



PROJECT PIPELINE

Truslow Road, US 17 (Warrenton Road), and Stafford Plaza Drive

Fredericksburg District
Stafford County
FR-25-07

PHASE 3 REPORT
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Prepared for



Prepared by

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Table of Contents

Chapter 1: Needs Evaluation and Alternatives Development	5
1.1 Introduction	6
1.2 Methodology	6
1.3 Study Background	8
1.4 VTrans Needs	9
1.5 High-Level Needs Evaluation	11
1.5.1 Operations and Access Needs	12
1.5.2 Safety Needs	13
1.5.3 Transit and Transportation Demand Management Needs	14
1.5.4 Environmental Considerations	15
1.6 Detailed Needs Validation	21
1.6.1 Existing Conditions Traffic Operations and Safety Analysis.....	21
1.6.2 Phase 1 Public Outreach	33
1.6.3 No-Build Conditions Traffic Operations Analysis	37
1.7 Phase 1 Alternatives Development.....	45
1.7.1 Initial Alternatives.....	45
1.7.2 Phase 1 Alternative Summary	46
Chapter 2: Alternatives Refinement	48
2.1 Alternatives Refinement Overview	49
2.2 Phase 2 Alternatives Description	49
2.3 Traffic Operations and Safety Results	51
2.4 Phase 2 Public Involvement	52
2.5 Preferred Alternative Selection	55
Chapter 3: Preferred Alternative Analysis and Investment Strategy	58
3.1 Conceptual Sketch and Cost Estimates.....	59
3.2 Schedule Estimates	61
3.3 Project Risks.....	61
3.4 Possible Funding Sources	63

List of Figures

Figure 1: Project Pipeline Key Steps	6
Figure 2: Study Phase Methods and Solutions	7
Figure 3: Structure of a Technical Team	8
Figure 4: Project Study Area	10
Figure 5: High-Level Operations Needs Summary	13
Figure 6: High-Level Safety Needs Summary (2020-2024)	14
Figure 7: High-Level Transit Access Needs Diagnosis Summary	15
Figure 8: Existing Environmental Conditions Map	20
Figure 9: 2025 Existing Lane Configurations and Speed Limits (US 17)	25
Figure 10: 2025 Existing Lane Configurations and Speed Limits (Truslow Road)	26
Figure 11: 2025 Existing Peak Hour Volumes (US 17)	28
Figure 12: 2025 Existing Peak Hour Volumes (Truslow Road)	29
Figure 13: 2025 Existing Heavy Vehicle Percentages and Peak Hour Factors (US 17)	30
Figure 14: 2025 Existing Heavy Vehicle Percentages and Peak Hour Factors (Truslow Road)	31
Figure 15: Study Area Linear Growth Rate Development	38
Figure 16: 2050 No-Build Peak Hour Volumes (1)	39
Figure 17: 2050 No-Build Peak Hour Volumes (2)	40
Figure 18: Phase 1 Scoping Level Improvement Alternatives for US 17	47
Figure 19: Phase 1 Scoping Level Improvement Alternatives for Truslow Road	47
Figure 20: Phase 2 Alternative—Roundabout	50
Figure 21: Phase 2 Alternative—S-Curve Realignment	50
Figure 22: Phase 2 Alternative—Shared-Use Path	51
Figure 23: Public Engagement—Average Rating of Alternatives	53
Figure 24: Public Engagement—Roundabout Concept Ranking	53
Figure 25: Public Engagement—Average Rating of Alternatives	54
Figure 26: Public Engagement—S-Curve Concept Ranking	54
Figure 27: Public Engagement—Shared-Use Path Concept Ranking	55
Figure 28: Preferred Alternative—Roundabout and S-Curve Reconstruction	57
Figure 29: Preferred Alternative Conceptual Sketch	60

List of Tables

Table 1: Study Intersections	9
Table 2: VTrans Needs Identified in the Study Area	11
Table 3: Existing Environmental Conditions Summary	17
Table 4: Study Area Crashes by Crash Severity.....	22
Table 5: Study Area Crashes by Crash Type	23
Table 6: Collected Truslow Road Speeds.....	27
Table 7: Level of Service Criteria	27
Table 8: Synchro Report for Control Delay	32
Table 9: 2025 Existing Conditions Peak Hour Control Delay and LOS (1)	34
Table 10: 2025 Existing Conditions Peak Hour Control Delay and LOS (2)	35
Table 11: 2025 Existing Conditions Peak Hour 95 th Percentile Queues	36
Table 12: 2050 No-Build Conditions Peak Hour Control Delay and LOS.....	43
Table 13: 2050 No-Build Conditions Peak Hour 95 th Percentile Queues	44
Table 14: Phase 1 Alternatives.....	45
Table 15: Phase 1 Alternatives to Move Forward to Phase 2	46
Table 16: SIDRA Roundabout Traffic Operations Results	52
Table 17: CMF and Crash Reduction Summary	52
Table 18: Preferred Alternative Selection for FR-25-07	56
Table 19: FY2026 Preferred Alternative Cost Estimate	59
Table 20: Schedule Estimate	61

List of Appendices

Appendix A—Framework Document and Kickoff Meeting
Appendix B—Needs and Existing Conditions Summary
Appendix C—Existing Conditions Analysis
Appendix D—Volume Balancing and Traffic Forecasting
Appendix E—Concept Development
Appendix F—Preferred Alternative

Chapter 1: Needs Evaluation and Alternatives Development

1.1 Introduction

Project Pipeline is a performance-based planning program to identify cost-effective solutions to multimodal transportation needs in Virginia. Through this planning process, projects and solutions may be considered for funding through programs, including SMART SCALE, revenue sharing, interstate funding, and others. SMART SCALE is Virginia's data-driven prioritization process that scores and evaluates potential transportation projects based on key factors including congestion reduction, safety improvement, accessibility, land use, economic development, and environmental quality to determine which projects may receive state funding. Visit the Project Pipeline webpage for additional information:

<https://vapipeline.virginia.gov/>.

