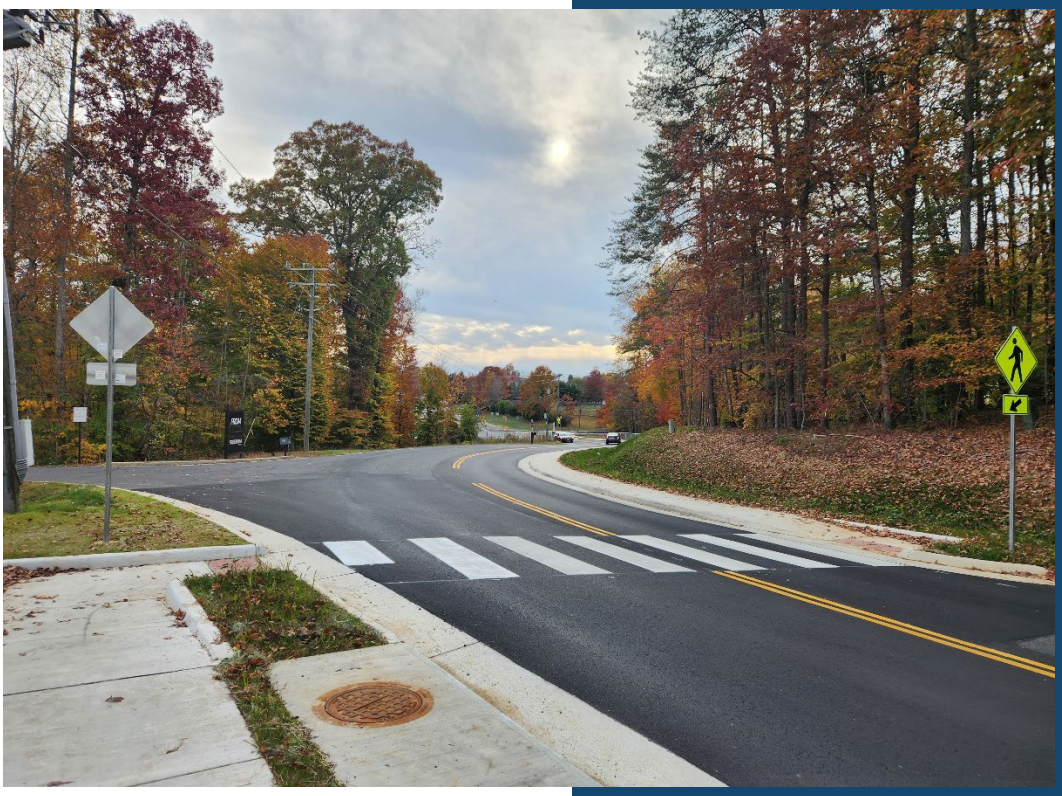
2024

Transportation Master Plan



STAFFORD Virginia

Transportation Master Plan

Stafford County

11/19/2024

TABLE OF CONTENTS

Strategic Plan and Transportation Master Plan 1

1 Phase 1 Current Projects 2

1.1 Major Projects 2

1.2 Rural Roadway Projects 4

2 Phase 2 Short-Term Projects 6

2.1 Local Roadway Plan 6

2.1.1 US Route 1 7

2.1.2 Route 610 9

2.1.3 Route 17 11

2.1.4 Route 3 13

2.1.5 Route 218 15

2.1.6 Collector Plan 17

2.1.7 Summary of Phase 2 Roadway Projects 18

2.2 Multimodal Plan 20

2.2.1 North Stafford Bicycle and Pedestrian Plan 21

2.2.2 South Stafford Bicycle and Pedestrian Plan 24

2.2.3 Stafford Heritage Trailways Plan 27

2.2.4 Transit Plan 28

3 Phase 3 Long-Term Projects 29

3.1 Future Land Use 29

3.2 Local Roadway Plan 31

3.2.1 Western Network 31

3.2.2 Localized Widenings 32

3.2.3 Other Major Roadway Scenarios 33

3.3 Regional Roadway Plan 34

3.3.1 Rappahannock River Crossing 34

3.3.2 Outer Connector and Western Bypass 34

4 Summary of Projects 35

4.1 Table of Projects 35

4.2 Table of Studies 38

4.3 Map of Projects 39

Table 1: Current Projects 2
Table 2: Safety/Wedge-Widening Plan 4
Table 3: Route 1 Corridor Blueprint 8
Table 4: Route 610 Corridor Blueprint 10
Table 5: Route 17 Corridor Blueprint 12
Table 6: Route 3 Corridor Blueprint 14
Table 7: Route 218 Corridor Blueprint 16
Table 8: Collector Corridor Blueprint 17
Table 9: Summary of Phase 2 Roadway Projects 18
Table 10: North Stafford Bicycle and Pedestrian Blueprint 22
Table 11: South Stafford Bicycle and Pedestrian Blueprint 25
Table 12: Stafford Heritage Trail Blueprint 27
Table 13: Future Modelled Scenarios .....
Table 14: Western Network Blueprint .....
Table 15: Localized Widenings Blueprint .....
Table 16: Roadway Project Scenarios 33
Table 17: River Crossing Blueprint 34
Table 18: Outer Connector and Western Bypass Blueprint 34

Figure 1: Route 1 Annual Person Hours of Delay 7
Figure 2: Route 1 Equivalent Property Damage Only (EPDO) Crashes Per 1 million VMT 7
Figure 3: Route 610 Annual Person Hours of Delay 9
Figure 4: Route 610 Equivalent Property Damage Only (EPDO) Crashes Per 1 million VMT 9
Figure 5: Route 17 Annual Person Hours of Delay 11
Figure 6: Route 17 Equivalent Property Damage Only (EPDO) Crashes Per 1 million VMT 11
Figure 7: Route 3 Annual Person Hours of Delay 13
Figure 8: Route 3 Equivalent Property Damage Only (EPDO) Crashes Per 1 million VMT 13
Figure 9: Route 218 Annual Person Hours of Delay 15
Figure 10: Route 218 Equivalent Property Damage Only (EPDO) Crashes Per 1 million VMT 15
Figure 11: Stafford County FY2023 Transit Ridership 28

Map 1: Current Projects 3
Map 2: Safety/Wedge-Widening Plan 5
Map 3: Summary of Phase 2 Roadway Projects 19
Map 4: North Stafford Bicycle and Pedestrian Focus Areas 21
Map 5: North Stafford Bicycle and Pedestrian Projects 23
Map 6: South Stafford Bicycle and Pedestrian Focus Areas 24
Map 7: South Stafford Bicycle and Pedestrian Projects 26
Map 8: Stafford Heritage Trail 27
Map 9: Stafford County Future Land Use Plan 30
Map 10: Western Network 31
Map 11: Localized Widenings 32
Map 12: Stafford County Geographical Restrictions 34

TRANSPORTATION MASTER PLAN

STRATEGIC PLAN AND TRANSPORTATION MASTER PLAN

The goal of the Transportation Master Plan (TMP) is to build a blueprint to guide transportation investment decisions and to help inform policymakers and county residents of the transportation planning process. This process undertook a performance-based planning approach that completed a needs assessment and prioritized projects for future consideration. The TMP process uses the Stafford County 2040 strategic plan approved by the Board of Supervisors to help guide its approach. The strategic plan's goal for transportation is to:

> **Develop a Multimodal Infrastructure and Transportation System**
>
> *Further infrastructure development in the community to provide an enhanced level of service. Stafford County's comprehensive transportation plan provides a variety of alternatives and fluid access throughout the community. Our network of roads is complemented by multimodal paths to ensure the safe and efficient movement of vehicles and pedestrian traffic.*

The strategic priority for transportation can be summarized into three categories that reduce congestion, increase safety, and provide better multimodal accessibility throughout the County. For the TMP blueprint, these metrics are used to visualize roadway needs throughout the County. The blueprint is encompassed by three phases: Phase 1 covers current Capital Improvement Program (CIP) projects and the rural safety/wedge-widening program; Phase 2 covers future short-term projects (roadway, bicycle and pedestrian, and transit) and future studies; and Phase 3 covers long term projects.

To better understand the existing transportation conditions and analyze projects, three metrics are used: **Annual Person Hours of Delay** per roadway segment, **Equivalent Property Damage Only (EPDO) crashes** per 1 million vehicle miles traveled (VMT), and **Multimodal Access to Destinations**. These metrics allow for an understanding of congestion, safety, and accessibility throughout the County weighted by the number of vehicles on a roadway (congestion and safety) and destinations able to be accessed (accessibility).

Congestion: Annual Person Hours of Delay
This measure analyzes the total number of person-hours of delay on a roadway segment. It helps to assess the potential for a project to reduce peak-period person-hours of delay.

Safety: Equivalent Property Damage Only (EPDO) Crash Rate
This measure analyzes the crash rate per 1 million vehicle miles traveled weighted by the equivalent property damage only (EPDO) value of fatal and injury crashes on a roadway segment. It helps to assess the potential for a project to reduce EPDO crashes. EPDO is a measure used by the Federal Highway Administration (FHWA) and EPDO values used are similar to the VDOT SMART SCALE program (Fatal & Severe Injury = 160; Moderate Injury = 20; Minor Injury = 10).

Accessibility: Multimodal Access to Destinations
This measure analyzes the access to destinations along the bicycle and pedestrian network. It helps to assess the potential for a project to increase access to destinations on a parcel-by-parcel basis.

These measures are in addition to the prioritization tool used in the draft TMP Study to analyze existing conditions along roadways and prioritize an initial list of projects for consideration. The initial list of projects is pulled into a second phase of analysis, where additional data analysis is completed. Rather than analyzing existing conditions, these measures are a second step, helping to analyze potential project benefits and providing a general overview of existing issues along a roadway or in a community. Furthermore, it helps to measure where additional projects that have not been identified in the initial phase of the TMP may be needed; these are locations where additional study is planned through the blueprint.

The following TMP document is a summary of the draft TMP study recently completed and is in addition to the Transportation Chapter of the Comprehensive Plan. It combines specific recommendations from the Comprehensive Plan and identifies further improvements that can be made through various scenarios.

1 PHASE 1 CURRENT PROJECTS

The first phase of the TMP focuses on current projects in the Capital Improvement Program (CIP). These projects have been supported by the Board of Supervisors over the last several years and by voters through a bond referendum in 2019. They are projects that support existing deficiencies in the transportation system and also support future needs as the county is expected to continue growing. The bond referendum was a mechanism that had a significant impact on the future of transportation in the County, providing funding to assist with major projects and rural safety improvement projects which all were identified through a Comprehensive Road evaluation completed prior to the referendum.

For FY25, the CIP focuses funding on existing projects that are currently underway in the engineering stage (**Map 1** and **Table 1**). Through FY30, the CIP assumes over $180 million in grant funding from state and federal sources and contains over $110 million in local funding, with $50 million coming from the 2019 bond referendum.

1.1 MAJOR PROJECTS

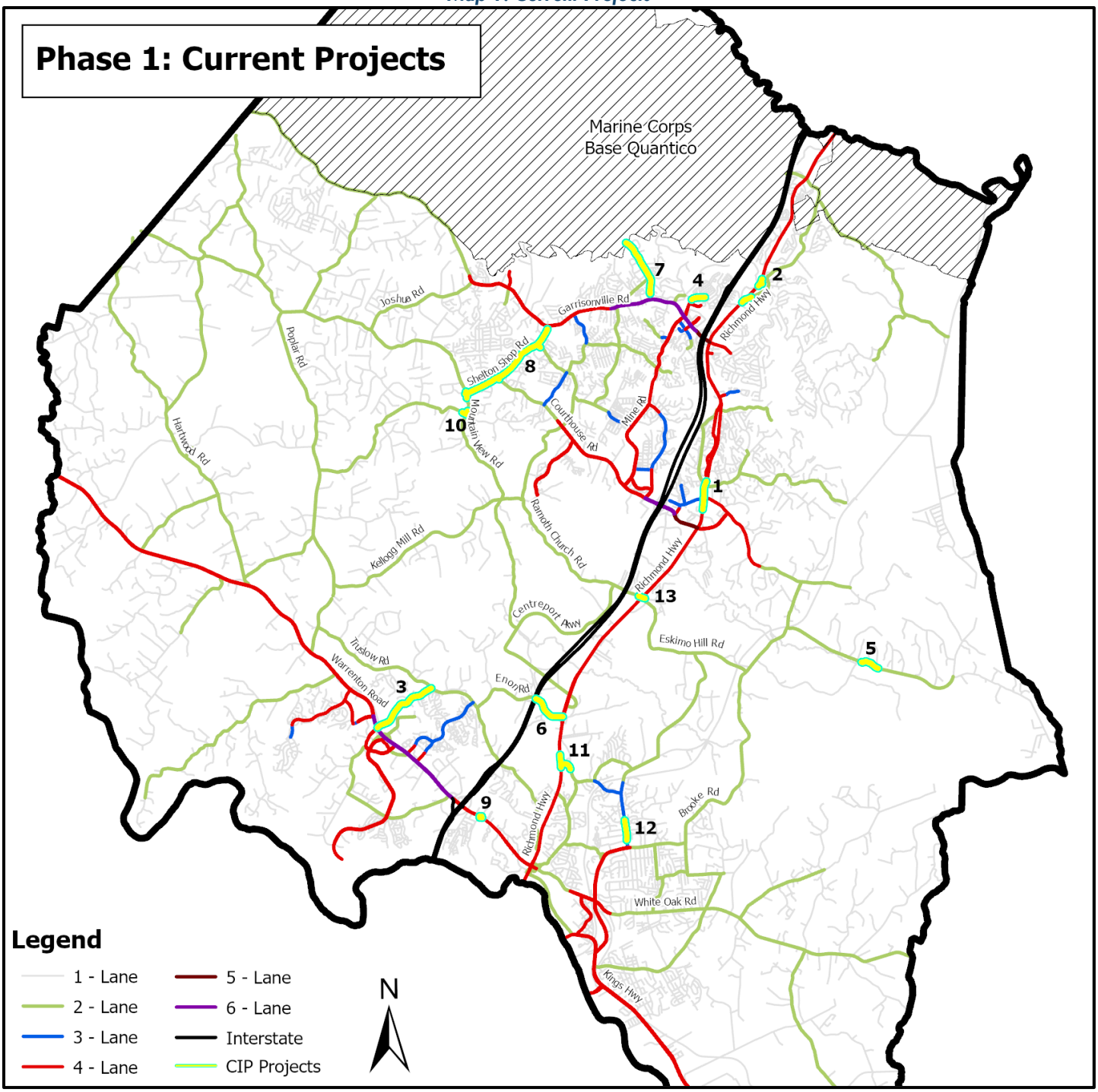
Included in the current project lists are 10 projects that have been underway for the past several years, with three projects near the construction stage, one project in the right-of-way stage, and six projects in the engineering stage. Three other projects, including two bond projects, have not yet begun but are expected to begin engineering in the next couple of years. Three additional projects, Garrisonville Road Widening Phase 1 and 2 and US-17 Business Sidewalk, are planned but not fully funded and will be included in Phase 2 of the Transportation Master Plan.

These projects are expected to significantly benefit Stafford County residents. Many have been partially funded through the VDOT SMART SCALE funding program, competing statewide with other projects.

