2020

County/Census Tract	Total Population	Minorities (%)	Under 18 Years (%)	Over 65 Years (%)
Prince William County	482,204	58.4%	26.7%	10.5%
Census Tract 9002.01	2,710	69.2%	23.9%	7.3%

Source: U.S. Census Bureau 2020 Decennial Census Data

No Build Alternative

The No Build Alternative assumes the continued growth of the North Woodbridge area. It would have no impact on the population growth or employment within the area.

Preferred Alternative

The Preferred Alternative would provide improved access to residential and commercial areas and improve pedestrian connectivity in the area. This alternative would have long term beneficial effects because the improvements associated with this alternative are designed to accommodate the anticipated population and economic growth in the North Woodbridge area.

3.3. Right of Way/Relocations

No Build Alternative

The No Build Alternative does not require ROW acquisition and as a result, does not require relocations and has no direct adverse impacts to residences and businesses.

Preferred Alternative

The Preferred Alternative has no relocations associated with the proposed alignment. Multiple businesses exist in the location of the proposed alignment for Marina Way; however, relocations of these businesses are proposed during construction of the North Woodbridge Plaza. The relocations would occur before the construction of the Preferred Alternative. The relocations are the responsibility of a private developer.

A portion of the proposed alignment will require ROW acquisition due to the roadway being on a new alignment that goes through the existing Gordon Plaza Shopping Center. There will be about 2.5 acres of land acquired for right of way for the proposed alignment. **Figure 3-3** depicts the five parcels from which permanent and/or temporary easements would need to be acquired. As design progresses, additional refinements to the project footprint could occur and the ROW acquisition estimates would be updated.

All efforts would be made to avoid or minimize ROW impacts. The acquisition of ROW would be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Under the law, the purchase price for property acquired would be fair market value as determined by an appraisal prepared by a qualified appraiser.

3.4. Air Quality

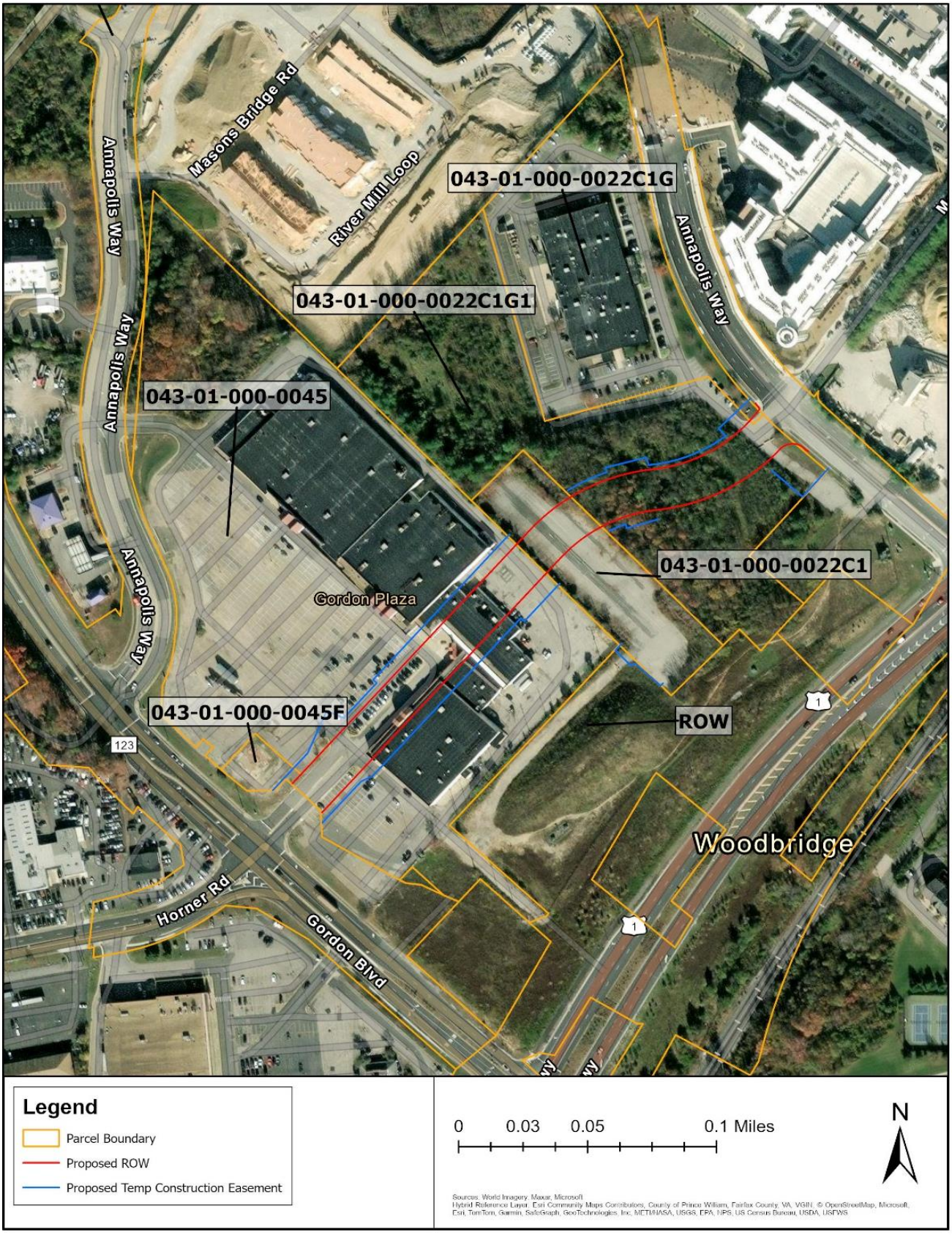
In accordance with NEPA, air quality impacts of transportation improvement projects must be considered at both the regional and local level. The project is in Prince William County, which has been designated by the EPA as nonattainment for the 8-hour ozone NAAQS and attainment for all other NAAQS. The air quality analysis completed for the Preferred Alternative indicates that the project would not cause or contribute to a new violation, increase the frequency or severity of any violation, or delay timely attainment of the NAAQS established by EPA.

The findings for the air quality analysis are summarized below and described in detail in the Air Quality Technical Report included as **Appendix A**.

Carbon Monoxide (CO) Analysis. As the project is in a region that is in attainment of the CO NAAQS, EPA project-level ("hot-spot") transportation conformity requirements do not apply. As only NEPA applies, a project-specific analysis and/or assessment for CO is not needed under the terms of the programmatic agreement between FHWA and VDOT for project-level air quality analyses for CO. As documented in that agreement, which is based on the analysis and information presented in the template Programmatic Agreement and Technical Support Document (TSD) developed in the National Cooperative Highway Research Program (NCHRP) 25- 25 Task 104 study (2020), the weight-of-evidence shows that it may reasonably be concluded that the NAAQS for CO will be met for all projects given:

- Continued implementation of effective emission control technology, increasingly more stringent motor vehicle emission and fuel quality standards implemented over the past few decades by the EPA that have had the combined effect of substantially reducing CO emission rates nationwide, resulting in long-term downward trends in emissions and near-road ambient concentrations of CO despite increasing VMT;

Figure 3-3: Property Boundaries



- Extensive experience in project-specific modeling for CO for a wide variety of project types, configurations and operating conditions in which compliance with the NAAQS established by EPA for CO is readily demonstrated given the substantially reduced CO emission rates, and despite the use of multiple worst-case assumptions for emission and dispersion modeling that have a compounding effect such that emissions and near-road ambient concentrations are substantially over-estimated;
- Extensive experience in programmatic agreements for project-level agreements for CO that establish ever-increasing thresholds for such analyses given the substantially reduced emission rates; and
- The results of worst-case modeling conducted for this PA for typical highway project types, configurations and operating conditions in which compliance with the NAAQS is readily demonstrated, and by a substantial safety margin.

Fine Particulate Matter (PM2.5) Analysis. The project is in an attainment area for PM and therefore is not subject to a PM conformity assessment.

MSAT Analysis. FHWA guidance (2023) states that "…EPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-cancer hazard contributors from the 2011 National Air Toxics Assessment (NATA). These are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter." Following FHWA guidance for projects with low potential impacts based on forecast traffic volumes and other technical criteria, a qualitative assessment of potential MSAT impacts was conducted for this project.

Based on that assessment, best available information indicates that, nationwide, regional levels of MSATs are expected to decrease in the future due to ongoing fleet turnover and the continued implementation of increasingly more stringent emission and fuel quality regulations. Nonetheless, technical shortcomings of emission and dispersion models and uncertain science with respect to health effects effectively limit meaningful or reliable estimates of MSAT emissions and effects of this project at this time. While it is possible that localized increases in MSAT emissions may occur as a result of this project, emissions will likely be lower than present levels in the design year of this project as a result of EPA's national control programs that are projected (in the FHWA 2023 Guidance) to reduce annual MSAT emissions by 76 percent between 2020 and 2060 while VMT are expected to increase on a national level by 31 percent. Although local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

No Build Alternative

The No Build Alternative would not have any impacts to air quality.