This study, entitled FR-25-07—Truslow Road, US 17 (Warrenton Road), and Stafford Plaza Drive, focuses on concepts targeting identified needs including capacity preservation, Transportation Demand Management (TDM), bicycle access, pedestrian access, safety, and transit access. The four key steps within the Project Pipeline performance-based planning and programming process are shown in **Figure 1**.



Figure 1: Project Pipeline Key Steps

1.2 Methodology

The Project Pipeline study process consists of three phases:

- **Phase 1:** Problem Diagnosis and Alternative Brainstorming
- **Phase 2:** Alternative Evaluation and Sketch-Level Analysis
- **Phase 3:** Investment Strategy and Cost Estimate

Figure 2 shows the overall Project Pipeline process, key milestones, and schedule in relation to critical SMART SCALE dates.

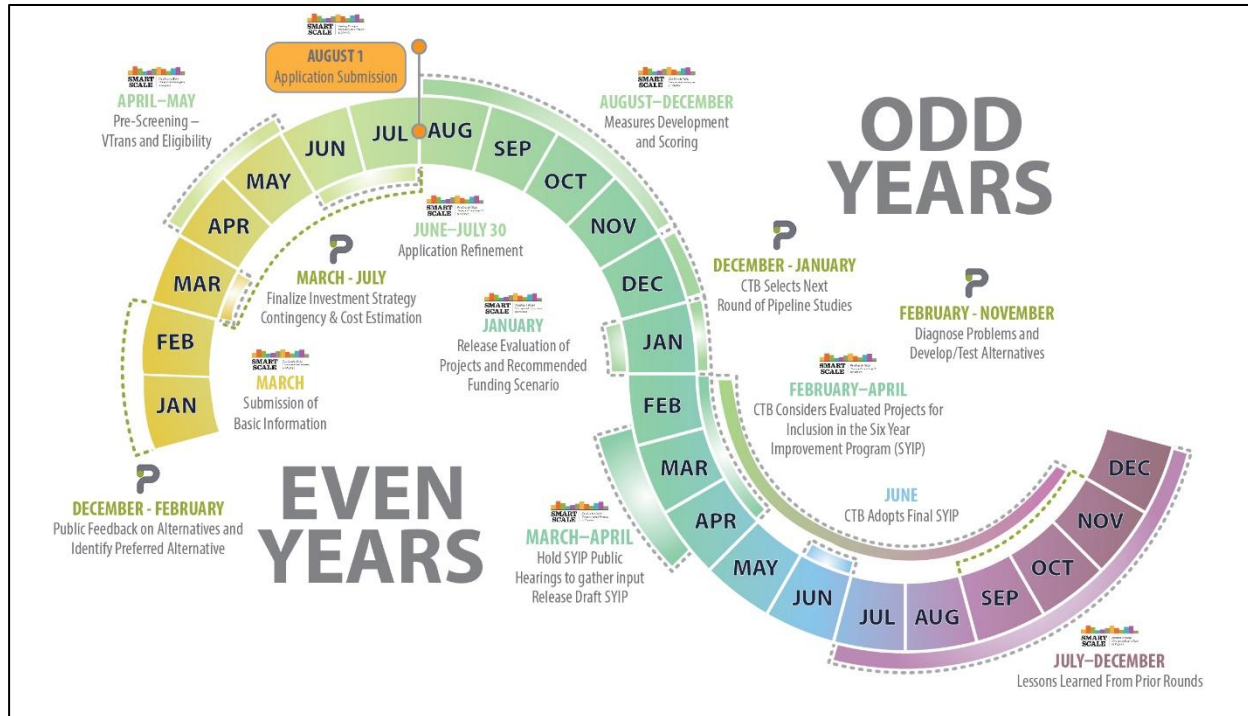


Figure 2: Study Phase Methods and Solutions

The study team is broken down into technical teams to review data, develop preliminary alternatives, refine solutions, and provide clear messages to stakeholders regarding the most viable and effective solutions related to the priorities and needs for each study. The priorities, needs, and scope of each study guides the level of Technical Team involvement. In general, the technical teams include the Office of Intermodal Planning and Investment (OIPI), the Virginia Department of Transportation (VDOT), and consultant staff from the following departments and/or disciplines:

- District Planning
- District Traffic Operations
- District Location and Design (L&D)
- District subject matter experts (e.g., Right of Way, Utilities, and Environmental, as needed)
- Central Office Divisions, as needed
- Consultant Teams
- DRPT, as needed
- Localities, if applicable
- Metropolitan Planning Organizations (MPOs) or Planning District Commissions (PDCs), if applicable

A sample organizational chart of a technical team is shown in **Figure 3**.

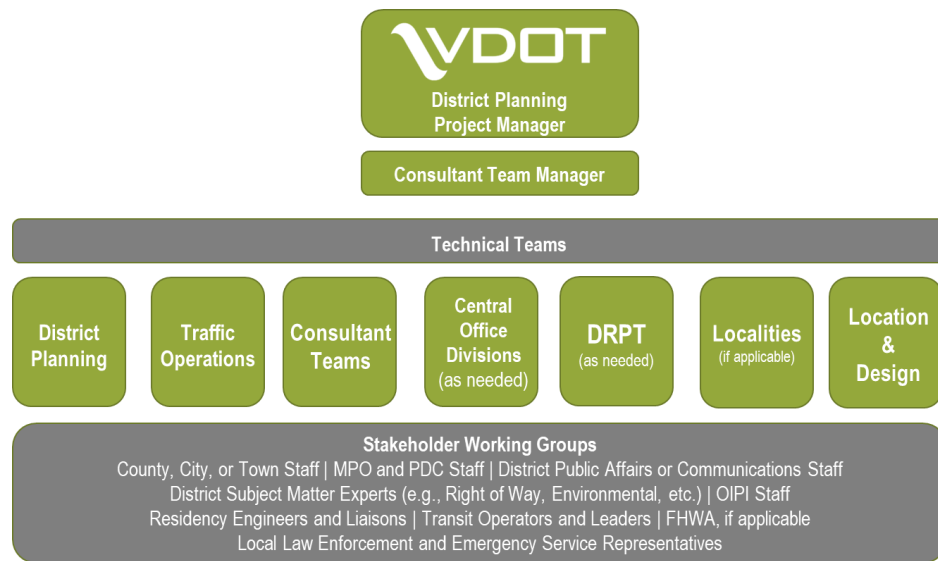


Figure 3: Structure of a Technical Team

1.3 Study Background

A Study Work Group (SWG) was formed for this study to capture input from local stakeholders and shape the development of potential improvements. The SWG provided local and institutional knowledge of the corridor, reviewed study methodologies, provided input on key assumptions, and reviewed and approved proposed improvements developed through the study process. The SWG included members representing the following organizations:

- Office of Intermodal Planning and Investment (OIPI)
- Virginia Department of Transportation (VDOT)
- Virginia Department of Rail and Public Transportation (DRPT)
- Fredericksburg Area Metropolitan Planning Organization (FAMPO)
- Stafford County
- Stafford County Public Schools
- Fredericksburg Regional Transit (FXBGO!)
- Kimley-Horn

The study area for this analysis includes a portion of US 17, Truslow Road, and the programmed extension of Stafford Plaza Drive located in Stafford County, VA, as shown in **Figure 4**. For consistency throughout this report, US 17 and Truslow Road are described using northbound/southbound designations.

The study limits for US 17 extend from Village Parkway/Stafford Plaza Drive to the north to Cardinal Forest Drive to the south. Within the study area, US 17 is a four-lane divided roadway classified as an Other Principal Arterial with a posted speed limit of 45 mph. US 17 is also a part of VDOT's Arterial Preservation Network (APN).

The study limits for Truslow Road extend from Cool Breeze Way to the north to Berea Church Road to the south. Truslow Road is a parallel route to US 17, and is a two-lane undivided roadway classified as a Major Collector with a posted speed limit of 35 mph.

Included in the study area is a programmed extension of Stafford Plaza Drive that is currently under construction. This new road will extend from Truslow Road to the east to US 17 to the west. The Stafford Plaza Drive extension is scheduled for completion in August 2026 (subject to construction progress) and will be a two-lane undivided road classified as a minor collector with a posted speed limit of 35 mph.

The roadway network provides commuters and regional travelers access to I-95 and US 1 and serves as an important corridor for freight movement along US 17. Commercial and residential developments border the study area. A new high school and elementary school that will be accessed from Stafford Plaza Drive are being constructed, and the extension is expected to also provide access to several approved multiuse developments.

The study area includes eight at-grade intersections, consisting of two signalized intersections and six unsignalized intersections. The eight study intersections are shown in **Table 1** and **Figure 4**.

Table 1: Study Intersections

#	Intersection Name	Control Type
1	US 17 (Warrenton Road) at Cardinal Forest Drive	Signalized
2	US 17 (Warrenton Road) at Village Parkway/Stafford Plaza Drive	Signalized
3	Truslow Road at Cool Breeze Way	Unsignalized
4	Truslow Road at Stafford Plaza Drive/Summer Breeze Lane	Unsignalized
5	Truslow Road at Norfolk Street	Unsignalized
6	Truslow Road at Liberty Hall Drive	Unsignalized
7	Truslow Road at Truslow Ridge Court	Unsignalized
8	Truslow Road at Berea Church Road	Unsignalized

The study team collected traffic counts, signal timing data, and pedestrian and bicycle counts to assist with the transportation analysis in the study area.

A framework document was developed in coordination with the SWG which outlined the study's needs, methods, and assumptions. The signed framework document is provided in **Appendix A**. A kickoff meeting with the SWG was held on April 4, 2025, to provide an overview of the study and obtain feedback on the study's assumptions. The kickoff meeting materials are in **Appendix A**.

1.4 VTrans Needs

Project Pipeline follows a performance-based planning approach to identify solutions that address VTrans mid-term needs. VTrans is Virginia's statewide transportation plan that is prepared by OIPI for the Commonwealth Transportation Board (CTB). VTrans mid-term needs (0-10 years) were identified from a data-informed process and were used as a primary source in the selection of Project Pipeline study corridors. **Table 2** outlines the VTrans needs in the study area.