Table 1: Current Projects

ID	Intersection	Improvement	Bond	Cost
1	**Route 1 and Courthouse Rd**	Turn Lanes	No	$26,700,000
2	**Route 1 and Telegraph Rd / Woodstock**	Turn Lanes / Realignment	No	$12,500,000
3	**Berea Church Rd**	Safety Improvements	No	$12,500,000
4	**Staffordboro Blvd**	Sidewalk	No	$ 2,100,000
5	**Brooke Rd**	Realignment	No	$12,500,000
6	**Enon Rd and Route 1**	Turn Lanes / 3-Lane Widening	Yes	$26,000,000
7	**Onville Rd**	Turn Lanes / 3-Lane Widening	Yes	$25,000,000
8	**Shelton Shop Rd**	Turn Lanes	Yes	$33,300,000
9	**US-17 Business at RV Pkwy**	Turn Lanes / Realignment	No	$11,000,000
10	**Stefaniga Rd and Mountain View Rd**	Roundabout	No	$ 6,300,000
11	**Route 1 and Layhill Rd**	Turn Lanes	Yes	$15,600,000
12	**Leeland Rd**	Turn Lanes / 3-Lane Widening	Yes	$21,200,000
13	**US Route 1 at American Legion/Eskimo Hill**	Turn Lanes	No	$ 4,100,000

Map 1: Current Projects



1.2 RURAL ROADWAY PROJECTS

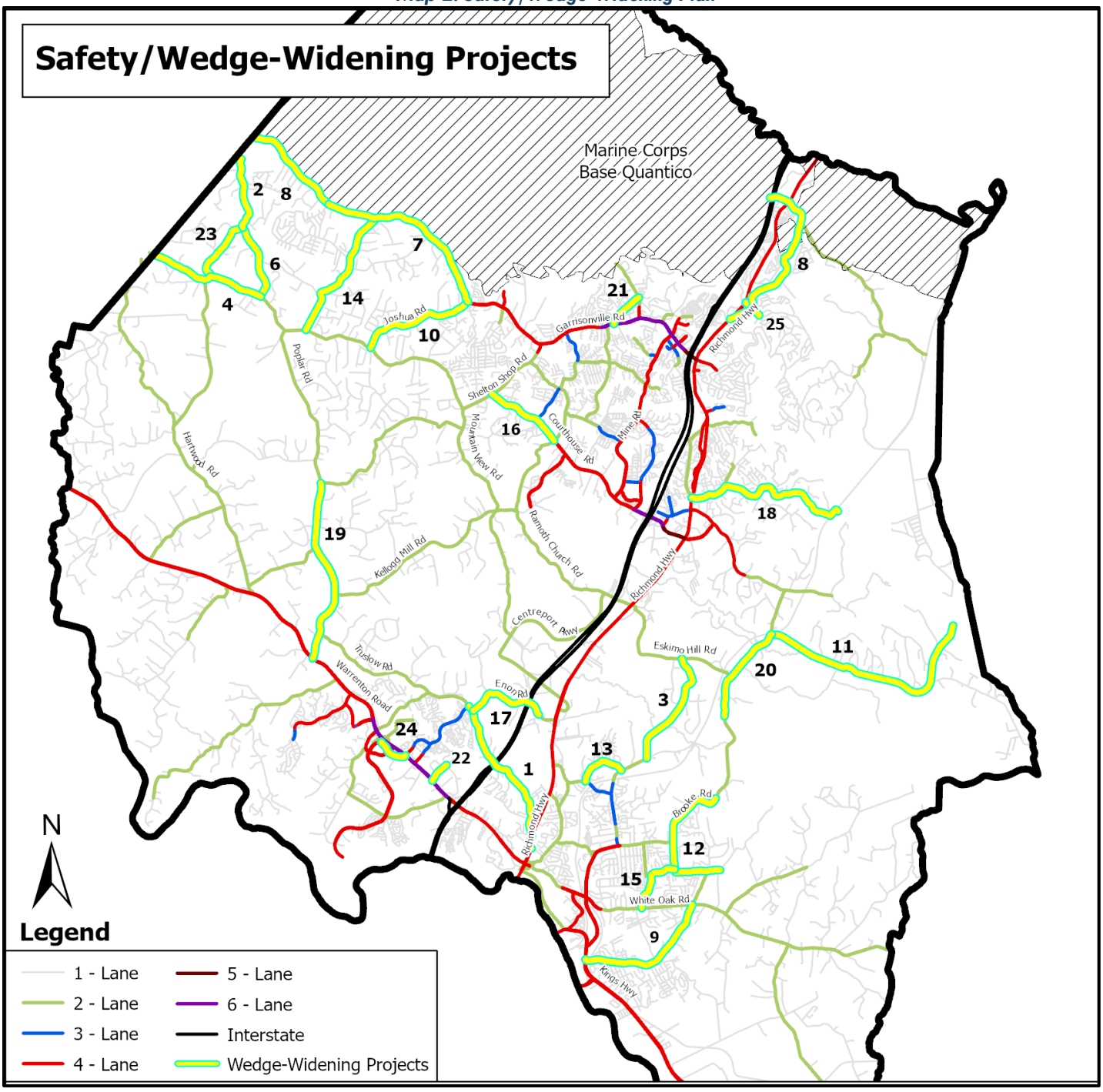
Also included in the CIP is a line item for Safety/Wedge-Widening. This is a specific type of rural safety improvement that increases the width of rural roads by two feet on each roadway shoulder for a total increase of around four feet to provide more recovery space if a vehicle starts to exit the roadway. As approved in the 2019 transportation bond, 35 rural safety improvement projects were proposed. Eight projects have been completed since 2020, with another three scheduled through 2025.

For this program, the projects are shown in **Table 2** and on **Map 2**. The CIP allocates $1 million per year in local funding until the remaining projects are completed. Of those 24 that are remaining, six are not recommended to be completed due to having one or fewer reported roadway departure crashes in the last five years. The 18 recommended projects are currently estimated to cost around $360,000 per lane mile with a total cost of around $16 million. Projects are ranked by the Equivalent Property Damage Only (EPDO) rate of fatal and injury crashes on a roadway segment (2019-2023 Crash Data).

Table 2: Safety/Wedge-Widening Plan

ID	Roadway	From/To	Crashes	EPDO Rate	Cost
1	**Truslow Road**	US Route 1 to Berea Church Rd	18	172.80	$1,116,000
2	**Tacketts Mill Road**	Heflin Rd to County Line	16	103.70	$648,000
3	**Potomac Run Road**	Potomac Run Rd	9	93.81	$828,000
4	**Poplar Road**	Tacketts Mill Rd to County Line	11	73.60	$828,000
5	**Telegraph Road**	Telegraph Rd	20	58.89	$1,044,000
6	**Tacketts Mill Road**	Poplar Rd to Heflin Rd	15	39.57	$540,000
7	**Garrisonville Road**	Joshua Rd to Lake Arrowhead Rd	22	38.38	$1,296,000
8	**Garrisonville Road**	Lake Arrowhead Rd to County Line	9	37.35	$756,000
9	**Ferry Road**	Ferry Rd	4	35.10	$936,000
10	**Joshua Road**	Joshua Rd	38	31.58	$792,000
11	**Brooke Road**	Andrew Chapel Rd to End	17	31.11	$1,476,000
12	**Brooke Road**	New Hope Rd to Near Stagecoach Rd	8	23.88	$1,008,000
13	**Morton Road**	Primmer House Rd to Leeland Rd	2	11.05	$360,000
14	**Rock Hill Church Road**	Rock Hill Church Rd	6	10.00	$972,000
~~15~~	~~**Little Whim Road**~~	~~Little Whim Rd~~	~~1~~	~~9.52~~	~~$432,000~~
16	**Courthouse Road**	Winding Creek Rd to Shelton Shop Rd	7	4.50	$540,000
17	**Enon Road**	Enon Rd	5	3.91	$540,000
18	**Hope Road**	Hope Rd	4	2.67	$1,080,000
19	**Poplar Road**	Kellogg Mill Rd to Mount Olive Rd	7	1.04	$504,000
20	**Brooke Road**	Retreat Ln to Andrew Chapel Rd	2	0.56	$396,000
~~21~~	~~**Barrett Heights Road**~~	~~Barrett Heights Rd~~	~~1~~	~~0.26~~	~~$252,000~~
~~22~~	~~**Falls Run Drive**~~	~~Falls Run Dr~~	~~0~~	~~0.00~~	~~$144,000~~
~~23~~	~~**Heflin Road**~~	~~Heflin Rd~~	~~0~~	~~0.00~~	~~$468,000~~
~~24~~	~~**Mewhirt Loop**~~	~~Mewhirt Loop~~	~~0~~	~~0.00~~	~~$108,000~~
~~25~~	~~**Woodstock Lane**~~	~~Woodstock Ln~~	~~0~~	~~0.00~~	~~$72,000~~

Map 2: Safety/Wedge-Widening Plan



2 PHASE 2 SHORT-TERM PROJECTS

The second phase of the TMP focuses on future projects through 2040. These are generally smaller projects that can be funded through conventional funding programs, although some larger roadway widening projects are included. Furthermore, several corridor and interchange studies are included, and these will generate additional projects. For Phase 2, these projects support existing deficiencies in the transportation system and also support future needs as the county is expected to continue growing. Lastly, Phase 2 also covers bicycle, pedestrian, and transit improvements throughout the County.

This short-term phase of the blueprint is broken into two parts:

Local Roadway Plan: Improvements to major arterial roadways throughout the County, such as Route 1, Route 610, Route 17, Route 3, and Route 218, that support safety and congestion needs. Additionally, other local collector roadways are also included with improvements on Courthouse Rd, Centreport Pkwy, Morton Rd, Poplar Rd, and Mountain View Rd.

Multimodal Plan: Projects that support increased multimodal accessibility for bicycles, pedestrians, and transit users. This plan is countywide and provides an analysis of existing accessibility to notable destinations. Infrastructure improvements support major gaps in the network and recommend additional studies be completed regarding transit agencies that serve Stafford County.

Over the past decade, many transportation studies and plans have been completed in Stafford County. These studies have generated numerous recommendations for improvements throughout the County. They have provided valuable guidance in helping to evaluate projects in Phase 2, and many of the recommended projects are from various studies completed in recent years that have not yet been prioritized for funding and added to the CIP. While the studies have provided valuable guidance in project evaluation, the TMP also identified that there are several corridors and intersections where additional study is needed. These recommendations are included in each corridor's Local Roadway Plan.

2.1 LOCAL ROADWAY PLAN

The Local Roadway Plan is an important aspect of the TMP Blueprint. This portion of the blueprint focuses on projects along major arterial roadways in Stafford County, such as Route 1, Route 610, Route 17, Route 3, and Route 218, as well as local collector roadways, such as Courthouse Rd, Centreport Pkwy, Morton Rd, Poplar Rd, and Mountain View Rd. Each roadway is an important thoroughfare and provides an important connection for county residents and businesses. This plan entails projects that are feasible to be funded through conventional funding programs like VDOT's Revenue Sharing and SMART SCALE funding programs.

2.1.1 US Route 1

US Route 1, otherwise known as Richmond Highway and Cambridge Street, traverses Stafford County north-south, from Prince William County near Quantico to the City of Fredericksburg near the Rappahannock River, running parallel to I-95. It is a major thoroughfare for the County connecting the population centers of North and South Stafford and Stafford Courthouse. In the tables below, each bar represents a roadway segments and the text is representative of roadway segments affected by the specific intersections noted.

Figure 1: Route 1 Annual Person Hours of Delay

The chart below shows congestion along the corridor in the southbound and northbound directions for each roadway segment. The segment with the most significant delay is at the Butler Road and Warrenton Road intersection, with notable issues also identified near Layhill Road, Enon Road, Courthouse Road, Garrisonville Road, and Telegraph Road. Delay at the Butler Road and Warrenton Road intersection is more than double that of any other intersections along Route 1 in the County.

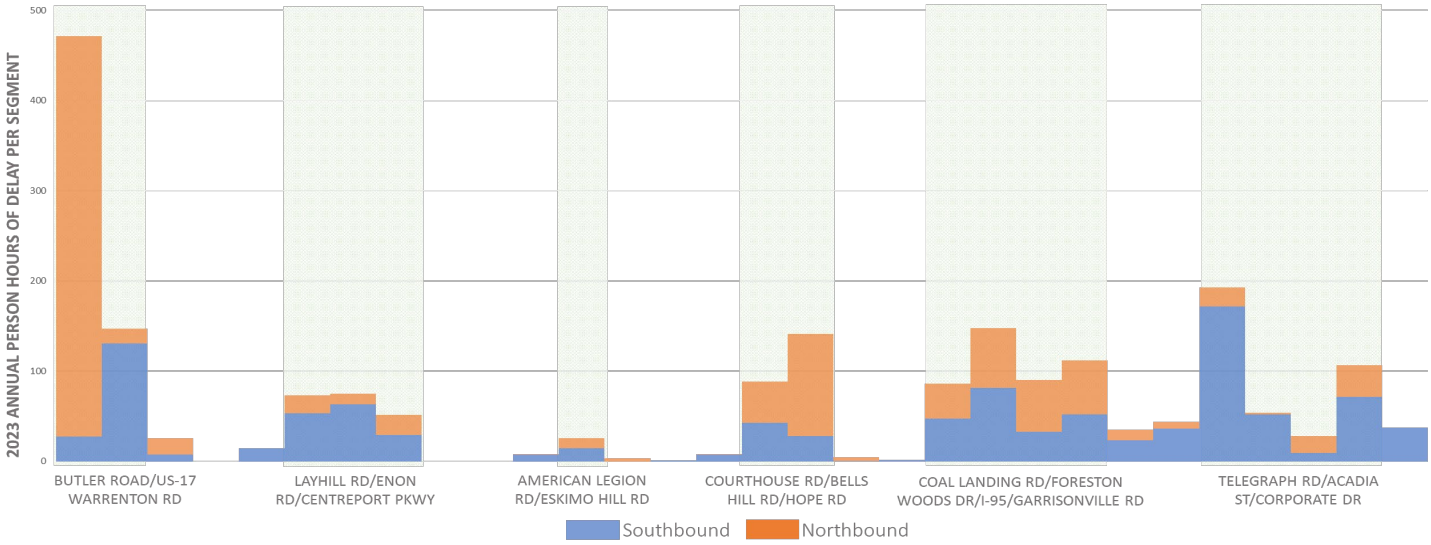
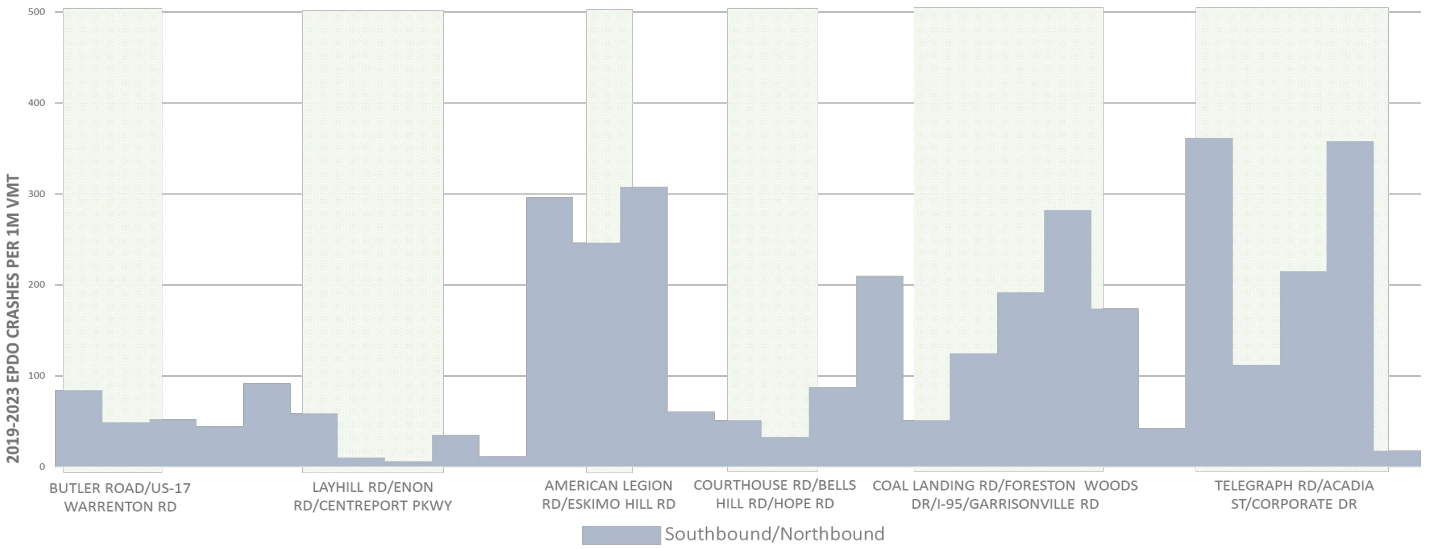


Figure 2: Route 1 Equivalent Property Damage Only (EPDO) Crashes Per 1 million VMT

The chart below shows congestion along the corridor combined in the southbound and northbound directions for each roadway segment. The segment with the most significant safety issues is near Telegraph Road and Acadia St, with notable issues also identified near American Legion Road and near Garrisonville Road. Safety issues along Route 1, as weighted by VMT, are more significant than other major roadways in the County, more than double that of Route 610 and Route 17.



TRANSPORTATION MASTER PLAN

Future growth in northern and southern Stafford County will increase congestion on Route 1. A model run of growth on the transportation network between 2019 and 2050 suggest that the total volume of vehicles on Route 1 by 2050 will nearly double in the north end of the County to nearly 50,000 vehicles per day and double in the southern end of the County to nearly 75,000 vehicles per day at Route 1 and Butler Road / Warrenton Road.

US Route 1 requires improvements to improve congestion and safety. At several notable intersections, projects are already underway in the engineering phase, other projects are funded but have not yet started engineering, some projects are conceptual and will be a future funding application, while two notable intersections require further study to study an interchange concept. The following table discusses the status of each intersection, its blueprint improvement, conceptual costs, and status.

The goal of the improvements is to be cost-beneficial and make a notable improvement to congestion and delay along the corridor. Each of the corridor projects are noted in the table below (**Table 3**). The next steps include continuing with engineering and moving toward construction on several projects, including improvements at Layhill Road, Enon Road, American Legion Road/Eskimo Hill Road, Courthouse Road, Bells Hill Road/Hope Road, and Telegraph Road. Furthermore, conceptually, projects at Centreport Pkwy, Coal Landing Road, and Foreston Woods Drive will be future applications to VDOT SMART SCALE and Revenue Sharing programs. Lastly, studies will be completed for the Garrisonville Road/I-95 interchange, and further environmental study is needed at the Butler Road/Warrenton Road intersection.