Preferred Alternative

The air quality assessment of the Preferred Alternative indicates that the project would meet all applicable air quality requirements of the NEPA and federal and state transportation conformity regulations. As such, the Preferred Alternative will not cause or contribute to a new violation of the NAAQS established by EPA.

Regional Conformity Considerations. Federal conformity requirements, including specifically 40 CFR 93.114 and 40 CFR 93.115, apply as the area in which the project is located is designated as nonattainment for ozone. Accordingly, there must be a currently conforming transportation plan and program at the time of project approval, and the project must come from a conforming plan and program (or otherwise meet criteria specified in 40 CFR 93.109(b)).

As of the date of preparation of this analysis, the project is included in the currently conforming FY 2023-2026 Transportation Improvement Program (TIP) and 2045 Long Range Transportation Plan (LRTP). The LRTP and TIP are developed by the metropolitan planning organization (MPO) for the region, whose members include VDOT (Metropolitan Washington Council of Governments, 2024).

3.5. Noise

The Project's noise analysis details the noise impact assessment for the Existing (2023) condition and the future design-year (2050) of the Preferred Alternative. The No Build Alternative was not evaluated because there are no Section 4(f) resources in the study area and the project is not related to an interstate system. The noise analysis was performed in accordance with current Federal Highway Administration (FHWA) regulations contained in 23 CFR 772 and Virginia Department of Transportation (VDOT) Noise Abatement Policy.

Noise abatement was evaluated to determine if the potential abatement measure satisfies VDOT criteria to be considered warranted, feasible and reasonable. Predicted noise levels in the Design Year 2050 were evaluated for three CNEs using FHWA's Traffic Noise Model (TNM) version 2.5. The CNEs include:

- **CNE A** is located in the north corner of the Marina Way and Annapolis Way intersection. It is comprised entirely of residences and associated areas of exterior use within the Viridium Apartments Woodbridge community. The apartment community consists of a five-story building with exterior ground level outdoor use and balconies. Additionally, a rooftop common area and outdoor pool area are also part of the complex.
- **CNE B** is located north of Annapolis Way and west of Marina Way. It is comprised entirely of residences and associated areas of exterior use within the Rivergate Apartments community. The apartment community consists of a five-story building with exterior ground level outdoor use and balconies. Additionally, a common outdoor area with a pool is also part of the complex.
- **CNE C** is located west of the Marina Way and Annapolis Way intersection. This CNE includes the Royalhouse Chapel International place of worship.

The noise modeling of existing and future design-year noise conditions in the study area was completed using FHWA TNM version 2.5. The geometric modeling of the study area accounted for all relevant terrain features, buildings, and existing and proposed roadway improvements. Traffic data utilized consisted of the projected worst-case loudest-hour traffic volumes. The predicted estimates of existing noise levels are then used as the baseline against which future noise levels are compared and potential noise impacts assessed (**Table 3-7**).

Table 3-7. Predicted Noise Levels

CNE	Land use- Description	Activity Categories	Range of Predicted Exterior & Interior Noise Levels for the Worst Hour (PM)	
			2023 Existing	2050 Build
A	Residential – West of Marina Way, between Annapolis Way and Rivergate Place. Comprised entirely of residences within the Viridium Woodbridge Apartments community.	B	50 – 58	50 - 61
B	Residential – West of Marina Way, north of Rivergate Place. Comprised entirely of residences within the Rivergate Apartments community.	B	50 – 54	50 - 56
C	Institutional – West of Marina Way, south of Annapolis Way. Includes the Royalhouse Chapel International.	D	26 – 26	31 - 31

No Build Alternative

The No Build Alternative would not introduce any new noise generators to the project corridor. This alternative would also not result in any noise impacts.

Preferred Alternative

In summary, noise impact would occur wherever project noise levels are expected to approach within one decibel or exceed 67 dBA Leq at noise-sensitive land uses in Activity Categories B (exterior residential) or approach within one decibel or exceed 52 dBA Leq at noise-sensitive land uses in Activity Category D (interior institutional) during the loudest hour of the day. Noise impact also would occur wherever project noise levels cause a substantial increase over existing noise levels—an increase of 10 dB or more is considered substantial by VDOT.

In the 2023 Existing condition, noise-sensitive receptors are not predicted to be exposed to traffic-noise levels that approach or exceed the applicable NAC impact threshold for all locations. Likewise, in the 2050 Build alternative, traffic-noise levels at noise-sensitive receptors are predicted to be below the applicable NAC threshold for all locations. Additionally, increases in traffic-noise levels are predicted to range between one and seven decibels. Therefore, no impacts due to substantial increases are predicted. Since no noise impact is predicted to occur because of the project, no further analysis is required and noise mitigation would not be warranted.

The *Preliminary Noise Analysis Technical Report* in **Appendix B** provides additional detail on analysis methodology, findings, and abatement considerations.

3.6. Water Resources

Water resources are federally, and state regulated under the federal Clean Water Act (CWA) (33 USC 1251 et seq.) and the Virginia State Water Control Law. Section 404 of the CWA regulates discharges of dredged or fill material into Waters of the United States (WOUS). WOUS is defined as all navigable waters and waters that have been or can be used for interstate or foreign commerce, their tributaries, and any waters that, if impacted, could affect the former. WOUS include surface waters (streams, lakes, bays, etc.) and their associated wetlands (inundated or saturated areas that support vegetation adapted

for life in wet soils). US Army Corps of Engineers (USACE), VDEQ, and Virginia Marine Resource Commission (VMRC) all have permit authority for various activities in, under, and over WOUS in Virginia.

3.6.1. Streams and Wetlands

The project is located within the Potomac-Shenandoah watershed. The major tributaries to this watershed include the Potomac River, S. Fork Shenandoah River, and N. Fork Shenandoah River. The watershed covers 5,702 square miles in portions of Virginia, West Virginia, Maryland, and Pennsylvania. Within the Potomac-Shenandoah major watershed, the project falls within the Middle Potomac-Anacostia-Occoquan 8-digit hydrologic unit code (HUC 02070010) boundary. The entire study area is located within the Belmont Bay-Occoquan River 12-digit HUC watershed boundary (HUC 020700100803), as shown on **Figure 3-4**.

No Build and Preferred Alternatives

No streams or open water bodies were identified within the study area during the WOUS delineation. For this reason, the No build Alternative and Preferred Alternative would not require alteration of any streams or open water. No compensation would be required.

EO 11990, Protection of Wetlands, mandates that each federal agency take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance their natural values. Wetlands are defined by USACE (33 CFR § 328.3[c]) and EPA (40 CFR § 120.2[3]) as:

> *…areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*

The WOUS delineation identified one palustrine forested (PFO) wetland located along the southwest edge of the undeveloped, vegetated area located in the central portion of the study area. The wetland is 0.15 acre and falls outside the LOD for the proposed roadway alignment. The delineated wetland is shown in **Figure 3-5**.

No Build Alternative and Preferred Alternative

The No Build Alternative and Preferred Alternative would have no impact on wetlands.

See **Appendix C** Waters of the US and Wetland Delineation Report for more information.

3.6.2. Water Quality

Impaired Waters

VDEQ's Final 2022 305(b)/303(d) Water Quality Assessment Integrated Report includes impairment designations for the Occoquan River (VDEQ, 2022). The report details the pollutant responsible for the impairment, and the suspected cause and source of the pollutant. All impaired waters in Virginia are placed on a federally mandated 303(d) impaired waters list. Waters that are impaired due to human activities require a plan to restore water quality and associated designated use(s). VDEQ schedules each of these waters for development of a Total Maximum Daily Load (TMDL), which is a reduction plan that defines the limit of a pollutant(s) that a water can receive and still meet water quality standards. A

TMDL Implementation Plan is developed after a TMDL is approved by the EPA. Once fully implemented, the TMDL Implementation Plan would restore the impaired waters and maintain its water quality.

The type of water quality data or parameters collected is determined by the waterbody's classification and corresponding Water Quality Standards. The information gathered from the monitoring stations determines the "use support" status of waterbodies, or how well a waterbody supports its designated uses. The Occoquan River, located approximately 1,150 linear feet northeast of the study area, is currently listed as impaired for aquatic life, fish consumption, and open water uses under 303(d) due to insufficient dissolved oxygen and PCB in fish tissues (Category 4A).

Category 4A indicates "water is impaired or threatened for one or more designated uses but does not require a TMDL because the TMDL for specific pollutant(s) is completed and USEPA approved" (VDEQ, 2022). The Occoquan River is included in the Chesapeake Bay TMDL (Total Suspended Solids, Total Nitrogen, and Total Phosphorus) and the Tidal Potomac River TMDL Implementation Plan (PCBs).