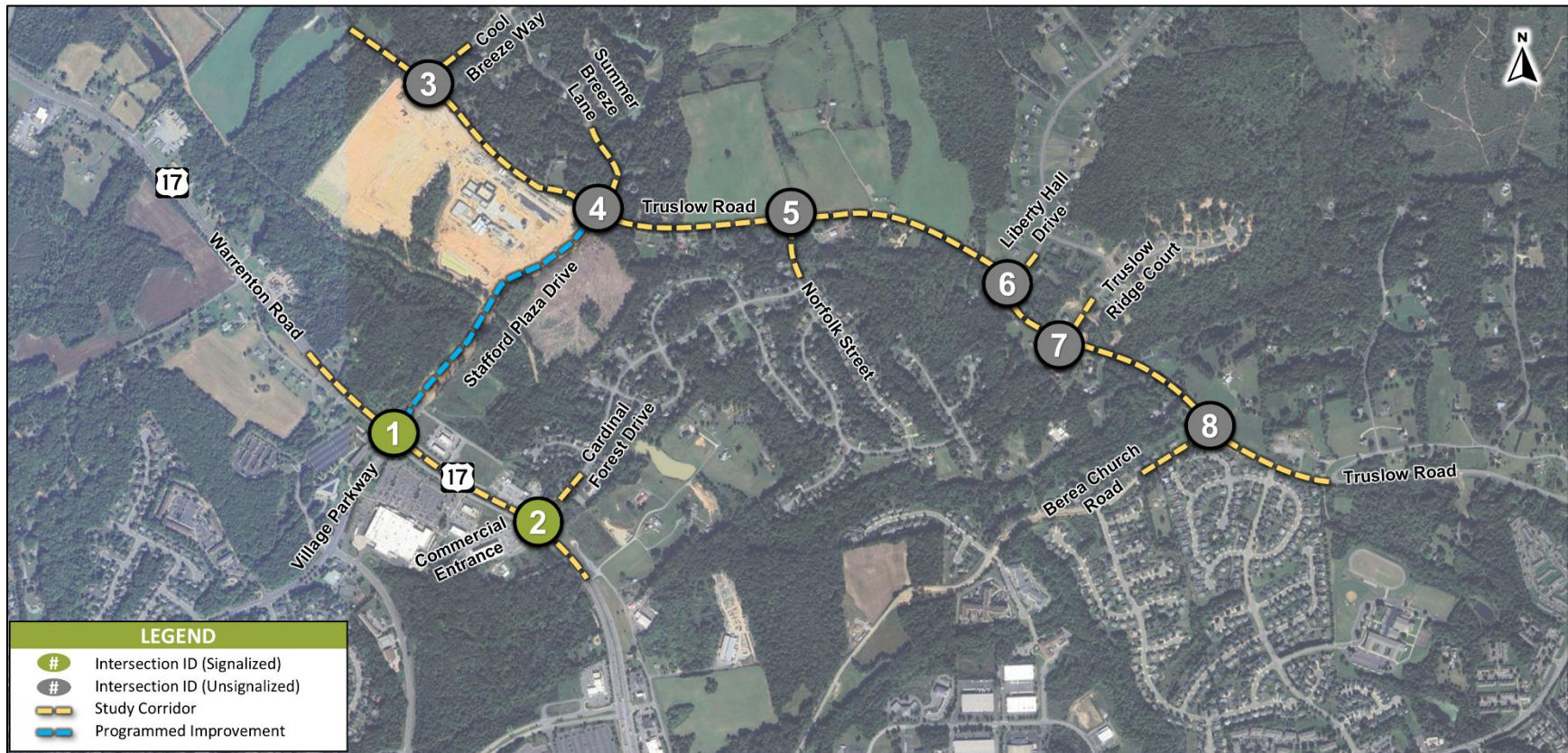


Figure 4: Project Study Area

Table 2: VTrans Needs Identified in the Study Area

VTrans 2025 Mid-Term Need	Priority—Truslow Rd
 Safety Improvement	Low
 Transportation Demand Management (TDM)	Low
 Bicycle Access	Low
 Transit Access	Medium
VTrans 2025 Mid-Term Need	Priority—US 17
 Capacity Preservation	Very High
 Safety Improvement	Low
 Pedestrian Safety Improvement	Low
 Transportation Demand Management (TDM)	Very High
 Pedestrian Access	High
 Bicycle Access	Very High
 Transit Access	Very High
 Transit Access for Equity Emphasis Areas	Medium

The Truslow Road, US 17, and Stafford Plaza Drive study area was selected as a Project Pipeline study location due to the presence of multiple VTrans needs. The project team took the following steps to confirm and evaluate the VTrans needs identified in the study area:

- Reviewed the Project Pipeline data dashboards to identify issues and transportation trends in the study area
- Conducted a field review of the study area to observe issues and document existing conditions
- Collected traffic counts at the study area intersections
- Reviewed relevant studies and plans near the study area to inform the alternatives development
- Conducted detailed existing conditions operational analyses using Synchro
- Assessed existing transit service, multimodal infrastructure, and the suitability for additional transit service within the study area

1.5 High-Level Needs Evaluation

Data dashboards were developed by OIPI and VDOT to centralize data collection and leverage big data sources to streamline VTrans needs and problem diagnosis across all Project Pipeline studies, as well as to expand on the core issues and patterns identified in the study's framework document.

The data dashboards contained performance measures including VDOT crash data, travel time index data, level of travel time reliability (LOTTR) data, and speed data for each study area. The results of this analysis are summarized in the Needs and Existing Conditions Summary, which can be found in **Appendix B**.

The study team reviewed the dashboard performance measures in addition to other sources to validate the presence of VTrans needs and identify the most effective improvements in the study area.

1.5.1 Operations and Access Needs

The study area was noted to have a Capacity Preservation VTrans need, which indicates that the corridor needs to preserve and enhance its existing capacity by improving access management, reducing signals or signal phases, and implementing innovative intersection configurations, where possible. This aligns with the observed existing Travel Time Index (TTI) as shown in **Figure 5**. TTI is the ratio of the travel time during the peak period to the time required to make the same trip at free-flow speeds. Values above 1.0 indicate that travelers experience delays compared to free-flow conditions. For US 17, the highest experienced TTI tends to occur during the PM peak, with a TTI of approximately 1.3 to 1.4. For Truslow Road, the highest experienced TTI was noted to be slightly above 1.0, with minimal impacts to travel times.

Dashboard speed data within the study area, as shown in **Figure 5**, also indicates reliable travel, with average speeds on Truslow Road staying at or above the speed limit throughout the day. Within the study area, the segment of US 17 is shown to be generally operating under the posted speed limit.

However, since the segment of US 17 being analyzed in this dashboard represents a half-mile stretch and contains two traffic signals, the lower operational speeds are expected as vehicles will be stopping more frequently. This condition contributes to both the observed TTI and the travel speeds presented in this analysis. As such, this section of US 17 could benefit from improvements that address the capacity preservation needs that were identified.

The Truslow Road section of the study area has a low Bicycle Access VTrans need. The US 17 section has very high need for Bicycle Access and a high need for Pedestrian Access. There is existing sidewalk on the west side of US 17 between Village Parkway/Stafford Plaza Drive and Cardinal Forest Drive, but no dedicated bicycle facilities currently exist along the corridor. No existing bicycle or pedestrian facilities are present along Truslow Road within the study area limits. However, the proposed Stafford Plaza Drive extension includes sidewalk and crosswalks along both sides of the new roadway between US 17 and Truslow Road.