Table 3: Route 1 Corridor Blueprint

Intersection	Improvement	Cost
Butler Road / Warrenton Road	Interchange	$ 100,000,000
Layhill Road	Turn Lanes (Project identified in Phase 1)	$ 15,000,000
Enon Road	Turn Lanes and Enon Road Widening (Project Identified in Phase 1)	$ 26,000,000
Centreport Parkway	Interchange	$ 36,000,000
American Legion Road / Eskimo Hill Road	Turn Lanes (Project identified in Phase 1)	$ 4,200,000
Courthouse Road	Turn Lanes (Project Identified in Phase 1)	$ 26,000,000
Bells Hill Road / Hope Road		
Coal Landing Road	Turn Lanes	$ 12,000,000
Foreston Woods Drive	Turn Lanes	$ 10,000,000
I-95 / Garrisonville Road	Interchange	$ 100,000,000
I-95 / Coachman Circle	Access Management	$ 40,000,000
Potomac Hills Drive	Turn Lanes	$ 16,000,000
Telegraph Road	Turn Lanes (Project Identified in Phase 1)	$ 12,000,000
Woodstock Lane		

2.1.2 Route 610

Route 610, otherwise known as Garrisonville Road, traverses North Stafford County east-west, from Fauquier County near Brent Town Road and Aquia Road to US Route 1 near I-95 and Aquia Harbour. It is a major thoroughfare for the County, connecting rural areas in the west to the commercial center of Stafford Market Place in the east near I-95. In the tables below, each bar represents a roadway segments and the text is representative of roadway segments affected by the specific intersections noted.

Figure 3: Route 610 Annual Person Hours of Delay

The chart below shows congestion along the corridor in the eastbound and westbound directions for each roadway segment. The segment with the most significant delay is at the Mine Road and Staffordboro Boulevard intersection, with notable issues also identified near Route 1 and I-95, Stafford Market Place, Onville Road, Shelton Shop Road, and Tech Parkway. The segment of Garrisonville Road, between Route 1 and Shelton Shop Road, averages the most total delay in the county.

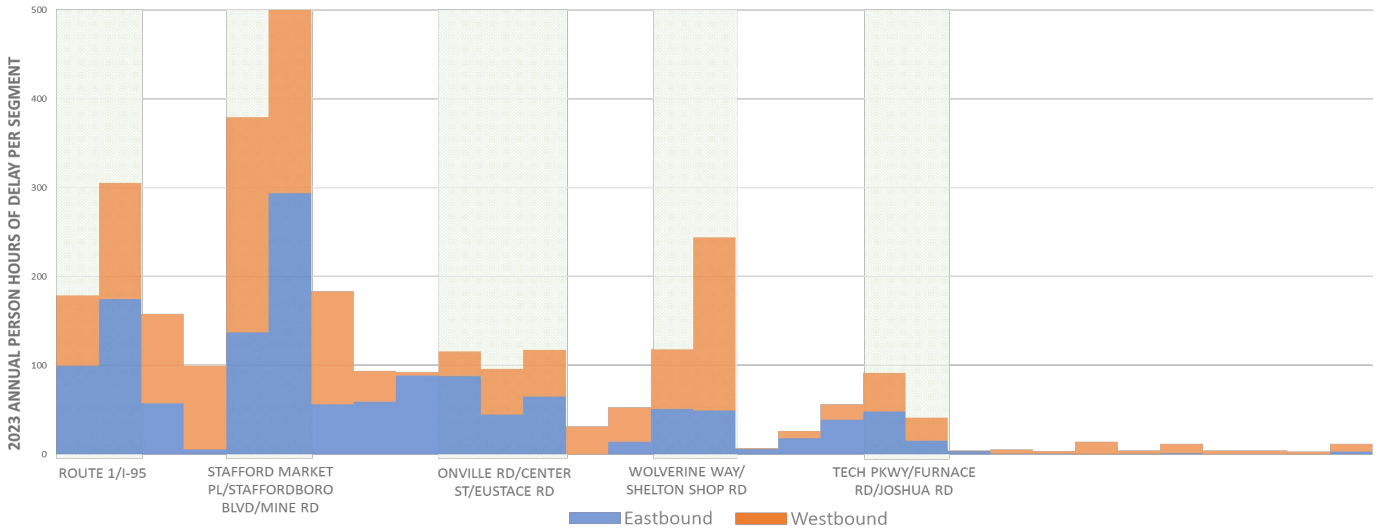
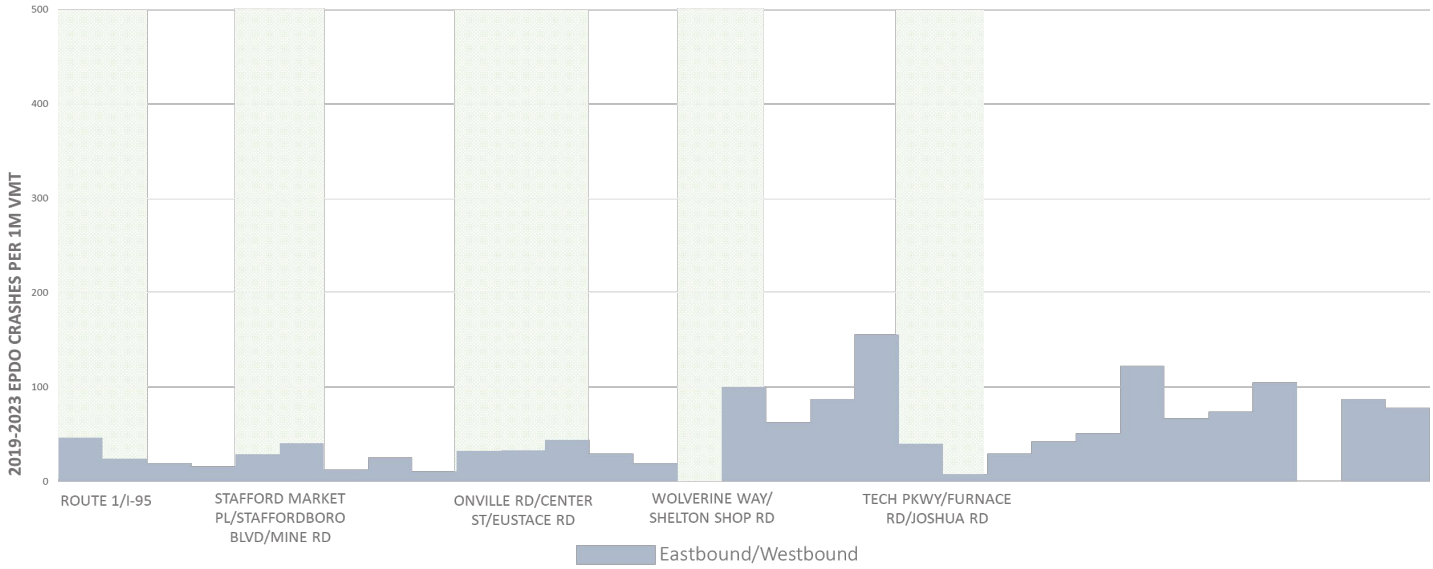


Figure 4: Route 610 Equivalent Property Damage Only (EPDO) Crashes Per 1 million VMT

The chart below shows safety along the corridor combined in the eastbound and westbound directions for each roadway segment. The segment with the most significant safety issues is between Shelton Shop Road and Tech Parkway, with notable issues also identified in the western portions of the corridor where the roadway goes from 4-2 lanes surrounded by primarily rural land uses.



Future growth in northern Stafford County will increase congestion along Route 610. A model run of growth on the transportation network between 2019 and 2050 suggest that the total volume of vehicles on Route 610 by 2050 near I-95 and Route 1 will increase by 20% to over 92,000 vehicles per day.

Route 610 requires improvements to improve congestion and safety. At several notable intersections, significant study is required in order to identify improvements that will support the identified needs. One project is already in the conceptual phase: the Garrisonville Road Widening from Eustace Road to Shelton Shop Road, as identified in the 2019 Transportation Bond. Due to cost, however, this project has been split into two phases at Parkway Boulevard and is estimated to cost over $100 million. The following table discusses the status of each intersection, its blueprint improvement, conceptual costs, and status.

The goal of the improvements is to be cost-beneficial and make a notable improvement to congestion and delay along the corridor. The next steps include working towards funding for the aforementioned Garrisonville Road Widening projects between Eustace Road and Shelton Shop Road. Furthermore, studies will be completed along several sections of Garrisonville Road, including at the I-95 interchange between Route 1 to Mine Road for congestion and safety improvements, along the segment between Shelton Shop Road and Joshua Road for safety improvements, and along the segment between Joshua Road and the Fauquier County Line for safety improvements.

Table 4: Route 610 Corridor Blueprint

Intersection	Improvement	Cost
I-95 / US Route 1	Interchange	$ 100,000,000
Eustace Road to Parkway Boulevard	Widening	$ 72,000,000
Parkway Boulevard to Shelton Shop Road	Widening	$ 40,000,000
Shelton Shop Road to Joshua Road	Study Required	Not identified
Joshua Road to Fauquier County Line	Study Required	Not identified

2.1.3 Route 17

US Route 17/17 Business, otherwise known as Warrenton Road, traverses South Stafford County east-west, from Fauquier County near Timberidge Drive at Deep Run to US Route 1 and Butler Road in Falmouth. It is a major thoroughfare for the County, connecting rural areas in the west to commercial centers near Berea at Celebrate VA Pkwy and others near I-95. In the tables below, each bar represents a roadway segments and the text is representative of roadway segments affected by the specific intersections noted.

Figure 5: Route 17 Annual Person Hours of Delay

The chart below shows congestion along the corridor in the eastbound and westbound directions for each roadway segment. The segment with the most significant delay is near the Banks Ford Pkwy and Celebrate VA Pkwy Intersections, with notable issues also identified near Route 1 and Butler Road, and near I-95 NB/SB. While significant traffic uses Route 17 to access I-95, most of the delays are not near I-95 but are further down the corridor at commercial space near Celebrate VA Pkwy.

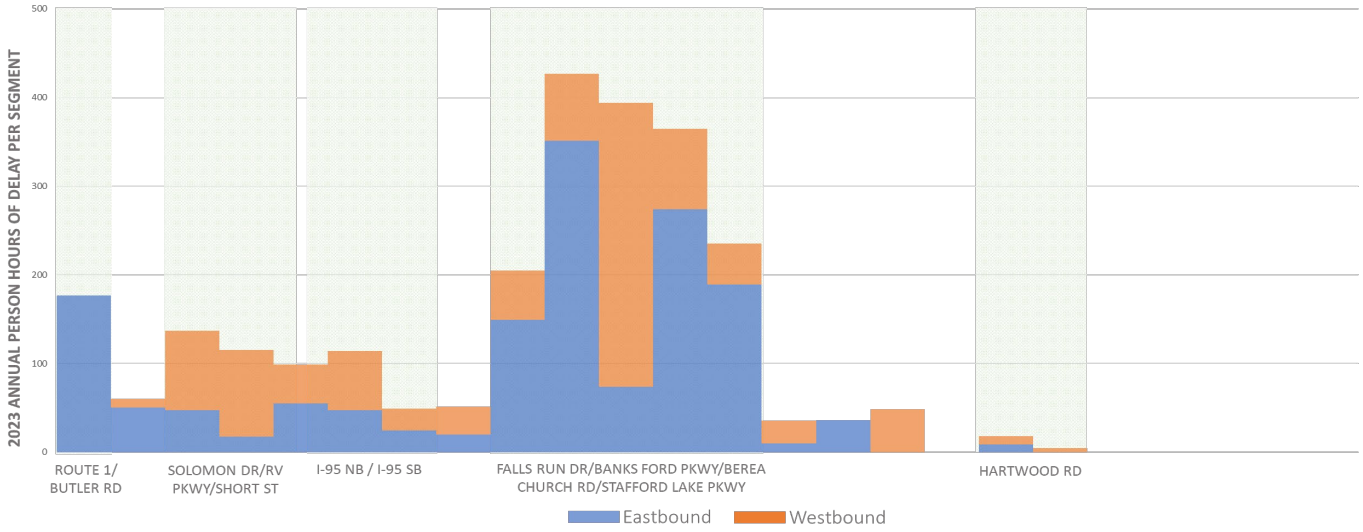
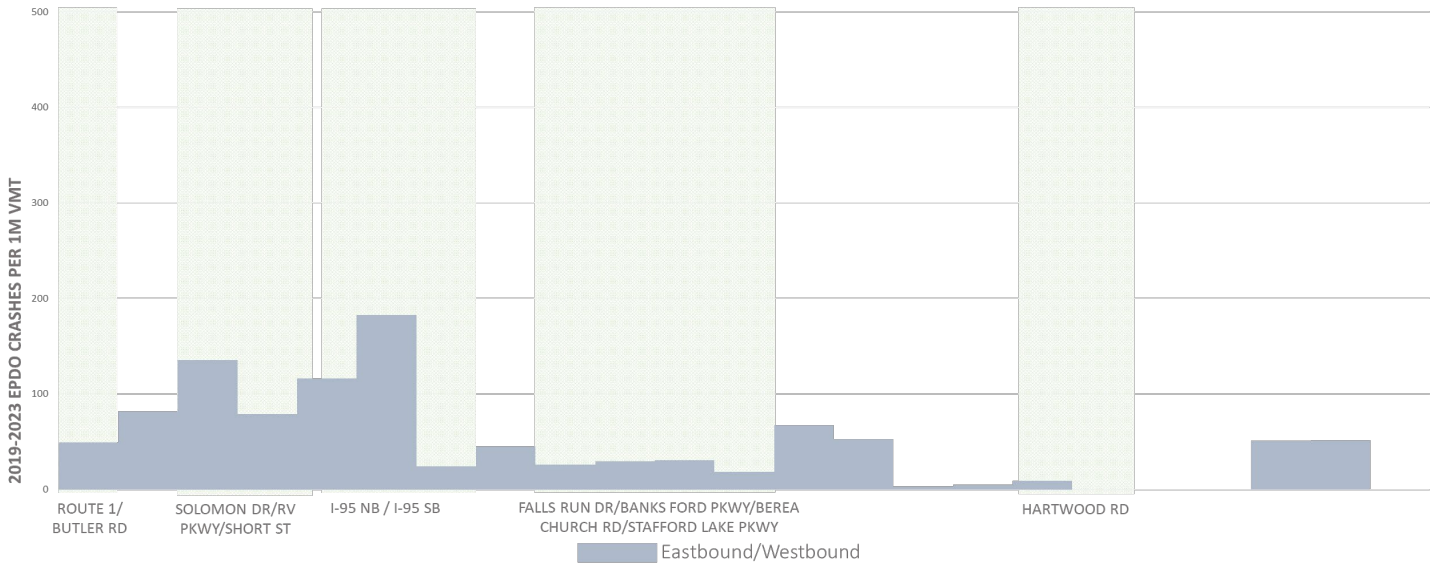


Figure 6: Route 17 Equivalent Property Damage Only (EPDO) Crashes Per 1 million VMT

The chart below shows safety along the corridor combined in the eastbound and westbound directions for each roadway segment. The segment with the most significant safety issues is at the I-95 NB and SB on/off ramps, with notable issues also identified in eastern portions of the corridor between I-95 and Solomon Drive and in far western portions of the corridor in rural segments past Hartwood Road.



Future growth in southern Stafford County will increase congestion along Route 17. A model run of growth on the transportation network between 2019 and 2050 suggest that the total volume of vehicles on Route 17 by 2050 will increase by nearly 20% to over 90,000 vehicles per day and could potentially growth further west by upwards of 50% near Village Pkwy.

Route 17 requires improvements to improve congestion and safety. At several notable intersections, significant study is required in order to identify improvements that will support the identified needs. One project is already under construction by VDOT, which are the improvements at the I-95 NB and SB on/off ramps. While these improvements are underway, a study may be needed after to ascertain their success in reducing congestion and safety issues. Another project is just east of I-95 at RV Pkwy, where engineering is underway to realign the intersection. The following table discusses the status of each intersection, its blueprint improvement, conceptual costs, and status.

The goal of the improvements is to be cost-beneficial and make a notable improvement to congestion and delay along the corridor. The next steps include completing construction on the improvements at I-95 and completing engineering and starting construction for the improvements at RV Pkwy. Furthermore, studies will be completed along several sections of Warrenton Road, including at the Route 1/Butler Road intersection, for further environmental study of an eventual interchange, also between South Gateway Dr to Stafford Lakes Pkwy for congestion and safety improvements, and further west in rural portion of the corridor for safety improvements.

Table 5: Route 17 Corridor Blueprint

Intersection	Improvement	Cost
Route 1 / Butler Road / Warrenton Road	Interchange	$ 100,000,000
RV Parkway / Olde Forge Drive	Realignment	$ 11,000,000
I-95 NB / I-95 SB	Interchange	Not Identified
Stafford Lakes Parkway to Village Parkway	Road Widening	$ 30,000,000
South Gateway Drive to Stafford Lakes Parkway	Study Required	Not Identified
Village Parkway to Fauquier County Line	Study Required	Not Identified

2.1.4 Route 3

Route 3, otherwise known as Kings Highway, traverses Stafford County west-east, from the City of Fredericksburg at the Chatham Bridge to Kings George County at Muddy Creek. It is a major thoroughfare connecting the City of Fredericksburg and southern Stafford County to US 301 and the Northern Neck. In the tables below, each bar represents a roadway segments and the text is representative of roadway segments affected by the specific intersections noted.