No Build Alternative and Preferred Alternative

The No Build and Preferred Alternatives are not expected to increase bacteria levels within the Occoquan River as sources typically include permitted point sources, sanitary sewer and septic systems, wildlife, and pets. The proposed project would not introduce or cause an increase in any of these sources.

Figure 3-4: Watershed Boundaries

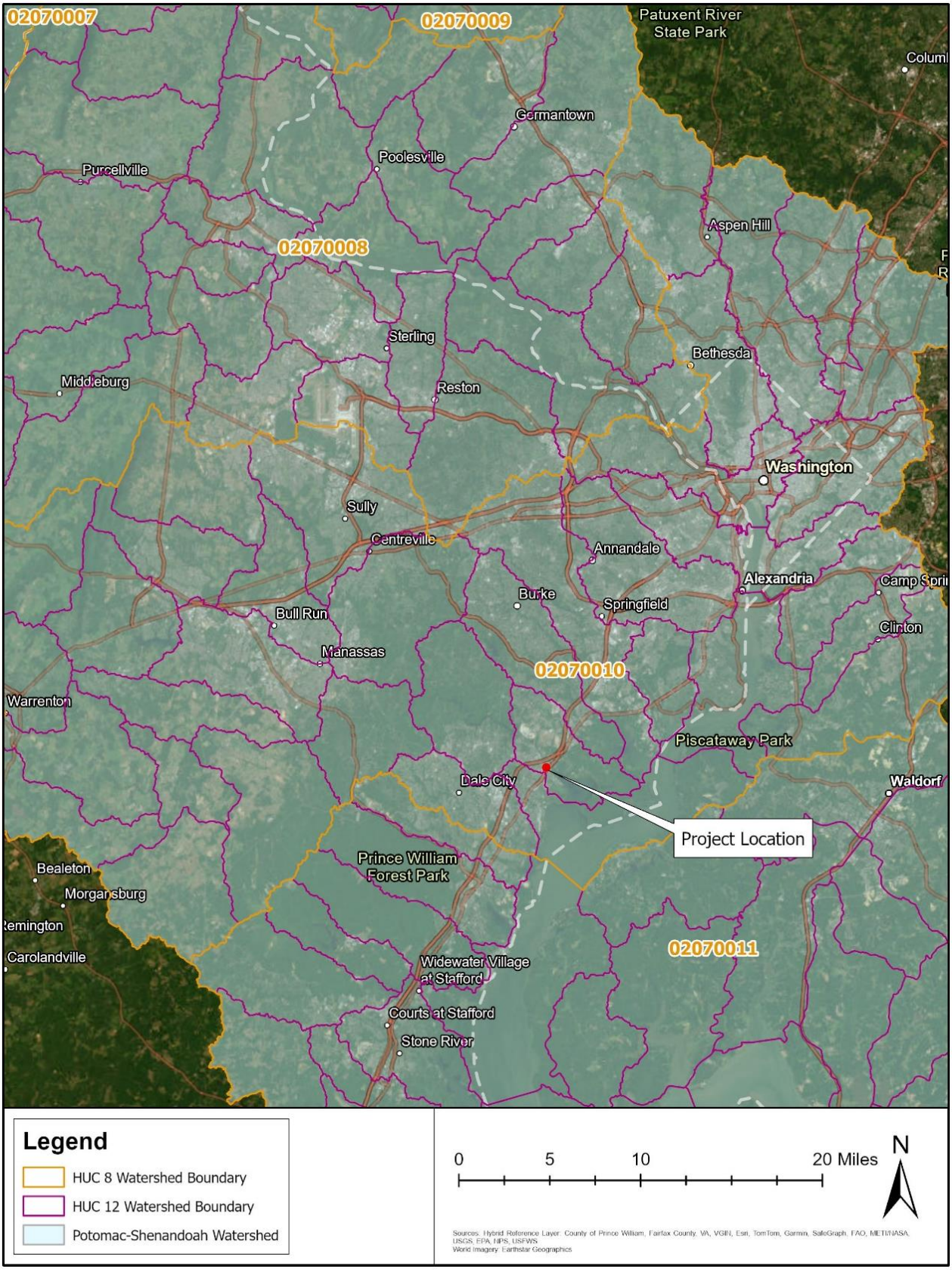


Figure 3-5: Water Resources

Preferred Alternative

The Preferred Alternative may incur short-term impacts relating to runoff from ground disturbing activities during construction. These potential impacts would be minimized with implementation of appropriate erosion and sediment control practices in accordance with the Virginia Erosion and Sediment Control Regulations, the Virginia Stormwater Management Law and regulations, and VDOT's Road and Bridge Specifications. The potential long-term impacts associated with the Preferred Alternative include increases in impervious surfaces and increase in traffic volumes leading to subsequent increases in pollutants washed from the road surface into receiving water bodies. The increases in impervious surface can also potentially increase stormwater flows, thus increasing sedimentation and turbidity problems in downstream waters.

To mitigate potential long-term impacts, the County will maintain both water quality and quantity post-construction equal to or better than preconstruction as outlined in the *Minimum Requirements for the Engineering, Plan Preparation and Implementation of Post Development Stormwater Management Plans, Instructional and Information Report Number: IIM-LD-195.12* (VDOT, 2019). Stormwater management measures, such as detention basins, vegetative controls, and other measures, would be implemented in accordance with federal, state, and local regulations to minimize potential water quality impacts. Also, the implementation of the guidance restricts contractors from discharging contaminants that may affect water quality. The guidance outlines the process the contractor should take in reporting a spill and appropriate actions to contain and remove the contaminant. Additionally, the requirements, and special conditions of any required permits for work in and around surface waters would be incorporated into construction contract documents, so that the contractor would be required to comply with such conditions.

Chesapeake Bay Preservation Act

Excessive nutrients in the Chesapeake Bay and its tidal tributaries promote a number of undesirable water quality conditions, such as excessive algal growth, low dissolved oxygen, and reduced water clarity, which impacts the necessary conditions for healthy aquatic life. The excessive amounts of nutrients (nitrogen and phosphorus) and sediment washing into the Bay from its major tributaries result from agricultural operations, urban and suburban stormwater runoff, wastewater facilities, air pollution, and other sources including onsite septic systems.

Since the 1987 Chesapeake Bay Agreement, EPA, the District of Columbia, and the six states in the Chesapeake Bay watershed have implemented various programs to improve the health of the Chesapeake Bay so that it will meet the requirements of the Clean Water Act. However, despite continuing efforts, the Bay remains significantly impaired, and cleanup plans failed to meet the 2010 deadline for pollutant reductions stipulated in the 2000 Chesapeake Bay Agreement. In addition, the EPA reached a settlement in a 2009 lawsuit filed by Bay advocacy groups claiming that the EPA failed to take adequate measures to protect and restore the Bay.

Virginia's Chesapeake Bay Preservation Act of 1988, as locally implemented and required conformance with performance criteria, protects Prince William County. To protect and improve the quality of waterways, sensitive areas along streams have been designated as Resource Protection Areas (RPAs) and Resource Management Areas (RMAs). RPAs include tidal wetlands, certain nontidal wetlands and tidal shores, and a minimum 100-foot vegetated buffer area located adjacent to and landward of these features and along both sides of any water body with perennial flow. RMAs, which require less stringent

performance criteria, include all remaining areas. RPAs that have been designated by Prince William County are shown in **Figure 3-5**. By managing land uses within these areas, local governments help reduce the water quality impacts of nonpoint source pollution and improve the health of the Chesapeake Bay. The regulation of activities within RMAs and RPAs has been incorporated into the enforceable policies of Virginia's Coastal Zone Management Program.

No Build and Preferred Alternatives

Both the No Build and Preferred Alternatives would not impact RPAs.

3.6.3. Drinking Water and Groundwater

There are no EPA-designated sole source aquifers within 1.0 mile of the project site.

Water and sewer services for the study area are provided by the Prince William County Service Authority. Water is drawn from the Occoquan Reservoir and treated at the Frederick P. Griffith Water Treatment Plant in Fairfax. The Occoquan Reservoir is an approximately 1,700-acre impoundment which forms part of the northern border of Prince William County with Fairfax County. The reservoir regularly supplies water to approximately 40% of Northern Virginia but can supply all of Northern Virginia in an emergency (Prince William Conservation Alliance, 2003). Fairfax Water owns and maintains the dam at the southern boundary of the reservoir, in addition to having protective riparian buffer easements along the entire reservoir in both counties. The reservoir is susceptible to nonpoint source pollution as development occurs in the region. The primary water quality concern for the reservoir is increasing salinity from road salts, water treatment processes, industrial discharge, and consumer products. Other current water quality concerns include endocrine disrupting compounds (EDCs) and per- and poly fluorinated alkyl substances (PFAS), both of which appear to originate from treated wastewater (County Department of Public Works, 2021). The reservoir is approximately 3 miles northwest of the study area.