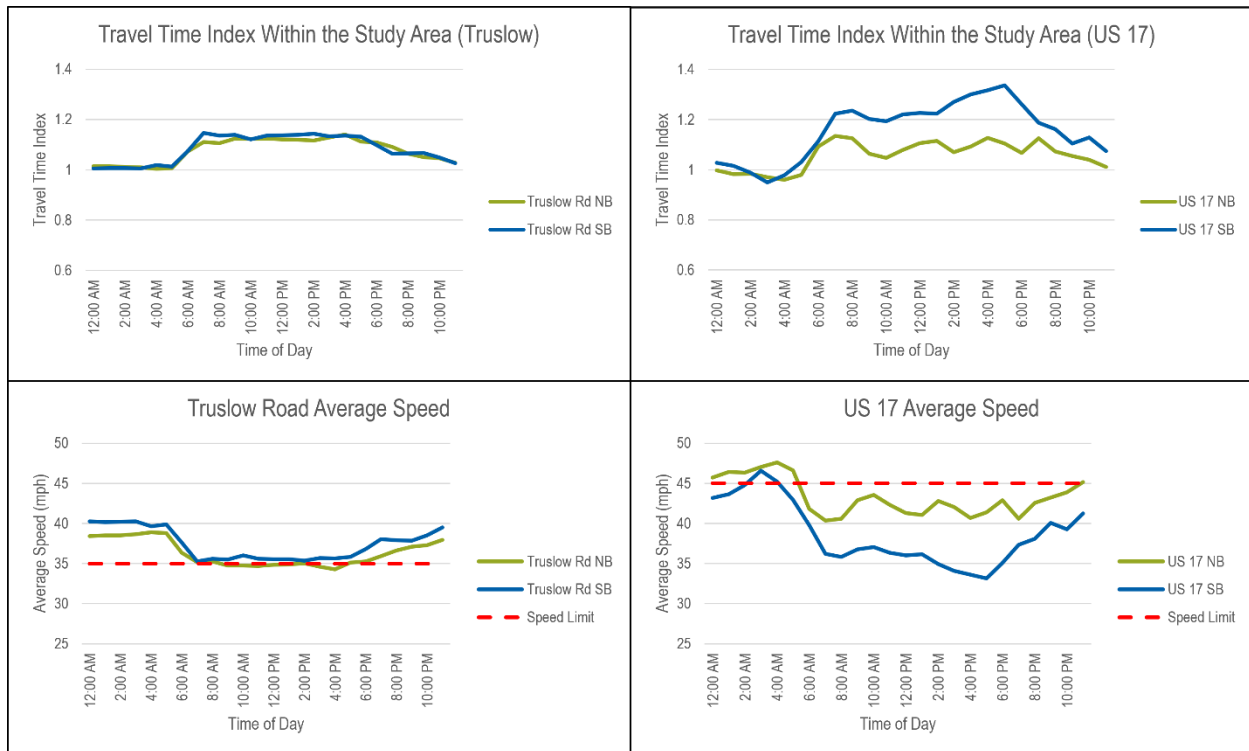


Figure 5: High-Level Operations Needs Summary

1.5.2 Safety Needs

The Truslow Road section of the study area has a low Construction District Safety Improvement VTrans need, while the US 17 section has low VTrans needs for Construction District Safety Improvement, Statewide Safety Improvement, and Pedestrian Safety Improvement. The study team reviewed the VDOT crash data from 2020-2024 to identify high-level crash trends within the study area.

In total, 71 crashes were reported within the study area, including 26 injury crashes and 45 crashes involving property damage only (PDO), with no fatalities. Most crashes at intersections along US 17 were either rear end (43%) or angle (33%) crashes. Along the Truslow Road corridor, the most common crash type was fixed object – off road (57% of crashes). **Figure 6** shows additional details regarding crashes in the study area.

Although the corridor's VTrans Safety Need ranking is low relative to statewide thresholds, localized crash patterns at key intersections indicate opportunities for operational and geometric improvements.

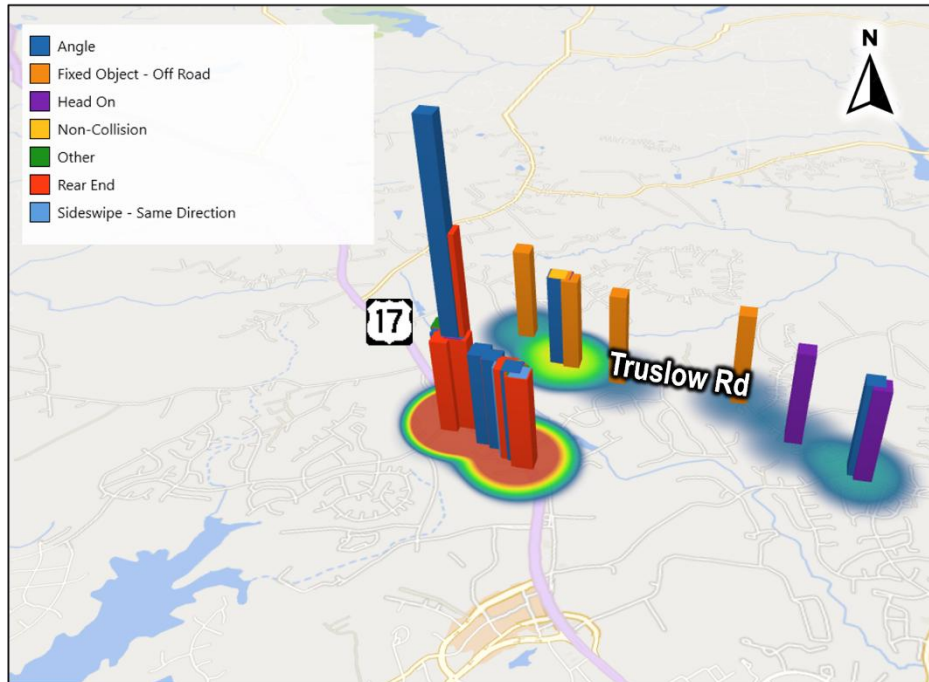


Figure 6: High-Level Safety Needs Summary (2020-2024)

1.5.3 Transit and Transportation Demand Management Needs

The Truslow Road section of the study area has a low TDM VTrans need and a medium Transit Access need. The US 17 section has very high needs for TDM and Transit Access, with a medium need for Transit Access for Equity Emphasis Areas. The study team reviewed existing Fredericksburg Regional Transit (FXBGO!) bus services in the study area. A recently implemented expansion to FXBGO! Route D2 provides service farther north along US 17 to Village Parkway, as shown in **Figure 7**. Current transit services are not provided along Truslow Road within the study area.