Figure 7: Route 3 Annual Person Hours of Delay

The chart below shows congestion along the corridor in the eastbound and westbound directions for each roadway segment. The segment with the most significant delay is near the Walmart just past Blue Gray Pkwy, with potential issues also identified at Blue Gray Pkwy, Ferry Road, and Chatham Heights Rd. While there are no significant instances of delay, future growth will cause increases in delay.

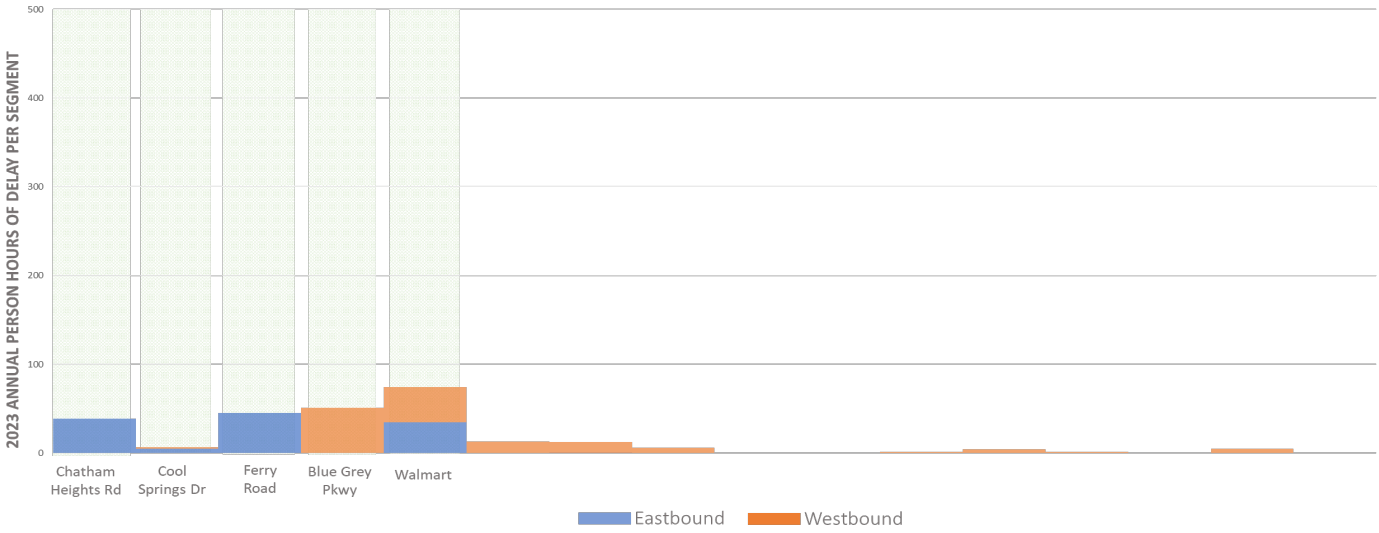
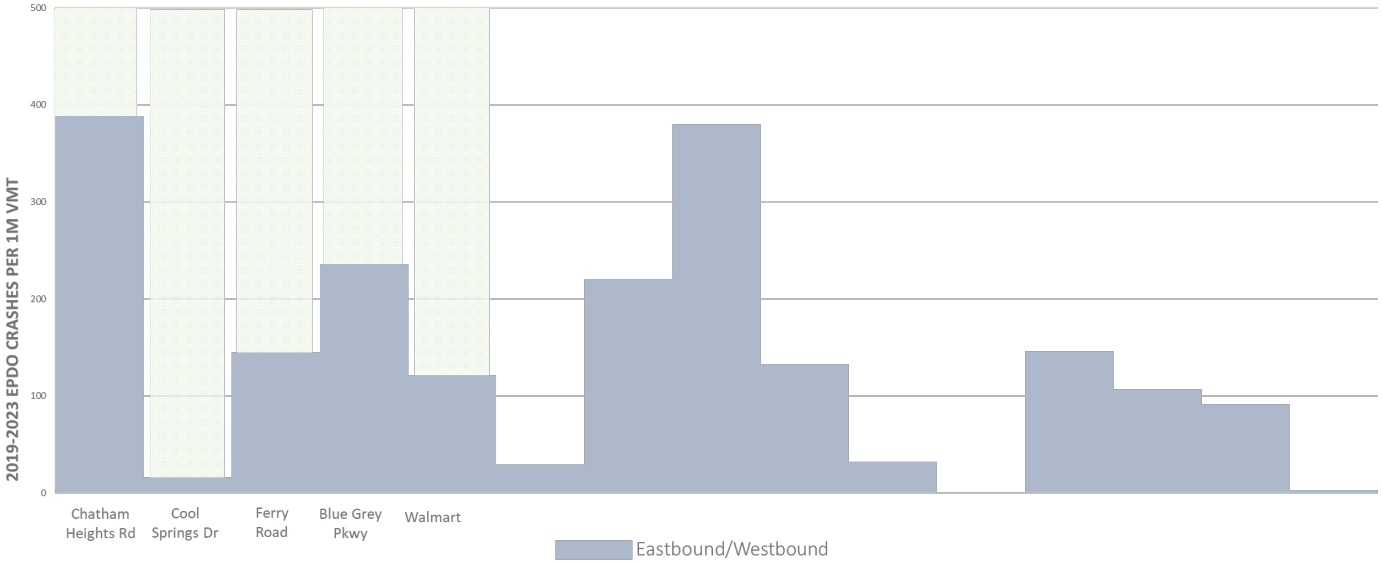


Figure 8: Route 3 Equivalent Property Damage Only (EPDO) Crashes Per 1 million VMT

The chart below shows safety along the corridor combined in the eastbound and westbound directions for each roadway segment. The segment with the most significant safety issues is at Chatham Heights Rd and in rural sections of Route 3 past Walmart, where traffic is free-flowing. Notable issues have also been identified at Ferry Road, Walmart, and Blue Gray Pkwy. Segments with significant safety issues are comparable to safety issues seen along free-flowing sections of Route 1 in central Stafford County.



Future growth in southern Stafford County will increase congestion along Route 3. A model run of growth on the transportation network between 2019 and 2050 suggests that the total volume of vehicles on Route 3 by 2050 will increase by nearly 15% to over 35,000 vehicles per day.

Route 3 requires improvements to safety, especially along rural sections of the corridor. There are no notable congestion concerns during normal traffic operations when compared to other major roadways in the County; however, notable traffic concerns are possible when there are closures and accidents on I-95, as Route 3 at the Blue-Gray Parkway is one of four crossings of the Rappahannock River. No notable projects are currently underway along the corridor; however, improvements at Ferry Road were completed in the last five years, and a new bridge was constructed over the Rappahannock River just past Chatham Heights Rd. A corridor study focusing on safety concerns is recommended along the whole length of the corridor to ascertain if any improvements can be made at signalized intersections and what types of rural safety improvements can be made.

The goal of the improvements is to be cost-beneficial and make notable improvements to safety along the corridor. The next steps include studying the corridor to determine what types of cost-beneficial safety improvements can be made.

Table 6: Route 3 Corridor Blueprint

Intersection	Improvement	Cost
Chatham Heights Road to King George County	Study Required	Not Identified

2.1.5 Route 218

Route 218, otherwise known as Butler Rd and White Oak Rd, traverses Stafford County west-east, from King George County near Passapatanzy to Route 1/US-17 Business in Falmouth. It is a major thoroughfare for residents in southeastern Stafford County connecting to Route 1, I-95, Route 17, and the City of Fredericksburg. In the tables below, each bar represents a roadway segments and the text is representative of roadway segments affected by the specific intersections noted.

Figure 9: Route 218 Annual Person Hours of Delay

The chart below shows congestion along the corridor in the eastbound and westbound directions for each roadway segment. The segment with the most significant delay is at Chatham Heights Rd, with notable issues also observed at Deacon Rd. Furthermore, while significant issues are not observed at Route 1, other directions at this intersection experience significant delays, especially during peak hours.

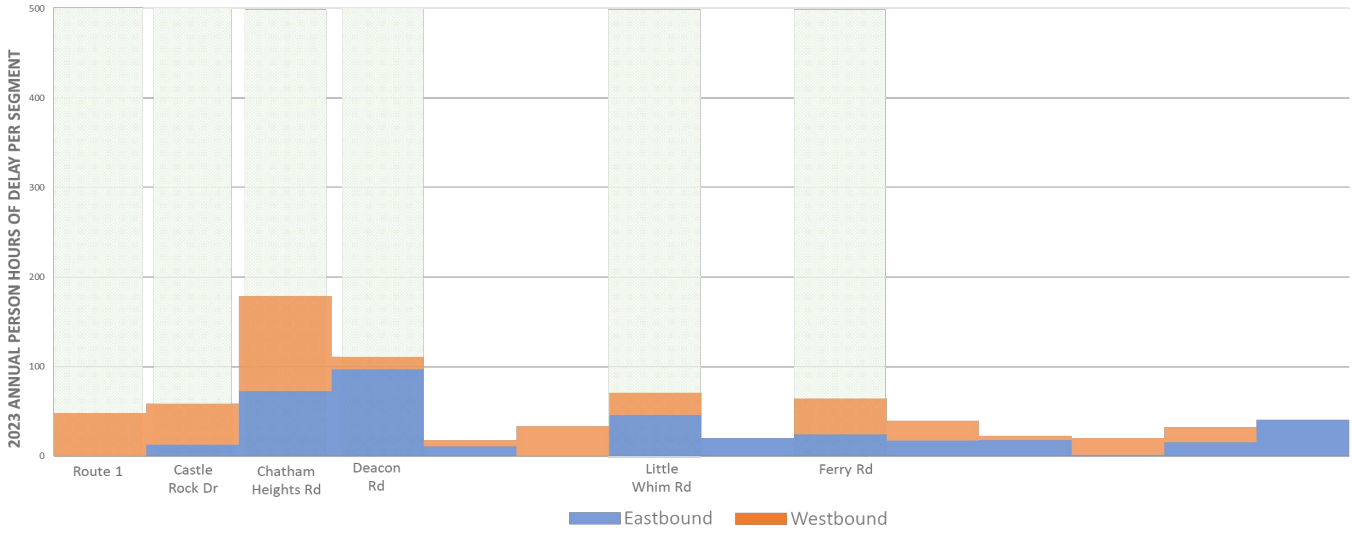
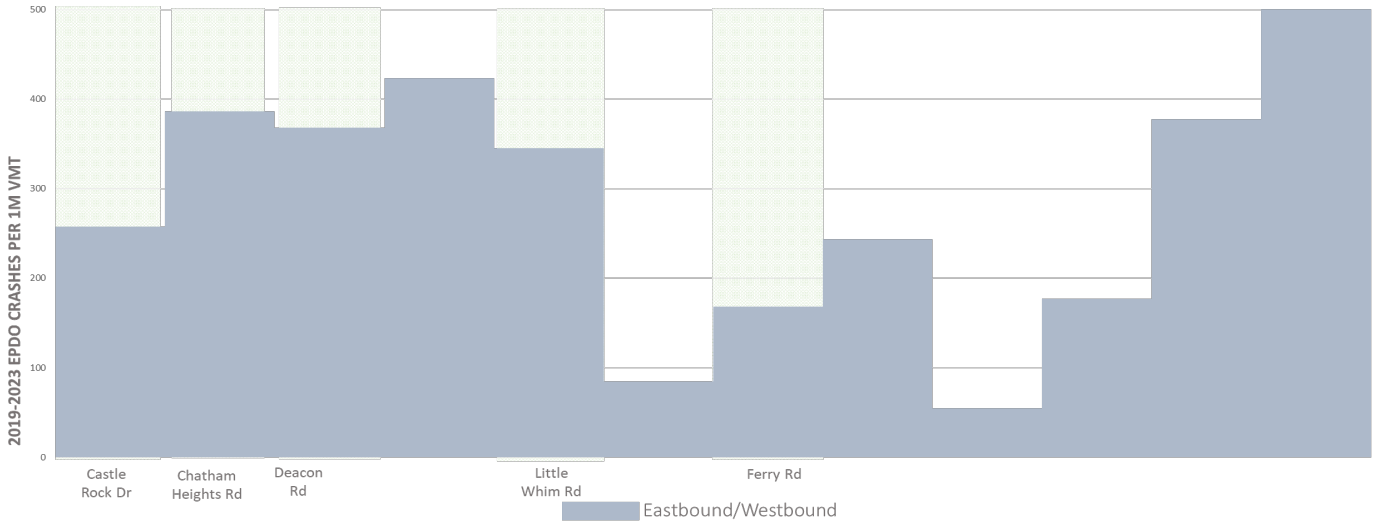


Figure 10: Route 218 Equivalent Property Damage Only (EPDO) Crashes Per 1 million VMT

The chart below shows safety along the corridor combined in the eastbound and westbound directions for each roadway segment. The segment with the most significant safety issues is in rural Stafford County near the King George County line. Furthermore, significant safety issues are observed between Castle Rock Dr and Little Whim Rd, nearly half the length of the corridor.



Future growth in southern Stafford County will increase congestion along Route 218. A model run of growth on the transportation network between 2019 and 2050 suggests that the total volume of vehicles on Route 218 by 2050 will increase by nearly 20% to over 22,000 vehicles per day.

Route 218 requires improvements to congestion and safety along a majority of the corridor. There are congestion concerns between Route 1 and Deacon Rd, where a portion of the roadway is only two lanes and is currently near capacity. As suggested by the long-term travel demand model, Butler Rd may need to be widened to four lanes to handle additional traffic as the County continues to grow. Furthermore, safety is a significant issue along a majority of the corridor, especially in the rural segment near King George County. Recently, VDOT completed additional safety improvements near this section that should help reduce the safety issues noted. However, a corridor study is recommended to cover Deacon Rd to past Ferry Rd to understand concerns and potential improvements for congestion and safety.

The goal of the improvements is to be cost-beneficial and make notable improvements to safety along the corridor. The next steps include studying the corridor to determine what types of cost-beneficial safety improvements can be made. Further, a widening through the recently completed Butler Rd Corridor Study is recommended between Route 1 and Castle Rock Dr.

Table 7: Route 218 Corridor Blueprint

Intersection	Improvement	Cost
Carter Street to Castle Rock Drive	Roadway Widening	$90,000,000
Deacon Road to past Ferry Road	Study Required	Not Identified

2.1.6 Collector Plan

The Collector Plan encompasses miscellaneous smaller projects throughout the County that have been identified through the TMP process but are not located on a previously mentioned major corridor. These are projects that support future growth and improve existing safety issues. They have been identified in prior VDOT studies, through the 2019 Transportation Bond, and relate to future schools (High School #6, Elementary School #18, and Elementary School #19).