The study area is located at the eastern edge of the Piedmont Crystalline-rock aquifer, which consists of mostly crystalline metamorphic and igneous rock covered in unconsolidated material called regolith. Groundwater recharge varies significantly due to local precipitation, topography, and the capacity of the land surface to allow water to infiltrate. Most recharge occurs in the areas between streams, where precipitation enters the aquifer through the porous regolith. The water then moves laterally and discharges into nearby streams or depressions during or after precipitation events, with a small portion flowing downward into fractures in the bedrock. Well yields are typically small, and groundwater is generally suitable for drinking, with some localized areas of elevated iron, manganese, and sulfate. Most of the water withdrawn from the aquifer is for domestic and commercial supplies, with the remainder going towards industrial, mining, thermoelectric, and agricultural uses (USGS, 2016).

No Build and Preferred Alternatives

Both the No Build and Preferred Alternative would not impact any drinking water or groundwater in the study area.

3.7. Wildlife and Threatened & Endangered Species

Species that have the potential to occur or have potential habitat within the study area according to the Virginia Department of Wildlife Resources (VDWR) Wildlife Environmental Review Map Service (WERMS) database, the VDCR Natural Heritage Data Explorer database, and the USFWS IPaC database are included in **Table 3**-8. Note that the six federally and state-listed threatened and endangered species or species of concern included in **Table 3-8** are discussed further in Section 3.8.

The USFWS is responsible for listing, protecting, and managing federally listed threatened and endangered species under the Endangered Species Act of 1973, as amended (ESA). The ESA defines an endangered species as one that is in danger of extinction throughout all or in a significant portion of its range. A threatened species is one that is likely to become endangered in the foreseeable future (16 USC 1532).

The results from a query of the USFWS IPaC on-line system in December 2023 identified one federally listed species (northern long-eared bat [Myotis septentrionalis]) and one federally proposed endangered species (tri-colored bat [*Perimyotis subflavus*]) with the potential to occur in the study area (USFWS, 2023). One of the goals of the IPaC system is to streamline the environmental review process associated with Section 7 of the ESA. The official species list also included the monarch butterfly (*Danaus plexippus*) as a candidate species. In addition, the bald eagle (*Haliaeetus leucocephalus*), which is protected by the Bald and Golden Eagle Protection Act (16 USC 669 et seq.), was mentioned in the USFWS IPaC response.

The Commonwealth of Virginia also maintains a database for occurrences of natural heritage resources, which are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations, as well as a database of state endangered or threatened species. The VDCR database identified one state listed endangered species (Brook floater [*Alasmidonta varicosa*]) within the 12-digit HUC (PL-48; Lower Occoquan River-Belmont Bay) containing the study area (DCR, 2024).

The Virginia Department of Wildlife Resources (VDWR) is responsible for listing, protecting, and managing state listed threatened and endangered species. A review of the VDWR database (i.e., WERMS) indicates that neither federally nor state-listed threatened and endangered species have been documented within a two-mile radius of the study area. The VDWR database identified one species (spotted turtle [*Clemmys guttata*]), as a collection concern. Additionally, Occoquan River and Marumsco Creek were identified as anadromous fish use streams, however, both streams are outside of the study area. The WERMS database identified no trout streams in the study area (DWR, 2023).

Table 3-8. Species and/or Habitat That May Occur Within Study Area

Species Common Name	Species Scientific Name	Status	Habitat
Northern long-eared bat[1]	*Myotis septentrionalis*	Federally Listed Endangered and State Endangered	Caves and cave-like structures (hibernacula), forests, trees.

Species Common Name	Species Scientific Name	Status	Habitat
Monarch butterfly[1]	*Danaus plexippus*	Federal Candidate	Abundance of milkweed (Asclepias spp.) for breeding populations; abundance of nectar-producing flowering plants for breeding and migrating populations.
Bald eagle[1,3]	*Haliaeetus leucocephalus*	Not Listed, Protected by Bald and Golden Eagle Protection Act	Nest in tall trees with open canopies near water bodies where they forage.
Brook floater[2]	*Alasmidonta varicosa*	State Listed Endangered	Prefers stable flowing water habitats, small to mid-size creeks and small rivers with gravel substrates, riffles and moderate rapids with or gravel bottoms.
Tri-colored bat[1]	*Perimyotis subflavus*	Federally Proposed Endangered and State Endangered	Caves, mines, road-associated culverts, forests, trees, manmade structures
Spotted turtle[3]	*Clemmys guttata*	Collection Concern	Shallow waterbodies with abundant vegetation, wetlands, flooded fields, woodland streams, pools, and ponds.

[1]USFWS IPaC
[2]VA DCR NHDE
[3]VA DWR WERMS

Information regarding the potential for each of these species to be present within and/or adjacent to the project site is provided below.

3.7.1. Northern Long-eared Bat

The northern long-eared bat (NLEB) may occur within the study area. During the winter, the NLEB occupies caves and mines with constant temperatures, high humidity, and no air currents. Summer habitat for this species consists of living trees or dead snags where the bats roost singly or in colonies under the bark. The primary threat cited for listing the NLEB is white-nose syndrome, an infectious disease caused by the fungus *Pseudogymnoascus destructans*. However, other threats do exist, such as modifications or destruction of hibernacula and forest conversions or modifications.

No Build Alternative

This alternative would have no impact on this species.

Preferred Alternative

The tree removal associated with the Preferred Alternative would disturb potential summer roosting habitat for the NLEB and habitat for the tri-colored bat. Utilizing the USFWS Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat (dated February 2018, amended March 23, 2023), it was determined the Preferred Alternative effect determination for NLEB is “May Affect Likely to Adversely Affect”. The limited tree clearing associated with the Preferred Alternative would be performed outside the April 1st to November 14th TOYR. It was

determined that the Preferred Alternative would have a May Affect, Likely to Adversely Affect the NLEB. See **Appendix D** for more details.

3.7.2. Monarch Butterfly

The monarch butterfly is currently a "Candidate" species and is not yet proposed for listing; however, the USFWS intends to develop a proposed rule to list the monarch butterfly as its priorities allow (85 FR 81813).

Adult monarch butterflies are large and conspicuous, with bright orange wings with black veins, surrounded by a black border with a double row of white spots. The North American populations of monarch butterflies breed throughout the United States and parts of Canada and Mexico and overwinter in Mexico and along the coast of California (USFWS, 2020). Monarch butterflies require healthy and abundant milkweed and other nectar-producing flowers during breeding and migration, and groves of roosting trees with proximity to nectar sources during migration and overwintering.

Primary threats to the North American populations of monarch butterflies include loss and degradation of habitat (from conversion of grasslands to agriculture, widespread use of herbicides, logging or poor management of overwintering sites, urban development, and drought), continued exposure to insecticides, and effects of climate change (USFWS, 2020).

Potential habitat for the monarch butterfly is present within the study area, however habitat conditions are marginal. Potential habitat includes areas of herbaceous vegetation that could potentially support milkweed and other nectar-producing plants. Within the study area, non-forested herbaceous vegetation is limited to maintained medians and ridges around Gordon Plaza which are periodically mown and maintained. There are no known occurrences of the monarch butterfly in the vicinity of the study area (DWR, 2022).

No Build and Preferred Alternatives

These alternatives would have no impact on this species.

3.7.3. Tri-colored Bat

Tri-colored bats are small insect-eating bats. During the winter, tri-colored bats hibernate in caves and abandoned mines. In the southern U.S., they may also roost in culverts and emerge to forage on warmer nights. Spring, summer, and fall habitat for this species consists of forested habitats where they roost among the leaves of live or recently dead deciduous hardwood trees, and occasionally in Spanish moss, pine trees, and human structures. Tri-colored bats exhibit high site fidelity, meaning they are known to return to the same summer roosting and hibernation sites each year. The primary threat facing the tri-colored bat is white-nose syndrome, however, habitat loss and fragmentation due to forest conversions or modifications also contribute to population declines.

No Build Alternative

This alternative would have no impacts on this species.

Preferred Alternative

The limited tree clearing associated with the Preferred Alternative would be performed outside the April 1st to November 14th TOYR. It was determined that the Preferred Alternative would have a May Affect, Not Likely to Adversely Affect the tri-colored bat.

3.7.4. Brook Floater

The brook floater is a small to medium sized, elliptically shaped mussel which inhabits clean, gently flowing streams along the U.S. East coast. They are sensitive to high water flows and require substrates which allow them to anchor to the stream bottom, such as gravel or sandy shoals, but are not usually found in very slow flow conditions. The greatest threat to the species results from wastewater and effluent from domestic, urban, agricultural, and forestry sources. Additional threats to the species include habitat degradation, residential development, and predation. Brook floaters are particularly vulnerable to pollution, competition with invasive species such as the Zebra Mussel, and changes to temperature and precipitation patterns due to climate change.