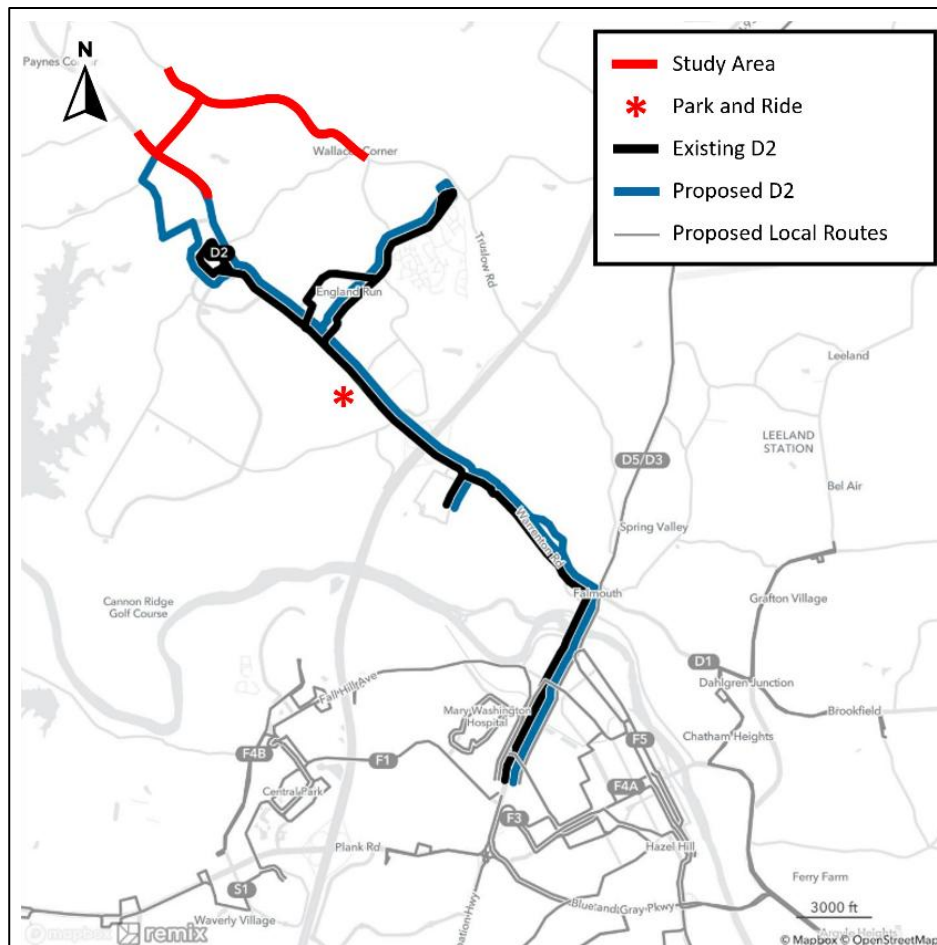


Figure 7: High-Level Transit Access Needs Diagnosis Summary

1.5.4 Environmental Considerations

A high-level review of existing environmental conditions was completed to better understand the existing environment, potential impacts of the project to resources within the study area, and future actions that may need to be taken to comply with state and federal environmental review regulations. The environmental resources discussed in this report are within the proposed project's study area.

A desktop review using readily available Geographic Information System (GIS) data, online environmental resource maps, census data, and other relevant information was referenced to identify existing socioeconomic and environmental conditions within the project study area. The methods utilized to complete this review were drawn from national, statewide, and local sources. Data was gathered to identify resources pertaining to the natural and human environment consistent with the resource categories included in the VDOT Categorical Exclusion checklist (EQ-104). The Virginia Department of Environmental Quality (DEQ) [EJScreen+ tool](#) is an enhanced environmental justice screening and mapping tool and was used to gather information on environmental and demographic indicators.

A summary of the environmental resources that were considered and the source for the data used to evaluate the existing conditions and potential impacts are summarized in **Table 3**. For this study, community services were defined as publicly accessible facilities used to provide services to the public or

as gathering spaces for organizations. These may include public education, welfare, emergency services, postal office, libraries, social work, food banks, health care, police, fire services, public transportation, and public housing.

The limits of the environmental resources review were developed by implementing a buffer from the identified roadways and interchanges that were being evaluated for improvements, as well as initial improvement concepts being developed. The width of the buffer varied based on the anticipated improvements or level of impacts in that area from 100 to 500 feet. Therefore, the limits of the environmental resources review conservatively captured an inventory of known environmental resources. As part of this review, it was assumed that the entire study area may experience some level of disturbance. However, avoidance and minimization measures would be applied throughout project development, resulting in reduced impacts as the project progresses. The resources identified in the study areas are also shown in **Figure 8**.

Table 3: Existing Environmental Conditions Summary

Environmental Resource	Description	Source	Existing Resources in Study Area
Environmental Justice	Identifying minority and low-income populations adjacent to the project corridor, as defined by the VDOT Environmental Division Instructional and Informational Memorandum and determining if a disproportionately high and adverse effect is anticipated.	Virginia DEQ EJScreen+	Within the study area, one census block group was identified with communities of color (53.08% of population), and no census block groups with a low-income community.
Limited English Proficiency	Populations who speak English less than very well within and adjacent to the project corridor.	US Census Bureau People That Speak English Less Than "Very Well" in the United States	Within the study area, three census block groups were identified as having 2.1% to 6.6% of residents are considered Limited English Proficient (LEP).
Recreational Facilities	Places available for recreational or communal use, such as a YMCA or community parks.	Virginia Department of Conservation Recreation (VDCR) Natural Heritage Data Explorer (NHDE) VDCR Virginia Outdoor Plan Mapper Aerial Imagery Google Maps	A managed trail is located along Truslow Road toward the eastern extent of the study area.
Community Services	Places available to the public such as hospitals, schools, and churches.	Aerial Imagery Virginia Geographic Information Network (VGIN) Stafford County GIS Data Google Maps	Several educational institutions and places of worship are located near the study area, including the University of Mary Washington – Stafford Campus. Lifecare Medical Transports is located off International Parkway to the south of the project.
Bike/Pedestrian Facilities	Existing sidewalks, bike paths, and trails.	Stafford County GIS Data Aerial Imagery Google Maps VDCR Virginia Outdoor Plan Mapper	Limited pedestrian facilities currently exist within the study area, including sidewalk along portions of US 17. Dedicated bicycle facilities are not currently present
Section 6(f)	Sites funded through the Land and Water Conservation Fund (LWCF) and owned by state or local entities.	VDCR Virginia Outdoor Plan Mapper VDCR Conservation Lands Virginia Outdoor Foundation	There are no conservation lands or easements near or within the study area.
Section 106* Resources	Known historic architectural or archaeological sites within or immediately adjacent to the project corridor including sites that are listed or eligible for listing on the National Register of Historic Places (NRHP) and sites that have not been evaluated are potentially eligible, or any other status as noted on the VDHR V-CRIS website.	Virginia Department of Historic Resources (VDHR) Virginia Cultural Resource Information System (V-CRIS) National Register of Historic Places (NRHP)	The area along US 17 was listed or determined eligible. This area is identified as the area for the Chancellorsville Battlefield.