Table 8: Collector Corridor Blueprint

Intersection	Improvement	Cost
Mountain View Road and Kellogg Mill Road	Roundabout	$15,000,000
Courthouse Rd at Stafford Ave and Hospital Center Boulevard	Roundabout	$10,000,000
I-95 Exit 136/Centreport Parkway	Turn Lanes	$50,000,000
Poplar Road and Truslow Road	Turn Lane	$2,000,000
Morton Road and Forbes Street	Turn Lane	$2,000,000
Truslow Road near Summer Breeze Lane	Low-Cost Safety	$1,250,000

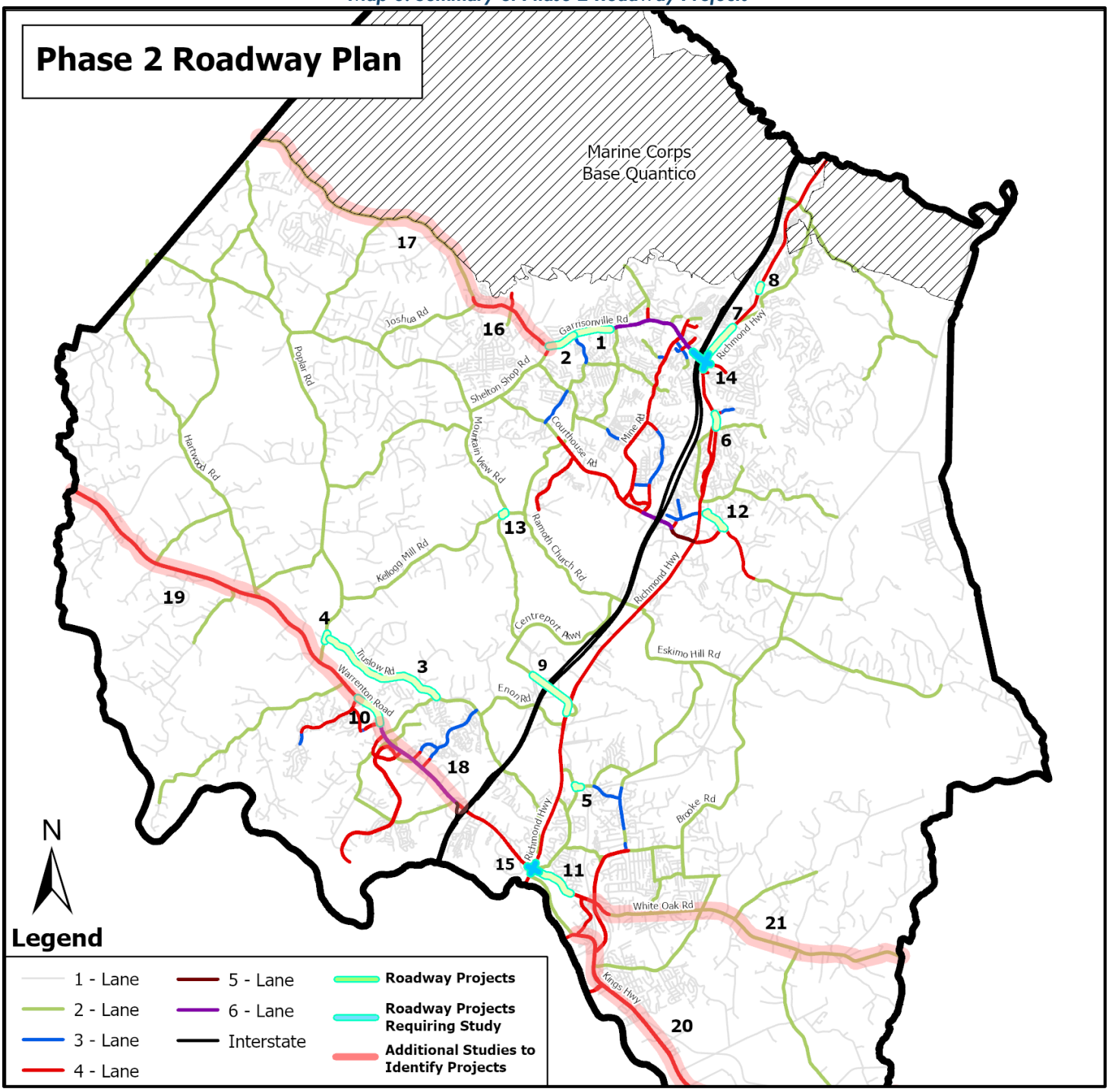
2.1.7 Summary of Phase 2 Roadway Projects

Located in **Table 9**, eighteen total projects are recommended in the Phase 2 Roadway Plan (numbered in green). Furthermore, six standalone studies are recommended to help determine additional projects for inclusion in the Phase 2 Roadway Plan (numbered in red). Two projects overlapping projects types in the plan include the required environmental and interchange studies required at US Route 1 and Butler Road / Warrenton Road and US Route 1 at I-95 and Garrisonville Road (numbered in blue). These are each referred to as interchange projects where a project type has been identified; however, additional study is required before they can move forward.

Table 9: Summary of Phase 2 Roadway Projects

ID	Intersection	Improvement	Cost
1	**Garrisonville Road Phase 1 at Eustace Road to Parkway Boulevard**	Road Widening	$72,000,000
2	**Garrisonville Road Phase 2 at Parkway Boulevard to Shelton Shop Road**	Road Widening	$40,000,000
3	**Truslow Road (US Route 1 to Poplar Road)**	Corridor Safety	$1,250,000
4	**Poplar Road and Truslow Road**	Turn Lanes	$2,000,000
5	**Morton Road and Forbes Street**	Turn Lanes	$2,000,000
6	**US Route 1 at Foreston Woods Drive and Coal Landing Road**	Turn Lanes	$22,000,000
7	**US Route 1 at I-95 NB and Coachman Circle**	Access Management	$40,000,000
8	**US Route 1 at Potomac Hills and US Route 1 Corridor**	Turn Lanes / Safety	$16,000,000
9	**I-95 Exit 136 and Centreport Parkway to US Route 1**	Interchange	$86,000,000
10	**Warrenton Road at Stafford Lakes Parkway to Village Parkway**	Road Widening	$30,000,000
11	**Butler Road at Carter Street to Castle Rock Drive**	Road Widening	$90,000,000
12	**Courthouse Road Corridor (Stafford Avenue and Hospital Center Blvd)**	Corridor Safety	$10,000,000
13	**Mountain View Road and Kellogg Mill Road**	Roundabout	$15,000,000
14	**US Route 1 at I-95 / Garrisonville Road**	Interchange	$100,000,000
15	**US Route 1 at Butler Road / Warrenton Road**	Interchange	$100,000,000
16	**Garrisonville Road at Shelton Shop Road to Joshua Road**	Corridor Study	N/A
17	**Garrisonville Road at Joshua Road to Fauquier County Line**	Corridor Study	N/A
18	**Warrenton Road at South Gateway Drive to Stafford Lakes Parkway**	Corridor Study	N/A
19	**Warrenton Road at Village Parkway to Fauquier County Line**	Corridor Study	N/A
20	**Route 3 at Chatham Heights Road to Kings George County Line**	Corridor Study	N/A
21	**Route 218 at Deacon Road to past Ferry Road**	Corridor Study	N/A

Map 3: Summary of Phase 2 Roadway Projects



2.2 MULTIMODAL PLAN

The Multimodal Plan prioritizes the need and importance of developing a safe, comprehensive, and connected regional network of on-road and off-road pedestrian and bicycled corridors and transit infrastructure. Creating this network begins with a comprehensive understanding of the existing corridors and infrastructure and it requires filling in gaps and creating more multimodal connections.

This portion of the plan is broken into four sections, three for bicycle and pedestrian facilities; one for North Stafford, one for South Stafford, one for the Stafford Heritage Trail, and one for transit service and facilities. More specifically, the bicycle and pedestrian portion of the multimodal plan is broken into north and south Stafford due to funding constraints. Due to its connection with the Washington D.C. Urban Area, northern Stafford County receives a set-aside of funding for bicycle and pedestrian improvements.

North Stafford Bicycle and Pedestrian Plan: This plan entails recommendations for bicycle and pedestrian facilities in North Stafford County. This area is encompassed by the North Stafford Urban Area as defined by the US Census Bureau as being a part of the greater Washington D.C. Urban Area. Approximately 90,000 residents live in northern Stafford County in the suburban neighborhoods located generally north of Courthouse Road along Route 610, and U.S. Route 1.

South Stafford Bicycle and Pedestrian Plan: This plan entails recommendations for bicycle and pedestrian facilities in South Stafford County. This area is encompassed by the Fredericksburg Urban Area as defined by the US Census Bureau as including southern Stafford County, the City of Fredericksburg, and portions of Spotsylvania County. Approximately 40,000 residents live in southern Stafford County in the suburban neighborhoods located off of U.S. 17, Route 218, and Route 3.

Stafford Heritage Trail Plan: This plan entails recommendations for trails throughout Stafford County that would improve access, mobility, and recreational opportunities for people walking and biking. The trail could also serve as the missing link of the Potomac Heritage National Scenic Trail, and connect various cultural and natural resources in the county. While trails are generally a recreational opportunity, they can provide vital access and mobility opportunities for County residents just as roadway, sidewalk, and transit infrastructure provide.

Transit Plan: This plan entails recommendations for transit facilities and service improvements throughout Stafford County. While the plan includes all of Stafford County, generally, transit services the urban areas in North and Stafford County. Transit services include local buses with FXBGO!, commuter buses with OmniRide, commuter rail with Virginia Railway Express, and ridesharing and vanpooling with GWRideConnect.

Accessibility is an important component of any multimodal plan. Access can be measured by average accessibility to destinations for jobs and other non-work opportunities along the bicycle and pedestrian network or through transit facilities and services. An increase in access to destinations through a multitude of travel choices and a sign of transportation efficient infrastructure and land use.

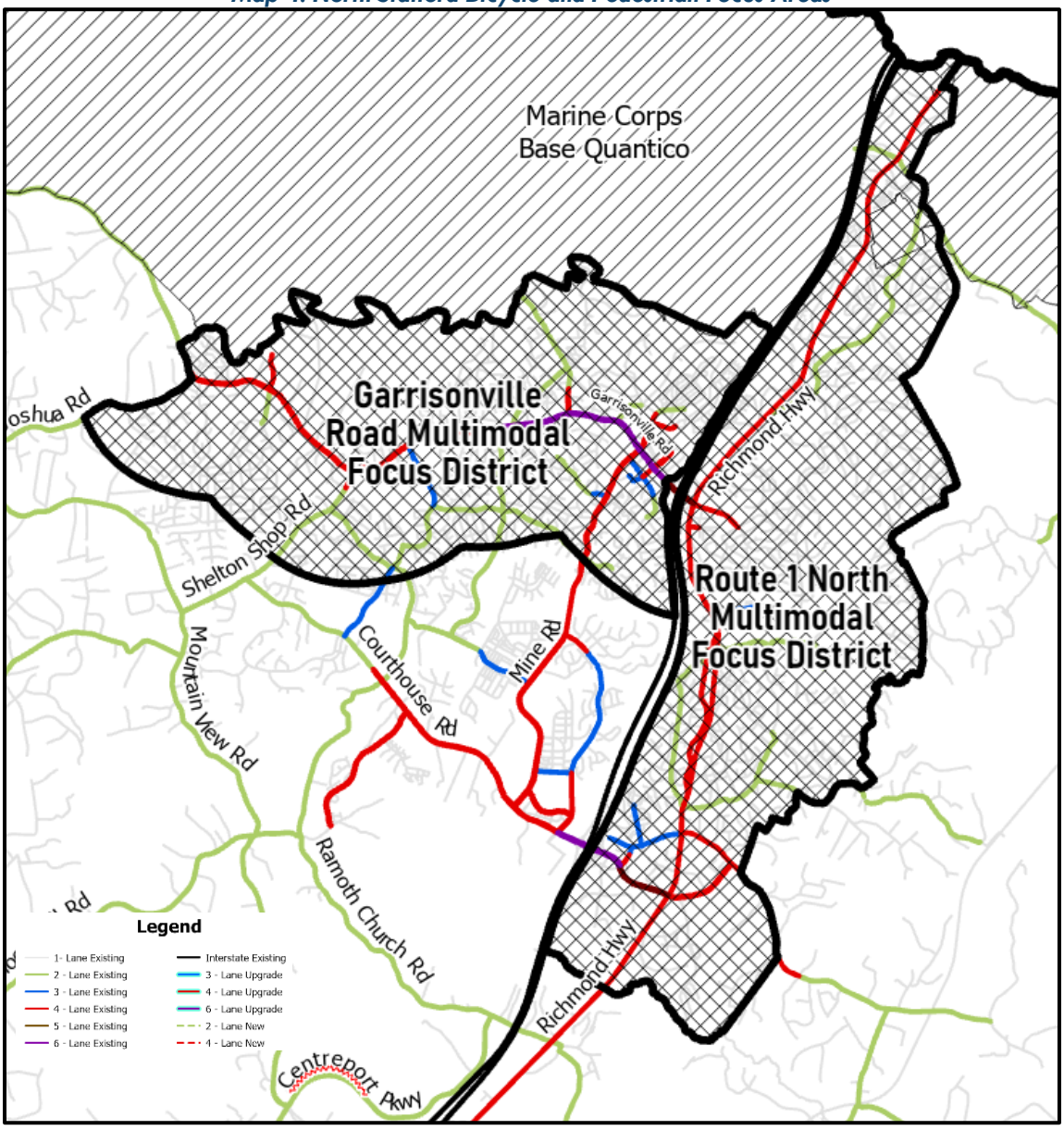
The Multimodal Plan uses a measure of accessibility that includes access to destinations on a parcel-by-parcel basis to help evaluate the importance of increasing bicycle, pedestrian, and transit connections. These destinations include destination types such as banks, education, entertainment, grocery, healthcare, food and drink, public services, recreation, and shopping. Through an analysis of the multimodal network, these facilities are counted within one mile of each parcel and used to provide an index of existing access to destinations.

2.2.1 North Stafford Bicycle and Pedestrian Plan

The Bicycle and Pedestrian Plan for North Stafford County encompasses the urbanized area of approximately 90,000 residents. Primarily centered around communities along Garrisonville Road, Courthouse Road, and U.S. Route 1, this region is a part of the greater Washington D.C. Urbanized Area and receives a set-aside in funding for bicycle and pedestrian projects at approximately $500,000 a year through the TAP and STBG programs. These funding sources provide a unique opportunity for this area to continue to fund bicycle and pedestrian projects with limited local funding amounts.

Investments in multi-modal transportation, notably improved pedestrian and bicycle facilities, can go a long way to improving mobility. These relatively low-cost investments provide residents an alternative to driving, offer recreation opportunities, and help support compact, sustainable development. In order to better understand needs in North Stafford, the area can be broken into two study areas (**Map 4**); one along Garrisonville Road and covering the surrounding Garrisonville Road Service District and one along Route 1 covering the corridor and its surrounding neighborhoods including Stafford Courthouse and Aquia Harbour.

Map 4: North Stafford Bicycle and Pedestrian Focus Areas



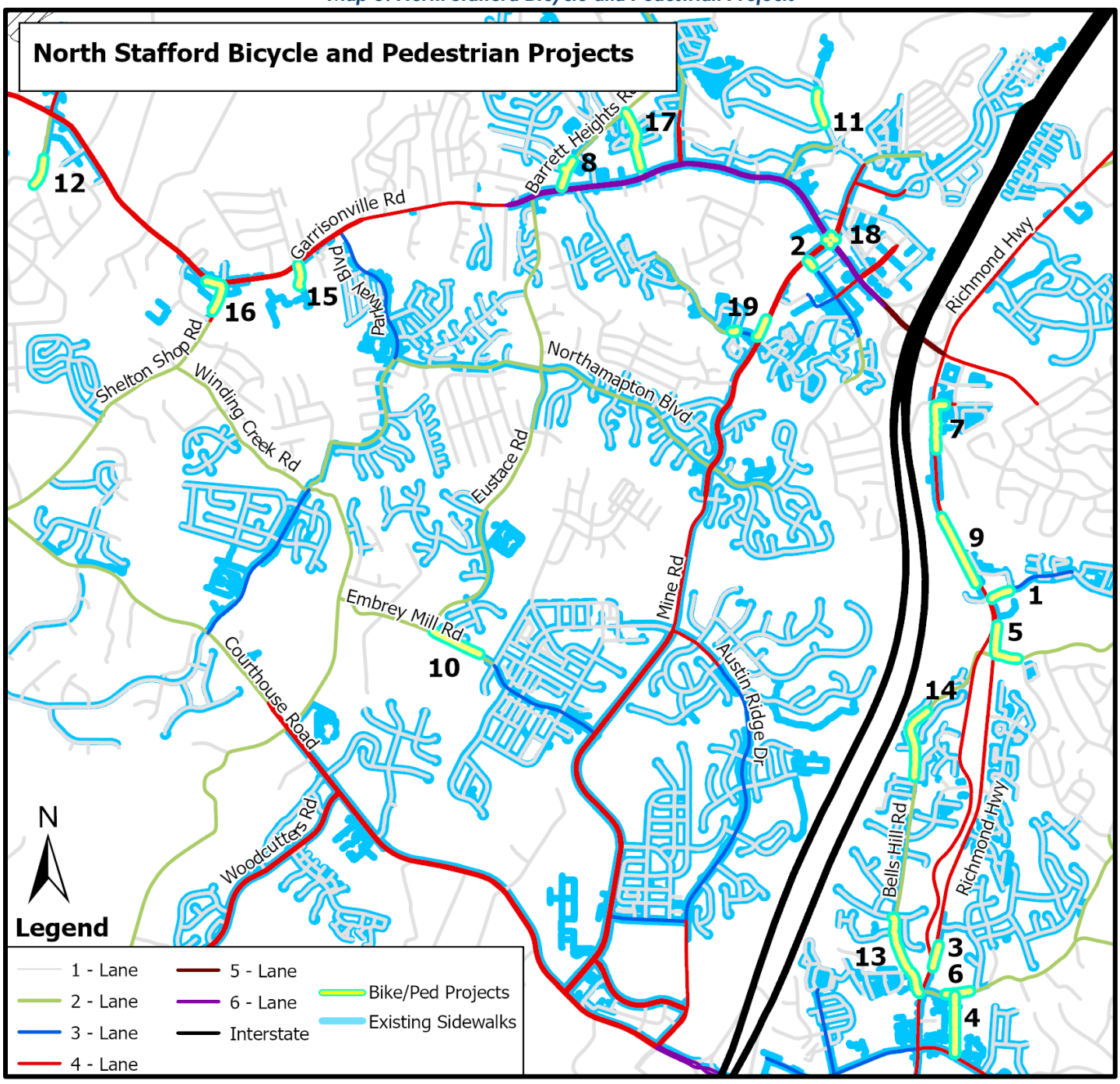
Through the TMP Study, 30 bicycle and pedestrian projects were identified as gaps in the multimodal network where additional sidewalks or shared-use paths are needed. Of those 30 projects, 17 are located in North Stafford and are in **Table 10** and on **Map 5**. One study has been completed in this area recently, and that is the Garrisonville Road Multimodal Study; several projects were recommended through this study completed by the County. A similar detailed study of bicycle and pedestrian needs is recommended to be completed in the Route 1/Aquia Area to identify any additional needs (1).

In addition to sidewalk and shared-use path projects recommended in the Transportation Master Plan, of which many overlap with the Garrisonville Road Multimodal Study, the multimodal study also recommended improvements at notable intersections including at Garrisonville Rd and Mine Rd/Staffordboro Blvd and at Mine Rd and Highpointe Blvd.