No streams were identified in the study area; therefore, the species is not likely to be present.

No Build and Preferred Alternatives

These alternatives would have no impact on this species.

3.7.5. Spotted Turtle

The spotted turtle is a small semi-aquatic turtle with yellow dots on a dark shell. They are found throughout the U.S. east coast and Great Lakes region, favoring shallow aquatic habitats with abundant vegetation, including wetlands, flooded fields, and woodland streams and ponds. Individuals, particularly males, will wander across land between wetlands within a home range of one to eight acres. They are omnivorous, consuming other animals such as worms, insects, amphibian eggs, mollusks, and crustaceans in addition to aquatic vegetation and algae. Spotted turtles overwinter in muddy wetland bottoms, emerging in early spring. Females nest in open, sunny locations with moist, well-drained soils until their eggs hatch in August or September. Spotted turtle populations are threatened by collection for the pet trade, predation, habitat fragmentation and loss, pollution, and declining water quality.

Due to the presence of wetlands and the proximity to nearby water bodies, habitat for the spotted turtle may be present in the study area.

No Build and Preferred Alternatives

These alternatives would have no impact on this species.

3.7.6. Bald Eagle

The bald eagle is not federally listed as threatened or endangered but is nevertheless protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 669 et seq). Therefore, it is often included, as here, in discussions of threatened and endangered species. In Virginia, bald eagles are mostly found along the James, Rappahannock, and Potomac Rivers. This species builds nests in tall hardwood trees with open

canopies near water bodies, where they forage. The USFWS recommends a buffer of 660 feet around bald eagle nests for proposed clearing, construction, and landscaping activities (USFWS, 2007).

There are no bald eagle concentration areas in the study area (USFWS, 2023) and the nearest known bald eagle nest is approximately 1.5 miles from the project site (Center for Conservation Biology, 2024).

No Build and Preferred Alternatives

These alternatives would have no impact on this species.

3.8. Cultural Resources

The *Phase IA Archaeological Reconnaissance Survey and Historic Architecture Assessment, Marina Way Extension Project, Prince William County, Virginia (July 2023)* report was prepared for the project. The study area for the report measures 18.7 acres and is located between Route 123 on the west, and Route 1 on the East; the 18.7 acres are considered the APE. The intention of the survey and assessment was to determine the effect of the proposed work on historic properties per Virginia Department of Historic Resources (DHR) guidelines. The results of the survey and assessment indicated that the wooded area located in the central portion of the APE has moderate potential for archaeological resources. This portion of the APE was tested systematically per DHR Guidelines, with shovel test pits (STPs) excavated at intervals of 50 ft (15m) throughout the wooded area. Areas that exhibited excessive prior disturbance, slope greater than 20 percent, or standing water were not recommended for subsurface testing, but were visually inspected. The testable area totaled approximately 3.45 acres. The report also indicated that there is one previously identified aboveground resource within the APE, Gordon Plaza (076-6114). According to the Virginia Cultural Resources Information System (VCRIS), the resource has been recommended not eligible for listing in the NRHP.

No Build Alternative

These alternatives would have no impact on cultural resources.

Preferred Alternative

In response to the recommendation identified in the Phase IA report and concurrence on the recommendation from DHR, the *Phase IB Archaeological Survey, Marina Way Extension Project, Prince William County, Virginia (February 2024)* report was prepared for the project. The criteria established for significance or potential significance established in 36 CFR 60.4 was utilized in evaluating artifacts and potential archaeological sites. The fieldwork was conducted from August 14 – 18, 2023. Archaeological testing methods within the APE included visual inspection, pedestrian survey, and the systematic use of STPs. Overall, the soil encountered varied levels of disturbance and there were no archaeological sites identified and no further testing recommended. DHR concurred with these findings and issued a “No Historic Properties Affected” finding for the Preferred Alternative under Section 106 of the NHPA on October 13, 2023. See **Appendix E** for the Phase IB report.

3.9. Pedestrian and Bicycle Connectivity

There are pedestrian sidewalks provided along the roadway network within and adjacent to the study area. Also, there is a shared-use path (SUP) located along the west side of Route 1. According to the 2023 Countywide Trails Plan, this SUP provides access along Route 1 through the North Woodbridge area. (County, 2023). In addition, the Plan identifies a SUP along Marina Way north of the study. This SUP is located along the west side of Marna Way and provides connectivity between Annapolis Way and the Occoquan Marina. The County has also identified the following planned bike lanes, SUPs, and sharrows lanes within and immediately adjacent to the study area:

- Planned bike lanes along Annapolis Way between Route 1 and Route 123.
- Planned sharrows lanes from the Marina Way and Annapolis Way intersection to Occoquan Road. Sharrows lanes are planned for the Marina Way Extension project.
- Planned SUP along Route 123 from Route 1 to I-95.

All existing pedestrian sidewalks, SUPs, planned SUPs, planned bike lanes, and planned sharrows lanes are illustrated in **Figure 3-6**.

No Build Alternative

The No Build Alternative would not impact existing pedestrian sidewalks and SUPs. The planned pedestrian and bicycle connectivity in North Woodbridge could continue as planned except for the planned sharrows lanes. Sharrows lanes could not be constructed because there would be no Marina Way Extension roadway to accommodate the lanes.

Preferred Alternative

The Preferred Alternative would not directly impact existing or future pedestrian facilities or SUPs. This alternative would also include the sharrows lanes as they are identified in the Mobility Plan. During construction of the Preferred Alternative, there would be minor, short-term impacts to the pedestrian facilities. These impacts are associated with temporarily closing portions of the sidewalks to ensure pedestrian safety during construction. Detours to pedestrians would be provided to maintain connectivity and use of the facilities (i.e., sidewalks).

3.10. Construction Impacts

During construction, temporary environmental impacts usually can be controlled, minimized, or mitigated through careful attention to prudent construction practices and methods. Potential temporary construction impacts and preventative practices are summarized below.

3.10.1. Air Quality

Temporary air quality Impacts associated with emissions from construction equipment and vehicles that travel to and from the project site may occur during construction. Also, fugitive dust generated from ground disturbing and earthmoving activities may occur but would be short term and temporary. To minimize and mitigate these impacts, all applicable local, state, and federal regulations would be

complied with, and measures would be implemented per VDOT's most current *Road and Bridge Specifications* to minimize air pollution.

3.10.2. Noise

During construction, noise generated from various construction activities would be present within the study area. All construction noise would be temporary and would stop when construction is completed. The contractor would be required to conform to the specifications found in VDOT's *Road and Bridge Specifications*. Adherence to this policy of establishing a maximum level of noise that construction operations can generate would reduce the potential impact of construction noise on the surrounding community.

3.10.3. Water Resources

During construction, the potential erosion of soils during ground-disturbing activities (e.g., excavation for the road, use of staging areas, etc.) may lead to non-point source pollutants possibly entering groundwater or surface water from storm water runoff. Also, there is potential for hazardous chemicals contamination of groundwater or surface water due to possible fuel spills or leaks from hazardous chemicals storage on the project site.

To minimize these possible short-term impacts, appropriate erosion and sediment control practices would be implemented in accordance with the Virginia Erosion and Sediment Control Regulations, the Virginia Stormwater Management Law and regulations, and VDOT's *Road and Bridge Specifications*. These regulations and specifications also prohibit contractors from discharging any contaminant that may affect water quality. In the event of accidental spills, the contractor is required to immediately notify all appropriate local, state, and federal agencies and to take immediate action to contain and remove the contaminant.

3.10.4. Wildlife including Threatened and Endangered Species

Potential wildlife impacts that may occur during construction includes temporary disturbance or displacement of wildlife due to construction noise, removal of habitat, wildlife collision with construction equipment and vehicles, and sedimentation of aquatic habitats.

All disturbance to potential wildlife habitat has been minimized to the maximum extent possible. Best management practices (BMPs) for erosion and sediment control would be implemented to prevent disturbance to any potential aquatic habitat and all disturbed areas would be revegetated after construction. These activities would be done in accordance with the latest version of VDOT's Road and Bridge Specifications.

The No Build Alternative would have no effect on the northern long-eared bat or its habitat, the tri-colored bat or its habitat, the monarch butterfly or its habitat, the brook floater or its habitat, or on the spotted turtle or its habitat.

The Preferred Alternative would impact 1.1 acres of forest which includes potential summer roosting and foraging habitat. By applying an April 1st to November 14th Time of Year Restriction (TOYR) on tree removal, the Preferred Alternative activity may result in an effect determination of May Affect Likely to Adversely Affect for the NLEB and Not Likely to Adversely Affect Not for the tri-colored bat. This determination is dependent upon compliance with VDOT's Special Provision for Tree Removal Time of Year Restriction for Roosting Bat Habitat (SP522-000130-02, effective December 22, 2022) which states that no trees greater than or equal to 3 inches diameter at breast height (DBH) shall be removed from

April 1 to November 14 unless otherwise allowed by the County and the VDOT Engineer as approved by the VDOT District Environmental Manager.