Environmental Resource	Description	Source	Existing Resources in Study Area
Section 4(f)*	Publicly owned parks or recreation lands, wildlife and waterfowl refuges, and privately and publicly owned historic sites protected by Section 4(f) of the U.S. Department of Transportation Act of 1966.	VDCR NHDE VDCR Virginia Outdoor Plan Mapper VDHR V-CRIS Stafford County GIS Data	No publicly owned parks or recreation lands, wildlife and waterfowl refuges, or privately and publicly owned historic sites are located within the study area or the surrounding vicinity.
Protected Species	Threatened and endangered species, as defined by the state and federal government databases, existing within or near the project corridor.	United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPAC) Virginia Department of Wildlife Resource (VDWR) Virginia Fish and Wildlife Information Services (VaFWIS) VDWR Wildlife Environmental Review Map Service (WERMS) VDWR Wildlife Environmental Review Map Service (WERMS) VDWR Bat Consultation Tool (Northern Long-Eared Bat [NLEB], Tri-Colored Bat, and Little Brown Bat) VDWR Little Brown (MYLU) and Tri-Colored (PESU) Habitat Application Center for Conservation Biology (CCB) Eagle Nest Locator	CCB - No nests were identified within the study area
Floodplains	Areas considered at risk for flooding during 100-year and 500-year storms.	Federal Emergency Management Agency (FEMA) Flood Hazard Areas	Portions of the study area and surrounding areas are located in Floodway or 500-Year Floodplain areas.
Surface Water & Wetlands	Review of NHD and NWI to determine the likelihood of streams and wetlands present within and immediately adjacent to the project corridor.	United States Geological Survey (USGS) National Hydrography Dataset (NHD) USFWS National Wetland Inventory (NWI)	Multiple wetlands are scattered within and around the study area. - Multiple wetlands are scattered within and around the study area. - One pond is located to the south of the study area between Cardinal Forest Drive and Lerose Drive.
Hazardous Materials	Any documented spills, releases, or history of contamination on surrounding sites that may be impacted by the proposed project.	Virginia Department of Environmental Quality (DEQ) Environmental Data Mapper	Multiple registered petroleum tank facilities and closed petroleum release cases are located within and directly outside the study area.

Environmental Resource	Description	Source	Existing Resources in Study Area
Open Space, Conservations Easements, Agricultural, and Forestal Districts	Lands protected by a voluntary agreement with a non-profit land trust or government agency that allows a landowner to limit the type or amount of development on the property. Agricultural and forestal districts are those defined as such in the zoning map.	VDCR NHDE VDCR Outdoors Plan Mapper Stafford County GIS Data The Nature Conservancy The Virginia Outdoor Foundation The Nature Conservancy	- Forested areas are scattered within and around the study area in all directions. - No conservation easements or agricultural districts were located within the study area or in the surrounding vicinity.
Farmland	Lands with soils that are considered prime farmland and outside a census-designated urban area.	United States Census Bureau Urban Area Maps Natural Resources Conservation Service Web Soil Survey	A small portion of prime farmland is located throughout the study area. The remainder of the study area is not prime farmland. The area south of US 17 and east of Cardinal Forest Drive is a census-designated urban area, and the rest of the study area is a census-designated non-urban area subject to the Farmland Protection Policy Act.
Noise	Determining whether the subject project may be considered a Type I project based on VDOT and FHWA guidance.	VDOT and FHWA Noise Guidance	Based on VDOT and FHWA guidance, it is not anticipated the project will be considered a Type I noise project.
Land Use	Land Area that has been given a specific use based on local jurisdiction land use designations.	Stafford County GIS Data	The study area is primarily classified as residential with commercial areas at the northern terminus of the project.
Air Quality	Determine whether the subject project is in an air quality attainment area and whether a qualitative analysis may be required.	Environmental Protection Agency Green Book	No air quality impacts are anticipated; therefore, a qualitative analysis is not anticipated to be required.

**Assessment based on the currently listed, determined eligible, or recommended eligible for the NRHP properties pending potential further investigations for recommendations not yet confirmed by VDHR or for individual sites not yet evaluated.*