Table 10: North Stafford Bicycle and Pedestrian Blueprint

ID	Access Area and Segment	Improvement	Cost
1	**Route 1: Foreston Woods Dr**	Sidewalk	$1,000,000
2	**Garrisonville: Mine Rd/Greenspring Dr**	Sidewalk	$500,000
3	**Route 1: Route 1 NB Landmark Ln**	Shared-Use Path	$2,700,000
4	**Route 1: Stafford Ave**	Sidewalk	$3,000,000
5	**Route 1: Coal Landing Rd at Route 1 Bridge**	Shared-Use Path	$10,000,000
6	**Route 1: Hope Rd**	Sidewalk	$1,500,000
7	**Route 1: Route 1 NB at Town Center Dr**	Shared-Use Path	$2,800,000
8	**Garrisonville: Barrett Heights Rd / Whitestone Dr**	Sidewalk	$1,700,000
9	**Route 1: Route 1 SB gaps north of Foreston Woods Dr**	Sidewalk	$3,200,000
10	**Garrisonville: Embrey Mill Dr /Eustace Rd**	Sidewalk	$3,000,000
11	**Garrisonville: Juggins Rd**	Sidewalk	$2,000,000
12	**Garrisonville: Furnace Dr**	Sidewalk	$1,700,000
13	**Route 1: Bells Hill Rd**	Shared-Use Path	$4,400,000
14	**Route 1: Bells Hill Rd at Galaway Ln to Bellflower Ln**	Shared-Use Path	$4,000,000
15	**Garrisonville: Wolverine Way at Garrisonville Rd**	Sidewalk	$1,400,000
16	**Garrisonville: Garrisonville Rd at Shelton Shop Rd**	Sidewalk	$1,900,000
17	**Garrisonville: Travis Ln**	Sidewalk	$2,900,000
18	**Garrisonville: Garrisonville Rd and Mine Rd/Staffordboro Blvd**	Crosswalks and Sidewalk	$1,000,000
19	**Garrisonville: Mine Rd and Highpointe Blvd**	Crosswalks and Sidewalk	$1,000,000
-	**Route 1: Bicycle and Pedestrian Gap Study**	Study	Not Identified

Map 5: North Stafford Bicycle and Pedestrian Projects

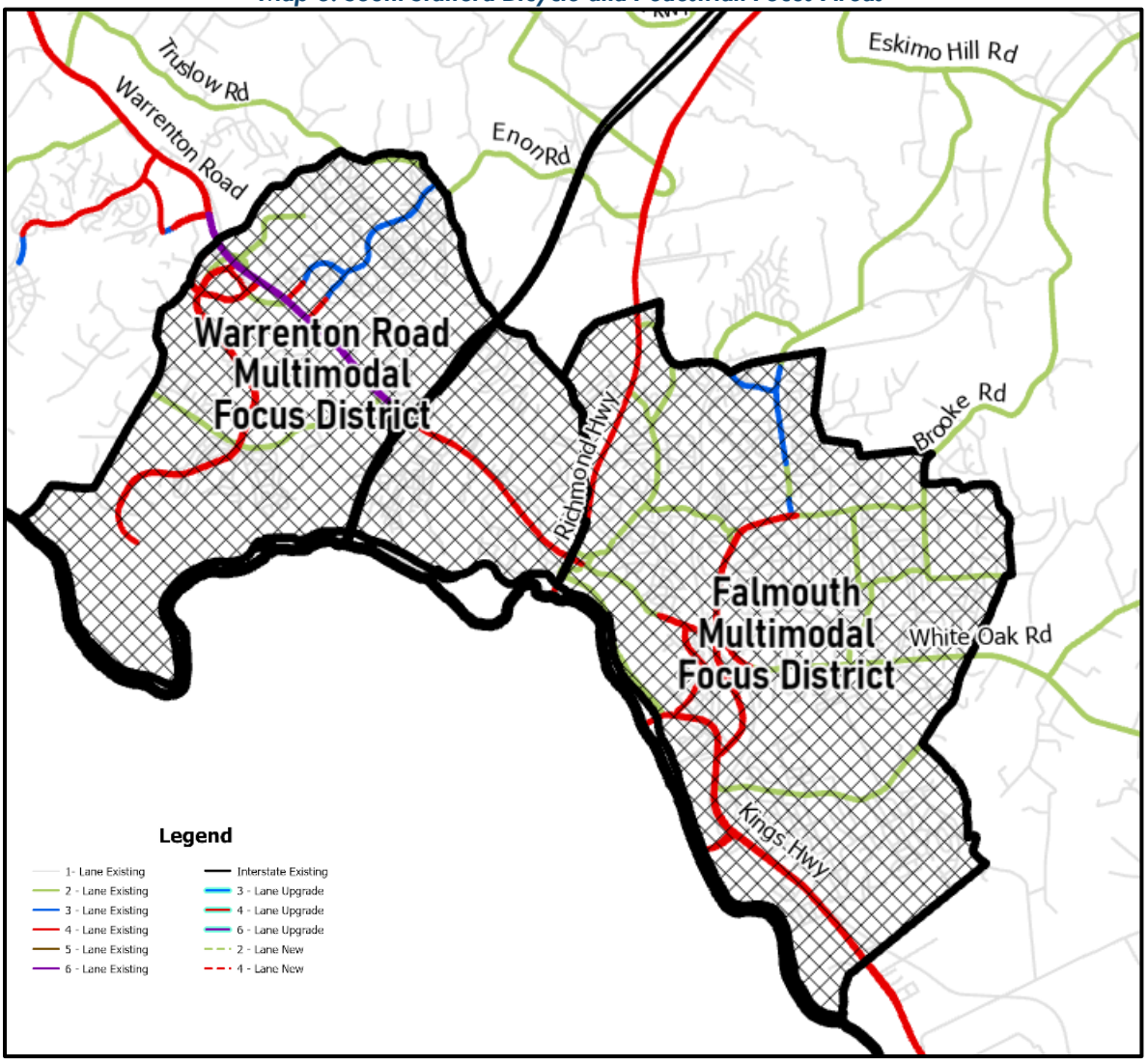


2.2.2 South Stafford Bicycle and Pedestrian Plan

The Bicycle and Pedestrian Plan for South Stafford County encompasses the urbanized area of approximately 40,000 residents. Primarily centered around communities along US-17, Route 3, and Route 218, this region is a part of the greater Fredericksburg Urban Area with a unique opportunity for future bicycle and pedestrian connections to the City of Fredericksburg over the Rappahannock River and throughout the park system adjacent to the river in the City of Fredericksburg and Stafford County.

Investments in multi-modal transportation, notably improved pedestrian and bicycle facilities, can go a long way to improving mobility. These relatively low-cost investments provide residents an alternative to driving, offer recreation opportunities, and help support compact, sustainable development. In order to better understand needs in South Stafford, the area can be broken into two study areas (**Map 6**); one along Warrenton Road (Route 17) and covering the surrounding Southern Gateway Targeted Development Area and one along Route 218 and Route 3 covering the corridor and its surrounding neighborhoods including Falmouth and White Oak.

Map 6: South Stafford Bicycle and Pedestrian Focus Areas



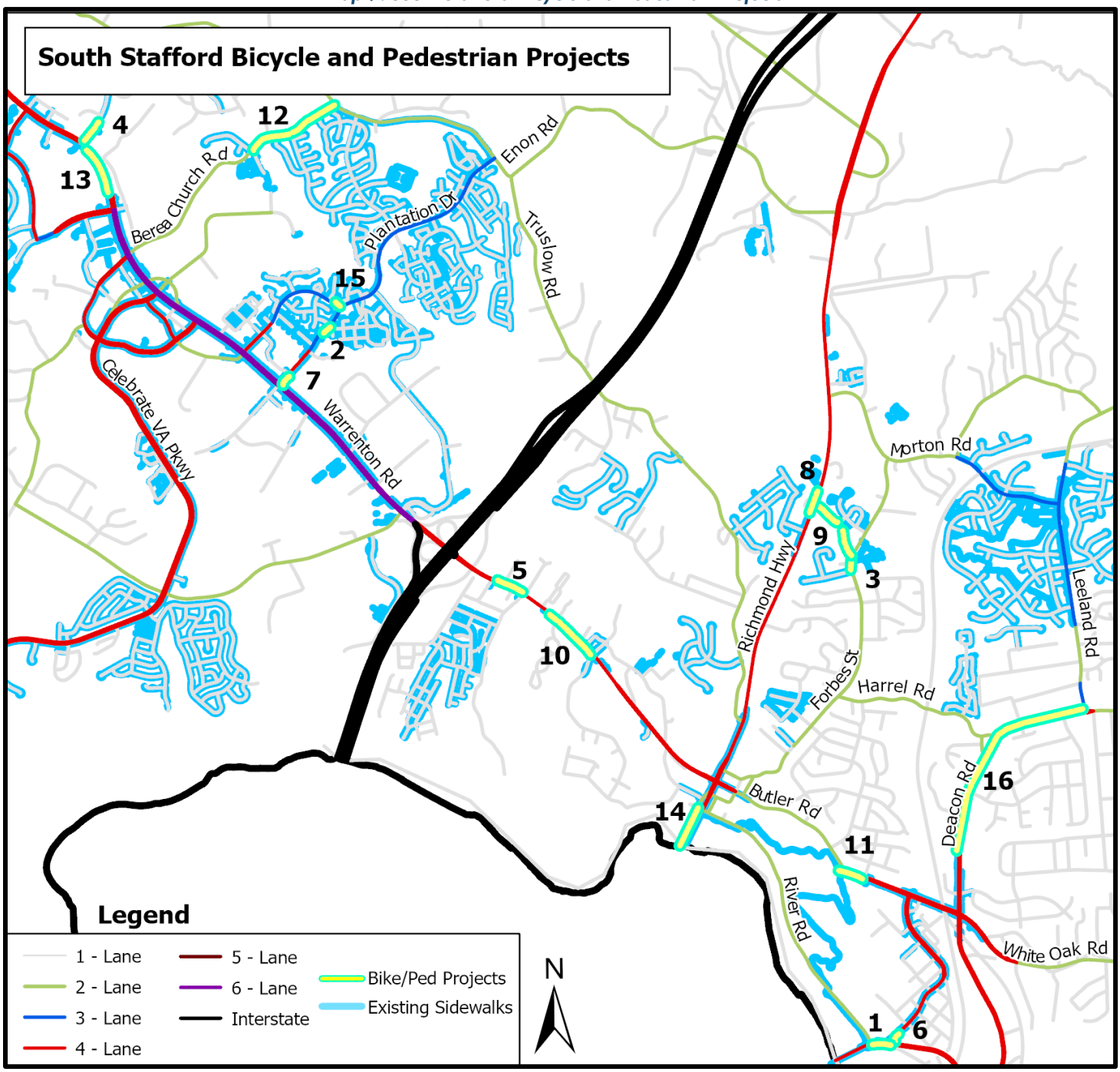
Through the TMP Study, 30 bicycle and pedestrian projects were identified as gaps in the multimodal network where additional sidewalks or shared-use paths are needed. Of those 30 projects, 13 are located in South Stafford and are in **Table 11** and on **Map 7**. One study has been completed in this area recently, and that is the Warrenton Road Multimodal Study; several projects were recommended through this study completed by the Virginia Secretary of Transportation Office of Intermodal Planning and Investment. A similar detailed study of bicycle and pedestrian needs is recommended to be complete in the Falmouth Area to identify any additional needs (1).

Furthermore, one project of regional significance is within the South Stafford Area, this would be the crossing over the Rappahannock River at Route 1 into the City of Fredericksburg. Adequate bicycle and pedestrian facilities are not currently in place on the bridge, and a new bridge with adequate bicycle and pedestrian facilities is recommended to be constructed.

Table 11: South Stafford Bicycle and Pedestrian Blueprint

ID	Access Area and Segment	Improvement	Cost
1	**Falmouth Area: Kings Hwy at Chatham Heights Rd**	Shared-Use Path	$1,000,000
2	**Route 17: Plantation Dr NB at Lancelot Ln**	Sidewalk	$1,200,000
3	**Falmouth Area: Forbes St/Sapphire Ct**	Sidewalk	$750,000
4	**Route 17: Cardinal Dr**	Sidewalk	$1,400,000
5	**Route 17: US-17 WB Near I-95 RV Pkwy**	Sidewalk	$2,200,000
6	**Falmouth Area: Chatham Heights Rd Gap**	Sidewalk	$1,100,000
7	**Route 17: Plantation Dr NB at US-17**	Sidewalk	$2,200,000
8	**Falmouth Area: Route 1/Southgate Dr/Drew MS**	Sidewalk	$1,600,000
9	**Falmouth Area: Manning Dr/Route 1**	Sidewalk	$3,000,000
10	**Route 17: US-17B EB at Quarles**	Sidewalk	$2,600,000
11	**Falmouth Area: Butler Rd/Castle Rock Dr/BFF**	Sidewalk	$1,700,000
12	**Route 17: Berea Church Rd near Truslow Rd**	Shared-Use Path	$3,500,000
13	**Route 17: US-17 EB Near Cardinal Dr**	Sidewalk	$3,300,000
14	**Regional: Route 1 Bridge**	Shared-Use Path	$30,000,000
15	**Route 17: Litchfield Blvd**	Sidewalk	$750,000
16	**Falmouth: Deacon Rd**	Sidewalk or Shared-Use Path	$7,500,000
17	**Falmouth Area: Bicycle and Pedestrian GAP Study**	Study	Not Identified

Map 7: South Stafford Bicycle and Pedestrian Projects



2.2.3 Stafford Heritage Trailways Plan

The Heritage Trail encompasses planned trails throughout Stafford County that would improve access, mobility, and recreational opportunities for people walking and biking.

The trail can also serve as the missing link of the Potomac Heritage National Scenic Trail, and connect various cultural and natural resources in the county.

Stafford County is rich in cultural and natural resources; including the boyhood home of George Washington at Ferry Farm, the historic home of Chatham Manor, the Stafford County Civil War Park, Belmont the historic home of Gari Melchers, Government Island, Patawomeck Park, and many more facilities. All of these cultural resources are important to the history of Stafford County and many are unique in their location allowing for connections by trails for walking and biking opportunities.

A study of the Stafford Heritage Trail is underway (**Map 8**) and will recommend a general alignment through Stafford County east of I-95. Furthermore, an alignment west of I-95 will be a part of the Western Network recommended in section 3.2.1 of the TMP.

Map 8: Stafford Heritage Trail

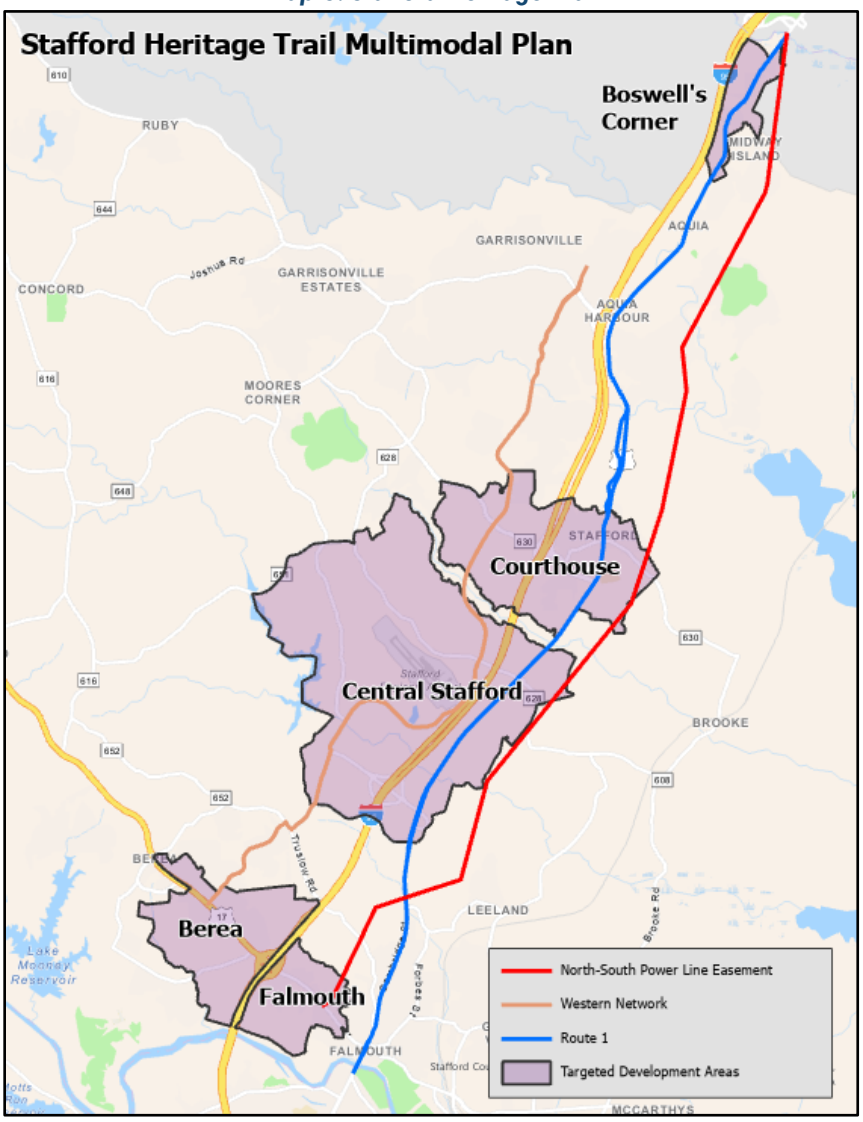


Table 12: Stafford Heritage Trail Blueprint

Access Area and Segment	Improvement	Cost
North-South Countywide Trail (Prince William County to City of Fredericksburg)	Shared-Use Path	N/A
Belmont-Ferry Farm Trail Phase 6	Shared-Use Path	$5,000,000
Coal Landing Rd / Route 1 to Government Island Trail	Shared-Use Path	$7,500,000
Rappahannock River Scenic Trail	Unpaved Trail	N/A
Hospital Center Blvd to Civil War Park Trail	Shared-Use Path	$10,000,000

2.2.4 Transit Plan

Four agencies support and operate transit in the greater Fredericksburg region. All include operations and support services in Stafford County. These include GWRideConnect, a ridesharing support agency; Virginia Railway Express (VRE), which operates commuter rail; and FXBGO! which operates local buses; and OmniRide, which operates commuter buses. Except for FXBGO! the other three agencies either support or operate services for commuters north to Washington, D.C. Ridership on FXBGO!, OmniRide, and VRE for FY2023 was over 400,000 riders with 112,000 using OmniRide, 56,000 using FXBGO!, and nearly 250,000 using VRE (**Figure 11**).