The Preferred Alternative would have no effect on the brook floater as no suitable habitat is present within the study area or within the downstream area that may be affected by sedimentation or runoff resulting from the project. Compliance with applicable state and local erosion and sediment control/storm water management laws and regulations would minimize adverse impacts to the aquatic ecosystem because of activities associated with the Preferred Alternative.

The Preferred Alternative may affect but would not likely adversely affect the monarch butterfly. The monarch butterfly is not expected within the study area due to marginal breeding and foraging habitat conditions.

Mitigation measures for this project could include restricting vegetation removal to outside the nesting and summer roosting seasons, minimizing clearing and grubbing, and prompt reseeding of disturbed areas with native vegetation.

3.10.5. Health and Safety

There is potential for construction of the Preferred Alternative to present health and safety risks to construction workers and members of the public attempting to cross the work zone. Additionally, the response time of local emergency services could be affected by traffic delays during construction.

Emergency vehicle access to residences and businesses within the surrounding community would continue via the existing roadway network. Further information on potential air quality and noise impacts during construction can be found in this section.

Construction of the Preferred Alternative would be performed in compliance with FHWA's Work Zone Safety and Mobility Rule (23 CFR Part 630, Subpart J), with the of the goal of expanding work zone impacts management beyond traffic safety and control by employing transportation management strategies, as applicable to the project.

The contractor would develop and implement a transportation management plan (TMP) to reduce traffic and mobility impacts, improve safety, and promote coordination within and around the work zone. Emergency vehicle access would be considered in the Traffic Management Plan (TMP) and Temporary Traffic Control (TTC) plans.

3.10.6. Utilities and Infrastructure

During the detailed design stage, utilities designation (mapping) would be conducted at a Quality Level B in accordance with the VDOT Utility Manual of Instructions to determine the approximate horizontal and subsurface utility locations within the project corridor. Potential conflicts would be further evaluated by performing utility location services (test holes – Quality Level A services) to determine the exact horizontal and vertical locations of potential utility conflicts. Continuous coordination with utility companies during design and construction would also be provided to avoid utilities conflicts, to protect-in-place, and to minimize relocations or adjustments to the extent practicable.

Figure 3-6: Existing and Proposed Pedestrian Facilities

If existing utilities are impacted during construction, temporary relocations or mitigations will be implemented to maintain service and limit utility down time. All existing utilities would be protected in accordance with each utility's design standards. Utility impacts would be limited to the project's LOD during the period of construction. All relocations, adjustments, or upgrades of utilities would be incorporated into the project improvements prior to construction.

3.10.7. Traffic and Transportation

A TMP will be prepared for the project. The TMP will define the approach to mitigate for work zone impacts on local traffic and identify traffic safety and control measures. Also, a TTC Plan will be prepared. It will identify the temporary sign and pavement marking, and the sequence of construction. The preparation of the TTC plan will include the information outlined in VDOT Instructional and Informational Memorandum (IIM) LD-241.7 and IIM TE-351.5, which relate to work zone safety and mobility TMP requirements. All traffic control would be accomplished in accordance with the Manual on Uniform Traffic Control Devices (MUTCD). There are no detours planned for construction of this project.

Transportation mitigation measures considered as part of a TMP may include the following:

- Evaluating local traffic conditions to adjust signal operations, if needed, to ensure appropriate flow of traffic.
- Encouraging travelers to modify their routes and avoid the study area during major construction operations along Annapolis Way and Route 123.
- Informing citizens and businesses about the duration of construction activities, including any periods of traffic diversions, if applicable, and notifying the public through social media, County website, and "pardon our dust" meetings with local business owners and other groups.
- Installing appropriate temporary signage.
- Utilizing Intelligent Transportation Systems (ITS) along Route1, Route 123, Horner Road, and Annapolis Way to advise drivers of potential construction-related delays.

All traffic control elements identified in the TMP will be accomplished in accordance with the Manual on Uniform Traffic Control Devices (MUTCD). There are no detours planned for construction of this project.

3.10.8. Solid Wastes and Hazardous Materials

This assessment was performed in accordance with the American Society of Testing and Materials (ASTM) Standard Practice for the Phase I Environmental Site Assessment Process (ASTM Designation: E1527-21) and the United States Environmental Protection Agency Standard Practice for All Appropriate Inquiries (AAI) (40 CFR Part 312). In accordance with ASTM, AAI does not mean an exhaustive assessment of a property, nor does it eliminate uncertainty regarding environmental conditions.

ASTM E1527-21 defines RECs as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment.

This assessment has identified one REC, the former Gordon Plaza Dry Cleaner, located at 13276 Gordon Boulevard, associated with the site. No CRECs or HRECs were identified in association with the site. This site is currently being evaluated by the landowner and multiple groundwater wells are installed at a depth of 30 feet around the property. It is unknown currently what environmental concerns exist with this property. Coordination with the property owner is ongoing to determine the concerns.

The Gordon Plaza Dry Cleaner property would not be impacted by this project. The developer that is building the proposed North Woodbridge Town Center will be demolishing the building and constructing new businesses at this location before this project is constructed. The developer has placed the property into the Virginia Department of Environmental Quality's Voluntary Remediation Program. All solid waste material resulting from clearing and grubbing, demolition, or other construction operations would be removed from the project and disposed of in an appropriate manner. If contaminated soils are encountered during construction, the County would develop and implement appropriate procedures for their proper management and coordinate the removal, disposal, and/or treatment of the soil, as necessary. If contaminated groundwater is encountered during construction, the County would implement appropriate specifications for proper management and treatment of the water, as necessary.

For further information, please refer to the Phase I Environmental Site Assessment included in **Appendix F**.

3.11. Indirect Effects

Indirect effects as those that are caused by the proposed action but occur later in time or farther in distance than the direct impacts but are still reasonably foreseeable. The most common indirect effects associated with highway projects have to do with induced development, that is, development and the impacts of such development that would not otherwise occur if the project were not constructed. All the surrounding land is either already developed or in the planning stages of development; therefore, the project would not be the direct cause of induced development. The project is consistent with local comprehensive planning regarding land use goals in the surrounding area.

No-Build Alternative

Under the No Build Alternative, the population and employment in the area is expected to continue to grow. This growth will continue to put pressure on the traffic congestion of the roadways throughout the area. Also, accessibility to local businesses and residential communities would continue to be limited in the North Woodbridge area. With the increase in traffic congestion along the major feeder roads to the area, the area would experience impacts to air quality and noise to the surrounding area. Also, the lack of direct access to the proposed North Woodbridge Town Center would require drivers to access the shopping center from Route 123. The increase in traffic movements along congested roadways can lead to safety issues for the travelers.

Wildlife habitat within the study area is fragmented and previously disturbed by Route 1 (Richmond Highway), other roadways, and commercial and residential development. The No Build Alternative would not result in further fragmentation of wildlife habitats however, present and planned future development and transportation projects would continue to reduce habitat areas. Under the No Build Alternative, wildlife, including threatened and endangered species, which occupy nearby forested habitats would continue to experience disturbance from degradation of habitat from soil erosion, traffic noise, collision with vehicles, and introduction of invasive plants.

Preferred Alternative

The project is located between I-95 and Richmond Highway (US Route 1) and adjacent to Gordon Boulevard (Route 123). Route 1 is considered a major thoroughfare that serves the eastern portions of Prince William and Fairfax Counties. Annapolis Way intersects Route 1 at the northern terminus of the project and Route 123 intersects Route 1 at the southern terminus of the project. Route 1 experiences heavy traffic volume due to vehicles accessing the I-95/Route 123 Commuter Lot, VRE Station, and daily commuting patterns. The existing Marina Way serves as the only connection to a marina at Occoquan Harbor, Vulcan Materials Company Woodbridge sand yard, and the Rivergate apartments. The extension of Marina Way would reduce congestion on surrounding roads and provide pedestrian access to the proposed North Woodbridge Town Center. These improvements represent incremental improvements to access within an area that is already planned to be developed. Therefore, the potential for the project to induce growth due to increased accessibility is anticipated to be low.

The attractiveness of a location and the strength of the regional economy are positively correlated with the potential for growth in that area. Predictions for continued population growth in Prince William County (see **Section 3.2** of the EA) support a high level of attractiveness and a strong economy. A portion of the anticipated future employment in North Woodbridge is centered around the development of the North Woodbridge Town Center (Prince William County, 2019). The Preferred Alternative would reduce congestion and improve pedestrian access and mobility in and around the Town Center.

Population growth and development rate within a locality depends upon land availability and local political conditions as well as land use controls. Most of North Woodbridge is zoned for general commercial development which allows for a wide range of commercial uses. Also, a sizable portion of the North Woodbridge area is within the Redevelopment Overlay District. The purpose of this district is to promote redevelopment and the economic viability of older commercial neighborhoods that have experienced economic decline (Prince William County, 2019).

In conclusion, it is not anticipated that the Preferred Alternative would encourage any changes in land use that are not already expected. The extension of Marina Way has been identified in the transportation section of the North Woodbridge Small Area Plan which makes the Preferred Alternative consistent with the future condition of land use that is already anticipated and planned for by Prince William County.

The Preferred Alternative alignment would allow for the County to construct its planned, direct access to the North Woodbridge Town Center. The proposed roadway will carry travelers directly to the businesses and avoid using the congested Route 1 and Route 123 to access the town center. This would remove future congestion from the Route 1 and 123 corridors which could improve travel reliability, safety, and emergency vehicle response times. By the time the Preferred Alternative is constructed, local businesses at the Gordon Plaza would have relocated to accommodate the roadway. The business relocations are separate from this project and have already been planned. Also, the County's North Woodbridge Small Area Plan has identified the extension of Marina Way as a priority for the economic growth of the area. The County's future land use and zoning plans are designed to accept this new roadway.

The Preferred Alternative is not expected to cause changes to current and future land use and zoning designations. Also, the County has already defined areas in North Woodbridge for growth and development. With no induced growth anticipated for the Preferred Alternative, it would not have indirect effects on socioeconomic resources.

The Preferred Alternative would require the removal of trees from a forested area within the proposed alignment of the roadway. These forest communities may provide summer roosting and foraging habitat for wildlife including federally listed threatened Northern long-eared bat and tri-colored bat. Vehicular traffic on the proposed Marina Way is expected to introduce an additional source of noise for the remaining forest habitats adjacent to the roadway. The new roadway is expected to interfere with wildlife movements of terrestrial animals across the roadway. Although these direct impacts occur, no induced growth is expected because of the alternative. Therefore, the Preferred Alternative would have no indirect effects.

The increased impervious surface associated with the Preferred Alternative can increase runoff from roadways which can contain heavy metals, salt, organic compounds, and nutrients. This could facilitate the degradation of nearby waterbodies and wetlands through deposition of sediments or contamination from chemical pollutants. Potential indirect impacts to water quality and wetlands during construction include erosion and sedimentation or accidental spills of hazardous materials from construction equipment. Please refer to Section 3.8.3 for the erosion control practices that minimize risks of potential degradation of water quality due to increased impervious surface and drainage alteration.

For more detailed information regarding this section, please refer to the ICE Analysis included in **Appendix G**.

3.12. Cumulative Effects

Cumulative effects are the incremental effects of the action when added to other past, present, and reasonably foreseeable future actions. The assessment of cumulative effects requires an assessment of the impact that past and present actions have had on the environmental resources in the study area that would also be impacted by the project. Additionally, a review of cumulative effects requires an assessment of how reasonably foreseeable future actions may affect the same environmental resources that would be directly affected by the project. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. The cumulative effects analysis is based on the geographic area affected; time span; affected resources; past, present, and reasonably foreseeable actions; impacts of those actions and the overall impact on the identified resources from the accumulation of these actions.

Geographic Area and Time Span. The geographic limits of the resource specific study areas used for the cumulative effects analysis are the same as those used for the indirect effects analysis. The time span for the analysis is from the mid-1980s (when the development of eastern Prince William County began) to 2050, which is the design year for the project.

Affected Resources. The resources that are affected by the proposed project are those discussed in section 3.11.

Past, Present, and Reasonably Foreseeable Actions. The past, present and reasonably foreseeable future actions that contribute to cumulative effects are described below. The focus of the discussion is

North Woodbridge, which encompasses the cumulative study area for socioeconomic resources and natural resources.

Past Actions:

Prior to World War II, most of the land area in Woodbridge was dedicated to agriculture. Between 1950 and 1960, improvements to widen Route 1 between Richmond to Woodbridge and the construction of I-95 in eastern Prince William County contributed to the development of suburbs and self-contained shopping centers including the construction of Gordon Plaza in the early 1970s. Based on historic Google imagery, the park and ride located at 1100 Annapolis Way was constructed in the late 1990s.

More recently, multiple apartment buildings have been constructed in North Woodbridge close to the study area. These new developments include the Rivergate Apartments in 2017, the Viridium Apartments in 2022, and the Landing at Mason's Bridge in 2023.

Present and reasonably Foreseeable Future Actions:

The Annapolis Way Extension project has secured funding through the Northern Virginia Transportation Authority in July 2020 (NVTA, 2020). The project is the extension of Annapolis Way to connect the intersections of Annapolis Way and Route 1, and Annapolis Way Route 123.

The Route 1 widening project includes widening Route 1 to six lanes from Mt. Pleasant Drive to the Occoquan River. This project included improvements to the following intersections:

- Route 1 at Occoquan Road/ Dawson Beach Road – Improvements included dual left turns from northbound and southbound Route 1.
- Route 1 at Route 123 - Improvements include the addition of two left turn lanes along Route 1 for the northbound vehicles turning left onto Route 123.
- Route 1 at Annapolis Way – Improvements include two additional left turn lanes along Annapolis Way vehicles turning left onto Route 1.

The Route 1 at Route 123 Interchange project is in the design stage and includes widening of Route 123 as well as intersection improvements to Route 1 at Annapolis Way.

No-Build Alternative

The No-Build Alternative would have a minor adverse cumulative effect on communities, businesses, and the population that lives in the area. The population is expected to grow over the next few decades. This growth will contribute partly to the ever expanding economic and residential development that the County has planned for the area. The growth in the area is expected to put stress on the local roadway network regarding traffic congestion. Under this alternative, the traffic in the North Woodbridge area would continue to worsen which would negatively affect local businesses, residential access, and commute times. Therefore, the alternative would have negative cumulative effects on communities and community cohesion.

Preferred Alternative

Past and present actions have urbanized the area. Access to communities and businesses has increased through the urbanization but the traffic that has followed the growth has hindered growth in the area due to lowering accessibility and desirability due to traffic. The Preferred Alternative would extend an existing roadway and improve pedestrian facilities in this urban area which in turn improves accessibility to communities and local businesses in an area. The Preferred Alternative could have short-term minor adverse effects while the roadway and associated improvements are under construction. The long-term beneficial effect is associated with accessibility and community cohesion for the area.

The Preferred Alternative's impacts to wildlife and threatened and endangered species habitat would contribute to the cumulative effects that have occurred in the past to these resources within the study area. These effects should be minimized by the implementation of best management practices such as implementation of TOYRs. Construction and post-construction of the Preferred Alternative would potentially contribute to short-term, minor, localized increases in pollutants and nutrients causing impairment to waterways. Since construction of the Preferred Alternative would upgrade and replace current stormwater management systems, implementation of the Preferred Alternative could improve roadway runoff water quality from current conditions.

Past and present actions have affected the current state of socioeconomic, natural, and historic resources within the associated ICE Study Areas, and future actions would continue to affect these resources regardless of this project. The region is already developed, therefore cumulative effects of the Preferred Alternative are expected to be minimal. In addition, current regulatory requirements and planning practices are expected to help avoid or minimize the contribution of present and future actions to adverse cumulative effects for socioeconomic, natural, and historic resources.

For more detailed information regarding this section, please refer to the ICE Analysis included in **Appendix G**.

Section 4 – Coordination & Comments

4.1. Agency Coordination

Early and continuing coordination with the public and appropriate public agencies is an essential part of the environmental process to determine the scope of environmental documentation, the level of analysis, potential impacts and mitigation measures and related environmental requirements. Agency consultation and public participation for this project have and will continue to be accomplished through a variety of formal and informal methods, including project development team meetings, agency scoping, interagency coordination meetings, and a public hearing. This section summarizes the results of the County's efforts to fully identify, address, and resolve project-related issues through early and continuing coordination. The following is a list of agencies that have been contacted regarding the project.

- Prince William County government agencies
- Virginia Marine Resources Commission*
- Virginia Department of Historic Resources (VDHR)
- Virginia Outdoors Foundation
- Virginia Department of Health
- Virginia Department of Forestry*
- Virginia Department of Wildlife Resources
- Virginia Department of Environmental Quality*
- Virginia Department of Conservation and Recreation*
- Virginia Department of Energy
- Virginia Department of Agriculture and Consumer Services*
- US Army Corps of Engineers
- US Fish and Wildlife Service

During the scoping process, the agencies were requested to provide feedback on any issues or concerns regarding the work associated with the proposed project. Agencies that did not send a response to the scoping letters are marked with an asterisk.