The TMP transit plan does not wholly emphasize a list of specific recommendations for major changes to the transit agencies; moreover, as three of four agencies are currently completing a new strategic plan, future work will be guided by County priorities and the agencies' strategic plans.

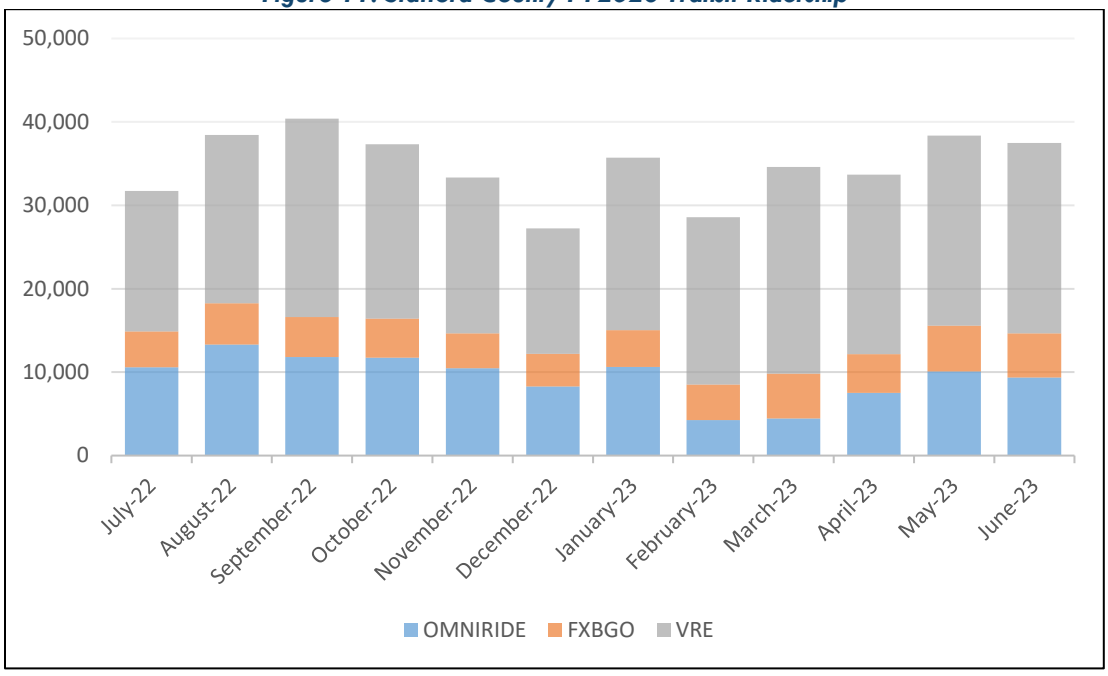
FXBGO! operates out of the City of Fredericksburg and currently services five routes within the county covering approximately 90 miles including services in both North and South Stafford County and a service connecting to the City of Fredericksburg. Recommendations for improvements include faster service from 60-minute to 30-minute headways and amenity enhancements at high-ridership bus stops.

VRE operates two commuter rail stations in Stafford County and provides service from Spotsylvania County to Union Station in Washington D.C. VRE is currently undergoing a strategic plan for VRE 2040; however, recommendations for improvements from the TMP include high-speed rail and infrastructure upgrades depending on ridership needs at the two county VRE stations.

OmniRide operates out of Prince William County and provides routes to three Stafford County Park and Ride lots, including Staffordboro and Mine Rd in North Stafford, Courthouse Rd in North Stafford, and the US-17 Park and Ride lot in South Stafford. Recommendations for improvement include amenity enhancements at Park and Ride lots depending on ridership needs.

GWRideConnect assists with connecting people with carpooling, vanpooling, and transit options in Stafford County. Primarily, they support vanpools and other carpooling services, including slugging. Recommendations for improvement include amenity enhancements at Park and Ride lots depending on ridership needs.

Figure 11: Stafford County FY2023 Transit Ridership



3 PHASE 3 LONG-TERM PROJECTS

3.1 FUTURE LAND USE

The Stafford County Comprehensive Plan defines future land use (**Map 9**) in the County. It is a key element guiding the physical form of the County by directing the location, type, and intensity of land uses. The Plan was been developed after considering factors such as existing development patterns and conditions, the potential for existing land use regulations to accommodate projected growth, and opportunities and constraints.

The *Land Use Plan* has been developed on the premise that much of the projected 20 years of future growth can occur within the previously established Urban Services Area with minimal expansion, given the amount of available vacant and underutilized land and previously approved but unbuilt projects. Considering development on infill parcels or other parcels in close proximity to existing development will maximize the efficiency of existing infrastructure and services.

Land use is an important element of any transportation, just as transportation is an important element of any land use plan. They are interrelated, and how land is used affects how the public moves between home, shopping, work, school, and elsewhere. As a result of expanded land use, traffic on roads also increases. Improving existing roads and constructing new ones can help reduce congestion and improve safety. Furthermore, changes in land use can help to alleviate existing issues in the transportation system. This includes the construction of new commercial uses in other areas of the County to help move traffic to different roadways that can handle additional capacity.

All phases of the TMP blueprint support the land use plan as adopted by the Board of Supervisors in 2021. The phases recommend future projects to support further development in the Urban Services Area. To help understand the future transportation system, the Travel Demand Model managed by VDOT was updated for the TMP. This model analyzes the performance of county roadways in relation to future land use through 2050 and helps to identify needed capacity upgrades to support future growth.

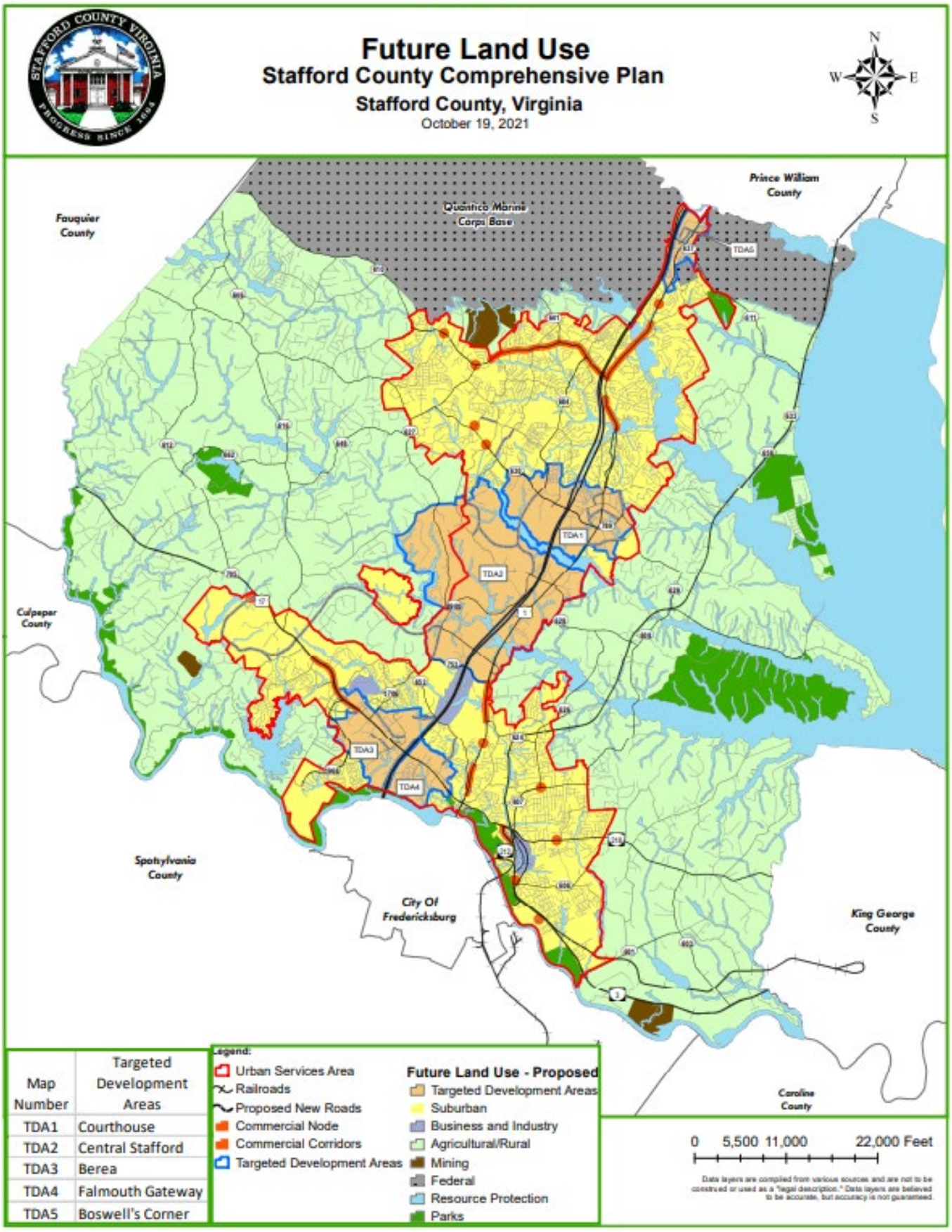
The TMP Study identified nine scenarios that have the potential to support future growth and reduce its impact on the performance of county roadways. Each of these scenarios identified capacity improvements along roadways in the Urban Services Area and modeled their performance through 2050; additional details can be found in the TMP Study; however, a summary table is found below (**Table 13**) showing the percent reduction in lane miles that are over capacity. Recommended scenarios to move forward are within *Section 3.2 Local Roadway Plan* and *Section 3.3 Regional Roadway Plan* and include Scenarios 5, 6 and 8.

Table 13: Future Modelled Scenarios

AM Peak Period Lane Mile Analysis		
Model Run	Impact On Congestion	Cost Estimate (magnitude)
Scenario 1	+1%	$ 251,452,200
Scenario 2	-1%	$ 690,472,400
Scenario 3	+9%	$ 250,631,200
Scenario 4	-1%	$ 461,173,600
Scenario 5	-3%	$ 348,541,000
Scenario 6	-12%	$ 668,841,000
Scenario 7	0%	$ 603,280,200
Scenario 8	-6%	$ 124,392,600
Scenario 9	-9%	$ 371,947,600

PM Peak Period Lane Mile Analysis		
Model Run	Impact On Congestion	Cost Estimate (magnitude)
Scenario 1	-4%	$ 251,452,200
Scenario 2	-1%	$ 690,472,400
Scenario 3	+3%	$ 250,631,200
Scenario 4	-3%	$ 461,173,600
Scenario 5	+1%	$ 348,541,000
Scenario 6	-10%	$ 668,841,000
Scenario 7	-7%	$ 603,280,200
Scenario 8	-8%	$ 124,392,600
Scenario 9	-9%	$ 371,947,600

Map 9: Stafford County Future Land Use Plan



Map Number	Targeted Development Areas
TDA1	Courthouse
TDA2	Central Stafford
TDA3	Berea
TDA4	Falmouth Gateway
TDA5	Boswell's Corner

3.2 LOCAL ROADWAY PLAN

3.2.1 Western Network

Network of north-south roadways west of I-95 to provide additional north-south capacity and alternatives to I-95 and Route 1. Locally, to function more efficiently, the County needs more options for travel. The Western Network is a network of roads that is a localized network to suit localized travel needs, but can still impact the regionwide transportation network. The recommended projects are of a significant size; however, the projects have a considerable impact on congestion and may be better suited to be funded outside of conventional funding streams such as through changes in land use, by developers or through legislative action.

The TMP Study modeled future growth in land use and it's impacts on the transportation network through 2050. Through the study, the *Western Network* was identified in Scenario 5 and Scenario 6 as having a significant impact on congestion countywide; specifically, with the inclusion of a new river crossing over the Rappahannock River (**3.3.1 Rappahannock River Crossing**), with a significant localized impact.

Mapped in **Map 10** and in **Table 14** is the *Western Network* projects. Recommended projects include a widening to four lanes or construction of a new four lane roadway of all selected roads. However, a phased approach could be completed where project #6 the *Enon Road Connector* is constructed as a two-lane roadway and future capacity is constructed with future development. The map depicts potential locations for new roadways; these are to be considered conceptual and subject to change pending further study.

Map 10: Western Network

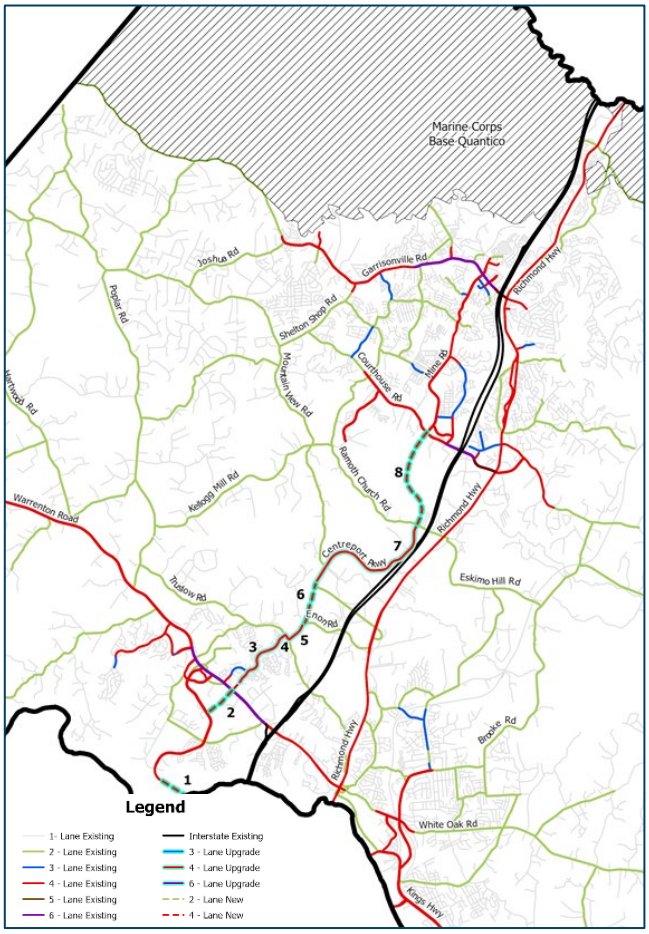


Table 14: Western Network Blueprint

#	Roadway
1	Rappahannock River Crossing
2	Commerce Parkway
3	Plantation Drive
4	Truslow Road
5	Enon Road
6	Enon Road Connector
7	Centreport Parkway
8	Mine Road Extension
Estimated Local Cost: $670,000,000	

3.2.2 Localized Widenings

Network of roadways in north-western Stafford County, including Courthouse Rd, Shelton Shop Rd, and Mountain View Rd that, with future growth, are projected to be over capacity. Locally, to function more efficiently, the widening of each of these roads from two to four lanes would alleviate future congestion and provide more options for travel.

The recommended projects will be a significant undertaking; however, they will have a considerable impact on congestion in north-western Stafford County, helping to alleviate potential capacity issues in Route 610. The projects have a considerable impact on congestion and may be better suited to be funded outside of conventional funding streams, such as through changes in land use, by developers, or through legislative action.

The TMP Study modeled future growth in land use and its impacts on the transportation network through 2050. Through the study, the *Localized Widenings* were identified in Scenario 8 as having a significant impact on congestion countywide, with an even more significant localized impact.

Mapped in **Map 11** and in **Table 15** is the *Localized Widenings* projects. Recommended projects include a widening to four lanes for all three. Improvements at the same location as project #2 the *Shelton Shop Road Widening,* are currently underway; however, these improvements will make way and help lead to a future widening of Shelton Shop Road.

Map 11: Localized Widenings

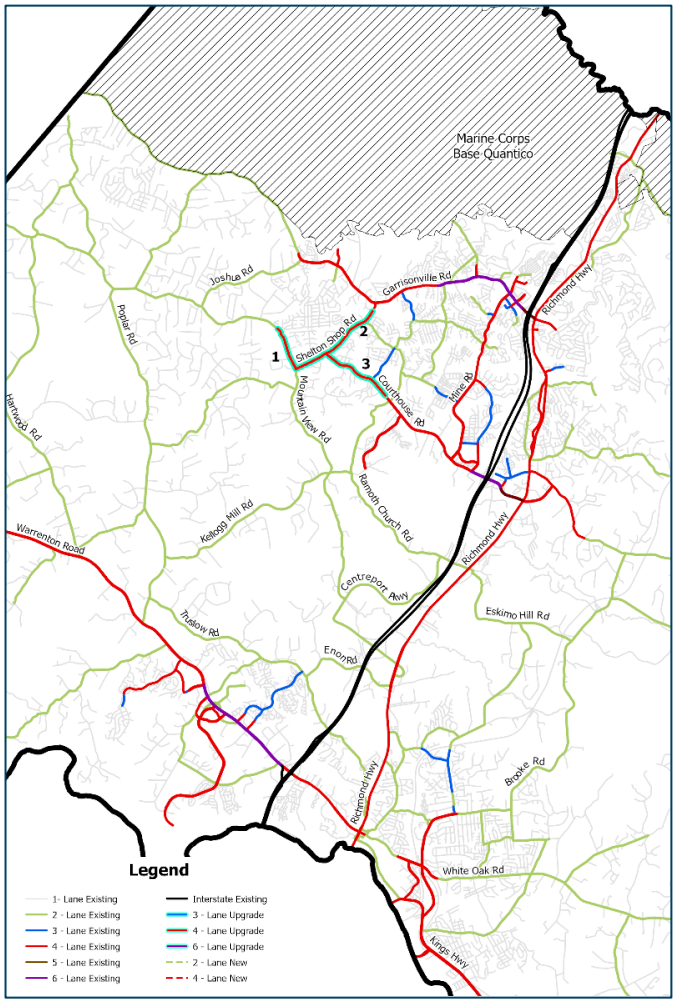


Table 15: Localized Widenings Blueprint

#	Roadway
1	Mountain View Road
2	Shelton Shop Road
3	Courthouse Road
Estimated Total Cost: $120,000,000	

3.2.3 Other Major Roadway Scenarios

The Transportation Master Plan Study studied additional roadway scenarios. While the previously mentioned scenarios in 3.2.1(Scenario 5 and Scenario 6) and 3.2.2 (Scenario 8) are priorities, the additional scenarios studied should also be completed in the future, depending on need, funding, and county growth. The recommendations from each of those scenarios are in the table below, and additional details can be found in the Transportation Master Plan Study.

Table 16: Roadway Project Scenarios

Scenario 1	
Intersection or Segment	**Improvement**
Plantation Drive	Roadway Widening
Truslow Road	Roadway Widening
Layhill Road Connector	New Roadway
Layhill / Primmer House Road	Roadway Widening
Leeland Road	Roadway Widening
Butler Road	Roadway Widening

Scenario 2	
Intersection or Segment	**Improvement**
Leeland Connector	New Roadway
Leeland Road	Roadway Widening
Butler Road	Roadway Widening
Stafford Parkway	New Roadway
Berea Church Road Connector	New Roadway
Enon Road Connector	New Roadway
Centreport Pkwy	Roadway Widening

Scenario 3	
Intersection or Segment	**Improvement**
Leeland Connector	New Roadway
Leeland Road	Roadway Widening
Centreport Pkwy	Roadway Widening

Scenario 4	
Intersection or Segment	**Improvement**
Stafford Parkway	New Roadway
Berea Church Road Connector	New Roadway
Enon Road Connector	New Roadway
Centreport Pkwy	Roadway Widening

Scenario 7	
Intersection or Segment	**Improvement**
Western Parkway	New Roadway
Shelton Shop Road	Roadway Widening
Garrisonville Road	Roadway Widening
Woodcutters Road	New Roadway

Scenario 9	
Intersection or Segment	**Improvement**
Foreston Woods Connector	New Roadway
Walpole Street	Roadway Widening
I-95 Auxilary / CD Lanes	New Roadway

3.3 Regional Roadway Plan

3.3.1 Rappahannock River Crossing

Today, there is no roadway crossing over the Rappahannock River west of I-95 until Kellys Ford over 22 miles away in Culpepper County. A new bridge over the river has been discussed regionally since the 1970s, with significant movement and several proposals between the late 1990s and the early 2010s. However, the construction of a new bridge did not move forward. More recently, discussion has been renewed between the City of Fredericksburg and Stafford County through the Fredericksburg Area MPO (FAMPO), and FAMPO has undertaken a new study of a river crossing between the two localities west of I-95.

The TMP Study reviewed the river crossing, and the proposal was included in Scenario 6. Its benefits showed a reduction in congestion in conjunction with the *Western Network*. A former form of the River Crossing proposal is included in the Stafford County Comprehensive Plan further west than the FAMPO study area. For the purposes of the TMP, the blueprint locates a river crossing between the City of Fredericksburg and Stafford County in the area of the FAMPO study. However, a future River Crossing may be built at any location west of I-95 towards the Fauquier County line.

Table 17: River Crossing Blueprint

Intersection or Segment	Improvement	Cost	Status
Rappahannock River Crossing	New Bridge	N/A	Conceptual Project

3.3.2 Outer Connector and Western Bypass

Since the 1970s, in conjunction with the Rappahannock River Crossing proposals, an outer beltway commonly known as the *Outer Connector* and, more specifically, the Berea Parkway in Stafford has been discussed in the Fredericksburg region. Further, in the 1990s, VDOT studied a *Western Bypass* connecting Stafford County to the north with Prince William County and the greater Northern Virginia region. The TMP Study and its vision plan have demonstrated the need for additional travel opportunities for Stafford County to the north around Marine Corps Base Quantico and to the south over the Rappahannock River. To date, no further study has been completed since the 1990s Western Bypass Study completed by VDOT.

The Outer Connector and Western Bypass proposals both support improvements to Stafford County's geographical restrictions, both natural (Rappahannock River) and man-made (Quantico). Over 400,000 vehicles per day travel through narrow areas between Quantico and limited crossings over the Rappahannock River. Locally and regionally, the county needs more travel options to function more efficiently.



Map 12: Stafford County Geographical Restrictions

Table 18: Outer Connector and Western Bypass Blueprint

Intersection or Segment	Improvement	Cost	Status
Region-Wide Congestion Study between Fredericksburg, and Northern VA	Study	N/A	Conceptual Project

4 SUMMARY OF PROJECTS

4.1 TABLE OF PROJECTS

Phase 1 Projects		
Project Type	**Intersection or Road Segment**	**Project Description**
Roadway	Route 1 and Courthouse Rd	Turn Lanes
Roadway	Route 1 and Telegraph Rd / Woodstock	Turn Lanes / Realignment
Roadway	Berea Church Rd	Safety Improvements
Roadway	Staffordboro Blvd	Sidewalk
Roadway	Brooke Rd	Realignment
Roadway	Enon Rd and Route 1	Turn Lanes / 3-Lane Widening
Roadway	Onville Rd	Turn Lanes / 3-Lane Widening
Roadway	Shelton Shop Rd	Turn Lanes
Roadway	US-17 Business at RV Pkwy	Turn Lanes / Realignment
Roadway	Stefaniga Rd and Mountain View Rd	Roundabout
Roadway	Route 1 and Layhill Rd	Turn Lanes
Roadway	Leeland Rd	Turn Lanes / 3-Lane Widening
Roadway	US Route 1 at American Legion/Eskimo Hill	Turn Lanes
Wedge-Widening	Truslow Road (US Route 1 to Berea Church Rd)	Shoulder Widening
Wedge-Widening	Tacketts Mill Road (Heflin Rd to County Line)	Shoulder Widening
Wedge-Widening	Potomac Run Road (Potomac Run Rd)	Shoulder Widening
Wedge-Widening	Poplar Road (Tacketts Mill Rd to County Line)	Shoulder Widening
Wedge-Widening	Telegraph Road	Shoulder Widening
Wedge-Widening	Tacketts Mill Road (Poplar Rd to Heflin Rd)	Shoulder Widening
Wedge-Widening	Garrisonville Road (Joshua Rd to Lake Arrowhead Rd)	Shoulder Widening
Wedge-Widening	Garrisonville Road (Lake Arrowhead Rd to County Line)	Shoulder Widening
Wedge-Widening	Ferry Road	Shoulder Widening
Wedge-Widening	Joshua Road	Shoulder Widening
Wedge-Widening	Brooke Road (Andrew Chapel Rd to End)	Shoulder Widening
Wedge-Widening	Brooke Road (New Hope Rd to Near Stagecoach Rd)	Shoulder Widening
Wedge-Widening	Morton Road (Primmer House Rd to Leeland Rd)	Shoulder Widening
Wedge-Widening	Rock Hill Church Road (Rock Hill Church Rd)	Shoulder Widening
Wedge-Widening	Little Whim Road	Shoulder Widening
Wedge-Widening	Courthouse Road (Winding Creek Rd to Shelton Shop Rd)	Shoulder Widening
Wedge-Widening	Enon Road	Shoulder Widening
Wedge-Widening	Hope Road	Shoulder Widening

Phase 1 Projects		
Project Type	**Intersection or Road Segment**	**Project Description**
Wedge-Widening	Poplar Road (Kellogg Mill Rd to Mount Olive Rd)	Shoulder Widening
Wedge-Widening	Brooke Road (Retreat Ln to Andrew Chapel Rd)	Shoulder Widening
Wedge-Widening	Barrett Heights Road	Shoulder Widening
Wedge-Widening	Falls Run Drive	Shoulder Widening
Wedge-Widening	Heflin Road	Shoulder Widening
Wedge-Widening	Mcwhirt Loop	Shoulder Widening
Wedge-Widening	Woodstock Lane	Shoulder Widening

Phase 2 Projects - Roadway		
Project Type	**Intersection or Road Segment**	**Project Description**
Roadway	Garrisonville Road (Eustace Road to Parkway Boulevard)	Road Widening
Roadway	Garrisonville Road (Parkway Boulevard to Shelton Shop Road)	Road Widening
Roadway	Truslow Road (US Route 1 to Poplar Road)	Corridor Safety
Roadway	Poplar Road and Truslow Road	Turn Lanes
Roadway	Morton Road and Forbes Street	Turn Lanes
Roadway	US Route 1 at Foreston Woods Drive and Coal Landing Road	Turn Lanes
Roadway	US Route 1 at I-95 NB and Coachman Circle	Access Management
Roadway	US Route 1 at Potomac Hills and US Route 1 Corridor	Turn Lanes / Safety
Roadway	I-95 Exit 136 and Centreport Parkway to US Route 1	Interchange
Roadway	Warrenton Road (Stafford Lakes Parkway to Village Parkway)	Road Widening
Roadway	Butler Road at Carter Street to Castle Rock Drive	Road Widening
Roadway	Courthouse Road (Stafford Avenue and Hospital Center Blvd)	Corridor Safety
Roadway	Mountain View Road and Kellogg Mill Road	Roundabout
Roadway	US Route 1 at I-95 / Garrisonville Road	Interchange
Roadway	US Route 1 at Butler Road / Warrenton Road	Interchange

Phase 2 Projects – Bicycle and Pedestrian		
Project Type	**Intersection or Road Segment**	**Project Description**
Bike/Ped	Route 1 Area: Foreston Woods Dr	Sidewalk
Bike/Ped	Garrisonville Area: Mine Rd/Greenspring Dr	Sidewalk
Bike/Ped	Route 1 Area: Route 1 NB Landmark Ln	Shared-Use Path
Bike/Ped	Route 1 Area: Stafford Ave	Sidewalk
Bike/Ped	Route 1 Area: Coal Landing Rd at Route 1 Bridge	Shared-Use Path
Bike/Ped	Route 1 Area: Hope Rd	Sidewalk
Bike/Ped	Route 1 Area: Route 1 NB at Town Center Dr	Shared-Use Path
Bike/Ped	Garrisonville Area: Barrett Heights Rd / Whitestone Dr	Sidewalk
Bike/Ped	Route 1 Area: Route 1 SB gaps north of Foreston Woods Dr	Sidewalk
Bike/Ped	Garrisonville Area: Embrey Mill Dr /Eustace Rd	Sidewalk
Bike/Ped	Garrisonville Area: Juggins Rd	Sidewalk
Bike/Ped	Garrisonville Area: Furnace Dr	Sidewalk
Bike/Ped	Route 1 Area: Bells Hill Rd	Shared-Use Path
Bike/Ped	Route 1 Area: Bells Hill Rd at Galaway Ln to Bellflower Ln	Shared-Use Path
Bike/Ped	Garrisonville Area: Wolverine Way at Garrisonville Rd	Sidewalk
Bike/Ped	Garrisonville Area: Garrisonville Rd at Shelton Shop Rd	Sidewalk
Bike/Ped	Garrisonville Area: Travis Ln	Sidewalk
Bike/Ped	Garrisonville Area: Garrisonville Rd and Mine Rd/Staffordboro Blvd	Sidewalk
Bike/Ped	Garrisonville Area: Mine Rd and Highpointe Blvd	Sidewalk
Bike/Ped	Falmouth Area: Kings Hwy at Chatham Heights Rd	Shared-Use Path
Bike/Ped	Route 17 Area: Plantation Dr NB at Lancelot Ln	Sidewalk
Bike/Ped	Falmouth Area: Forbes St/Sapphire Ct	Sidewalk
Bike/Ped	Route 17 Area: Cardinal Dr	Sidewalk
Bike/Ped	Route 17 Area: US-17 WB Near I-95 RV Pkwy	Sidewalk
Bike/Ped	Falmouth Area: Chatham Heights Rd Gap	Sidewalk
Bike/Ped	Route 17 Area: Plantation Dr NB at US-17	Sidewalk
Bike/Ped	Falmouth Area: Route 1/Southgate Dr/Drew MS	Sidewalk
Bike/Ped	Falmouth Area: Manning Dr/Route 1	Sidewalk
Bike/Ped	Route 17 Area: US-17B EB at Quarles	Sidewalk
Bike/Ped	Falmouth Area: Butler Rd/Castle Rock Dr/BFF	Sidewalk
Bike/Ped	Route 17 Area: Berea Church Rd near Truslow Rd	Shared-Use Path
Bike/Ped	Route 17 Area: US-17 EB Near Cardinal Dr	Sidewalk
Bike/Ped	Regional: Route 1 Bridge	Shared-Use Path
Bike/Ped	Route 17 Area: Litchfield Blvd	Sidewalk
Bike/Ped	Falmouth Area: Deacon Rd	Sidewalk or Shared-Use Path

Phase 2 Projects - Trails		
Project Type	**Intersection or Road Segment**	**Project Description**
Trail	North-South County Trail (Prince William County to City of Fredericksburg)	Shared-Use Path
Trail	Belmont-Ferry Farm Trail Phase 6	Shared-Use Path
Trail	Coal Landing Rd / Route 1 to Government Island Trail	Shared-Use Path
Trail	Rappahannock River Scenic Trail	Unpaved Trail
Trail	Hospital Center Blvd to Civil War Park Trail	Shared-Use Path

Phase 3 Projects – Priority Projects		
Project Type	**Intersection or Road Segment**	**Project Description**
Roadway	Rappahannock River Crossing	New Bridge
Roadway	Commerce Pkwy	Road Widening and New Roadway
Roadway	Plantation Drive	Road Widening
Roadway	Truslow Road	Road Widening
Roadway	Enon Road	Road Widening
Roadway	Enon Road Connector	New Roadway
Roadway	Centreport Pkwy	Road Widening
Roadway	Mine Road Extension	New Roadway
Roadway	Mountain View Road	Road Widening
Roadway	Shelton Shop Road	Road Widening
Roadway	Courthouse Road	Road Widening

4.2 Table of Studies

Project Type	Intersection or Road Segment	Project Description
Study	Garrisonville Road at Shelton Shop Road to Joshua Road	Corridor Study
Study	Garrisonville Road at Joshua Road to Fauquier County Line	Corridor Study
Study	Warrenton Road at South Gateway Drive to Stafford Lakes Parkway	Corridor Study
Study	Warrenton Road at Village Parkway to Fauquier County Line	Corridor Study
Study	Route 3 at Chatham Heights Road to Kings George County Line	Corridor Study
Study	Route 218 at Deacon Road to past Ferry Road	Corridor Study
Study	Falmouth Area: Bicycle and Pedestrian GAP Study	Area Study
Study	Route 1 Area: Bicycle and Pedestrian Gap Study	Area Study
Study	Route 1: Butler Road / Warrenton Road	Environmental Study
Study	Garrisonville Rd: I-95 / Route 1	Interchange Study
Study	Region-Wide Congestion Study between Fredericksburg, and Northern VA	Regional Study

4.3 Map of Projects