Information obtained through scoping and identified in this EA included the project's proximity to public drinking water sources including groundwater wells and surface water intakes. Also, the assurance that best management practices will be utilized during construction which should include erosion and sediments controls and spill prevention controls and countermeasures throughout the project site. Please refer to **Section 3.7.1** about water quality and the best management practices that have been integrated into the project.

All agency responses can be found in **Appendix H**. The input received was used to determine what would be appropriate for study in the EA. Accordingly, each of the issues and concerns have been addressed in the Environmental Consequences section of this EA (Section 3) and/or in the detailed technical reports prepared in support of the EA.

4.2. Public Involvement

On October 17, 2024, the Prince William County (PWC) Department of Transportation held a Location and Design Public Hearing at Occoquan Elementary School located at 12915 Occoquan Road in Woodbridge, Virginia. Those who attended were able to view informational displays, design drawings, the EA, technical reports, and information on the right of way acquisition process. A PowerPoint slide presentation highlighted project history, design features, environmental effects, and information on how public comments could be submitted. A question-and-answer session was also conducted.

The Location and Design Public Hearing was attended by sixteen members of the public. During the hearing and subsequent public comment period, five written and one oral comment were submitted for the record. Among these, one comment expressed opposition to the project, while the remaining comments supported the project but offered suggestions for design modifications. The primary concerns raised by residents in the Woodbridge area focused on the number of traffic lanes and pedestrian accessibility. A comprehensive list of the comments received, along with responses to each, is provided in **Appendix I**. It's worth noting that none of the comments received during the public review of the EA did not necessitate changes to the EA analyses or findings.

This document was public noticed for 15 days on January 30, 2025. No public comments were received. Subsequently due to rescinding Executive Orders regarding Environmental Justice and Climate Change, modifications were made to this EA and this document will be public noticed for an additional 15 days.

References

The Center for Conservation Biology (CCB), 2024. Eagle Nest Locator. Retrieved January 15, 2024 from https://ccbbirds.org/what-we-do/research/species-of-concern/virginia-eagles/nest-locator/

Council on Environmental Quality (CEQ), 1997. Considering Cumulative Effects Under the National Environmental Policy Act. Retrieved January 25, 2024, from https://ceq.doe.gov/publications/cumulative_effects.html

Federal Highway Administration (FHA), 2023. "*INFORMATION: Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents*", January 18, 2023. See: https://www.fhwa.dot.gov/environment/air_quality/air_toxics/

Highway Control Manual (HCM) 2010. 2010 Highway Control Manual. Transportation Research Board

Kimley Horn, 2020. STARS Route 1 at Route 123 Intersection Analysis.

Metropolitan Washington Council of Governments (MWCOG), 2019. Activity Center Maps. Retrieved October 16, 2023 from https://www.mwcog.org/documents/2013/01/13/activity-centers-maps/

Metropolitan Washington Council of Governments, 2024. Transportation Planning Board. Retrieved January 19, 2024, from https://www.mwcog.org/tpb/

Northern Virginia Transportation Authority (NVTA), 2020. North Woodbridge Mobility Improvements. Retrieved October 25, 2023 from https://thenovaauthority.org/wp-content/uploads/2020/07/PWC-024.pdf

Prince William Conservation Alliance, 2003. What is the Occoquan Reservoir Watershed and Why Should You Care?, Retrieved December 22, 2023 from https://www.pwconserve.org/issues/occoquan/index.html

Prince William County (County), 2005. Prince William County's Urban Mixed-use Master Zoning Plan, North Woodbridge Summary Report. Prepared by EDAW, Inc., Robert Charles Lesser and Company LLC, and Kimley Horn and Associates. Retrieved October 16, 2023 from https://eservice.pwcgov.org/planning/documents/n_woodbridge_summary.pdf

Prince William County (County), 2014. Prince William Report 2014. Retrieved December 14, 2023, from https://www.pwcva.gov/assets/2021-04/pwreport2014q4.pdf

Prince William County (County), 2019. North Woodbridge Small Area Plan. Retrieved December 14, 2023 from https://eservice.pwcgov.org/planning/documents/NorthWoodbridgeSAP/NorthWoodbridgeSAP_DRAFT.pdf

Prince William County (County), 2020. 2020 Census Redistricting Data Retrieved December 12, 2023, from https://www.pwcva.gov/department/gis/2020-census

Prince William County (County), 2022. Prince William County Demographics. Retrieved December 14, 2023 from https://demographics-pwcgov.hub.arcgis.com/pages/population-estimates

Prince William County (County), 2023. 2023 Countywide Trails Plan Retrieved January 24, 2024 from https://www.pwcva.gov/assets/2023-01/Countywide%20Trails%20Map.pdf

Prince William County Department of Public Works, 2021. Update on Evaluation of Occoquan Watershed and Reservoir Protection Overlay District. Retrieved December 22, 2023 from https://www.pwcva.gov/assets/2022-01/Evaluation%20Occoquan%20Watershed%20and%20Reservoir%20Protection%20Overlay%20District.pdf

Service Authority, 2023. Occoquan River Crossing Project. Retrieved December 22, 2023, from https://www.pwcsa.org/Occoquan-River-Crossing

Transportation Planning Board (TPB), 2022. Visualize 2045: Aspirational Initiatives. Retrieved October 13, 2023 from https://visualize2045.org/wp-content/uploads/2022/08/Viz2045-rp-1-AI-Booklet_hyperlinked.pdf

University of Virginia Weldon Cooper Center for Public Service. (2022). Virginia Population Projections. Retrieved December 14, 2023, from https://coopercenter.org/virginia-population-projections

U.S. Census Bureau, 2021. 2017-2021 American Community Survey 5-Year Estimates Retrieved December 12, 2023 from https://data.census.gov/table/ACSST5Y2021.S1101?t=Families%20and%20Living%20Arrangements&g=1400000US51153900201

U.S. Department of Health and Human Services, 2021. 2021 Poverty Guidelines. Retrieved January 17,2024 from https://aspe.hhs.gov/2021-poverty-guidelines

U.S. Environmental Protection Agency (EPA), 2013. Protection of Environment, 40 C.F.R. §93.109. Retrieved January 17, 2024 from https://www.govinfo.gov/content/pkg/CFR-2014-title40-vol20/xml/CFR-2014-title40-vol20-sec93-109.xml

U.S. Environmental Protection Agency, 2013. Protection of the Environment, 40 C.F.R. §93.114. Retrieved January 17, 2024 from https://www.govinfo.gov/content/pkg/CFR-2014-title40-vol20/xml/CFR-2014-title40-vol20-sec93-114.xml

U.S. Environmental Protection Agency, 2013. Protection of Environment, 40 C.F.R. §93.115. Retrieved January 17, 2024 from https://www.govinfo.gov/content/pkg/CFR-2014-title40-vol20/xml/CFR-2014-title40-vol20-sec93-115.xml

U.S. Environmental Protection Agency, 2018. National Air Toxics Assessment. Retrieved January 19, 2024, from https://www.epa.gov/national-air-toxics-assessment

U.S Fish and Wildlife Service (USFWS), 2007. Bald Eagle Monitoring Guidelines-Southeastern US. Retrieved December 20, 2023 from https://www.fws.gov/sites/default/files/documents/bald-eagle-monitoring-guidelines-2007.pdf

U.S. Fish and Wildlife Service, 2023. Information for Planning and Consultation. February 22, 2024, from https://ipac.ecosphere.fws.gov/

U.S. Fish and Wildlife Service, 2020. Monarch Butterfly Species Status Assessment (SSA) Report. Retrieved December 10, 2023 from https://www.fws.gov/media/monarch-butterfly-species-status-assessment-ssa-report

U.S. Geological Survey (USGS), 2016. Ground Water Atlas of the United States Delaware, Maryland, New Jersey, North Carolina, Pennsylvania, Virginia, West Virginia. Retrieved December 22, 2023, from https://pubs.usgs.gov/ha/ha730/ch_l/L-text4.html

Virginia Department of Conservation and Recreation (DCR), 2023. Virginia Natural Heritage Data Explorer. Retrieved December 22, 2023, from https://www.dcr.virginia.gov/natural-heritage/nhdeinfo

Virginia Department of Environmental Quality (DEQ), 2022. Final 2022 305(b)/303(d) Water Quality Assessment Integrated Report. Retrieved December 10, 2023 from https://www.deq.virginia.gov/our-programs/water/water-quality/assessments/integrated-report

Virginia Department of Wildlife Resources (DWR), 2022. Wildlife Environmental Review Map Service (WERMS). Retrieved December 22, 2023.

Virginia Department of Transportation (VDOT), 2019. 2019 Virginia Department of Transportation Jurisdiction Report Daily Traffic Volume Estimates Including Vehicle Classification Estimates – Prince William County. Retrieved October 13, 2023 from https://www.virginiadot.org/info/resources/Traffic_2019/AADT_076_PrinceWilliam_2019.pdf