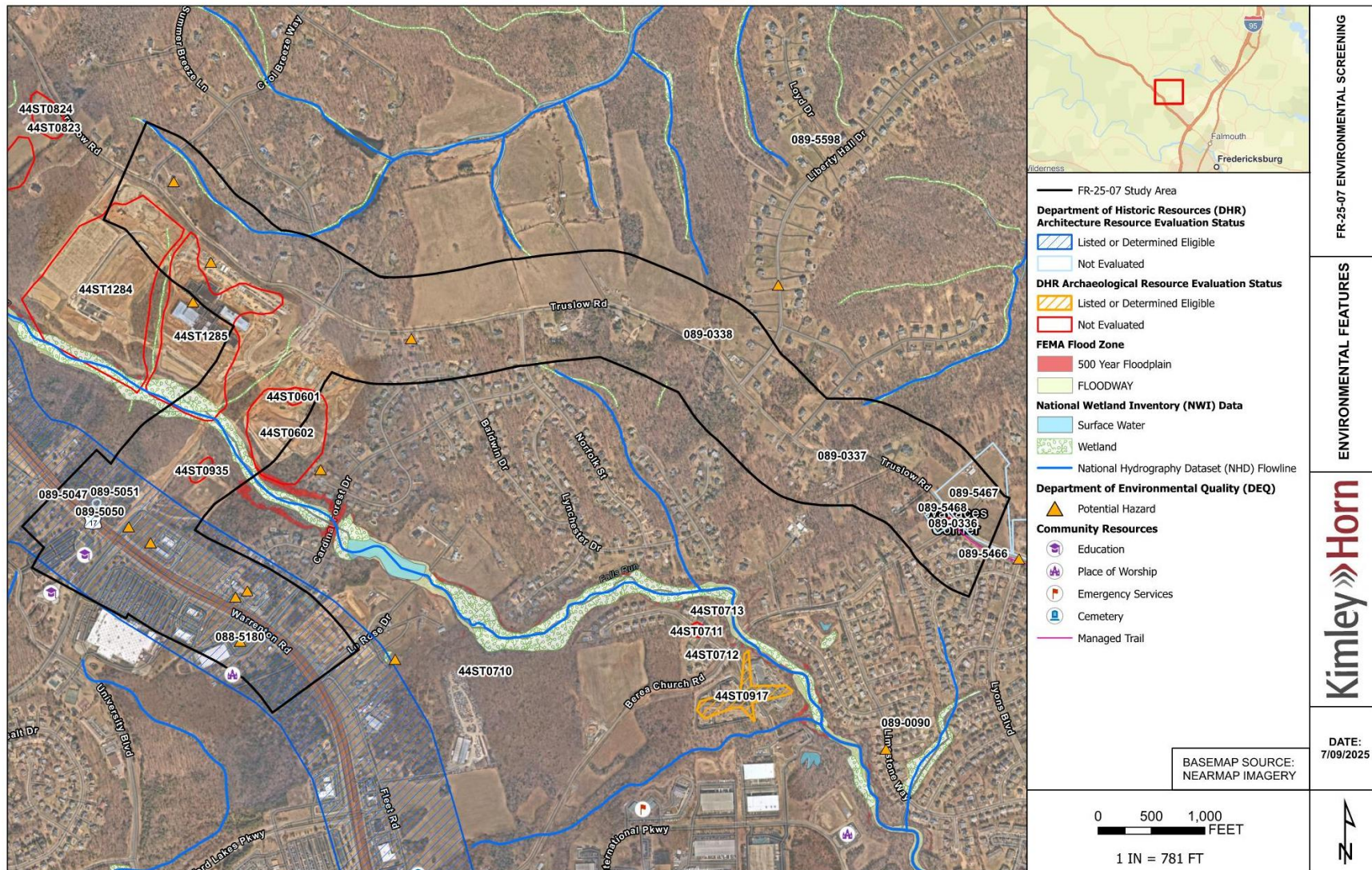


Figure 8: Existing Environmental Conditions Map

1.6 Detailed Needs Validation

The study team performed additional traffic operations and safety analysis to further quantify the existing and anticipated needs within the study area. Results from these analyses were used as a baseline when comparing the conditions of the proposed improvements to the existing and anticipated No-Build conditions.

1.6.1 Existing Conditions Traffic Operations and Safety Analysis

The study team conducted a multifaceted analysis of the existing conditions of the study corridor, which included reviewing previous studies, conducting a safety analysis, conducting a preliminary field review, analyzing traffic operations using Synchro, and reviewing pedestrian, bicycle, and transit activity. Preliminary Synchro results of the existing conditions analysis and preliminary brainstorming concepts were presented to the SWG during the Needs Evaluation, Diagnosis, and Preliminary Concepts Meeting (SWG Meeting #2) on June 12, 2025. The presentation is provided for reference in **Appendix C**.

Relevant Studies, Plans, and Projects

Information for the following studies, plans, and projects was collected and reviewed to identify previous or ongoing recommendations in and adjacent to the study area:

- Stafford County High School #6 – TIA (April 2023)
 - Proposed a second southbound left-turn lane from US 17 onto Stafford Plaza Drive
 - Proposed a southbound right-turn lane and a northbound left-turn lane on Truslow Road onto the Stafford Plaza Drive extension
- Stafford Elementary School #18 – TIA (Drafted December 2022)
- Warrenton Road Widening Operations and Safety Evaluation (July 2024)
 - Analyzed US 17 from Village Parkway to Stafford Lakes Parkway
 - Proposed widening US 17 from four to six lanes within project limits
 - SMART SCALE Round 6 Application 11641 submitted by Stafford County references proposed improvements from this study
 - The application was not selected for funding, but Stafford County stated they would be submitting a similar widening project in SMART SCALE Round 7 with an updated Warrenton Road Widening study to support that effort

Safety Analysis

A safety analysis was conducted using crash data from the VDOT Crash Database over a five-year period (January 1, 2020 – December 31, 2024). In total, 71 crashes were reported in the study area. Summaries of crashes in the study area by severity and type are shown in **Table 4** and **Table 5**, respectively.

Appendix C includes a detailed crash summary for the study area. Crash severity is coded using the KABCO scale, which is defined using the following classifications:

- K—Fatality
- A—Suspected Serious Injury
- B—Suspected Minor Injury
- C—Possible Injury
- PDO—Property Damage Only

The study team identified the two intersections on US 17 as crash hot spots within the study area, with 32 crashes occurring at the Village Parkway/Stafford Plaza Drive intersection and 17 crashes occurring at the Cardinal Forest Drive intersection. Rear end and angle crashes were the most prevalent crash types at both intersections, making up a total of 85% of all crashes at Village Parkway/Stafford Plaza Drive and 59% of all crashes at Cardinal Forest Drive.

The crash data on Truslow Road indicated a lower frequency of crashes relative to US 17 despite a perceived safety risk along the corridor. The highest concentration of crashes on Truslow Road was at the “S-curve” to the north of Summer Breeze Lane; between 2020 and 2024, six crashes occurred at this location. Three of these were classified as fixed object – off road crashes, and a fourth was an angle crash that also involved a roadway departure.

Table 4: Study Area Crashes by Crash Severity

Intersection	# of Crashes—K	# of Crashes—A	# of Crashes—B	# of Crashes—C	# of Crashes—PDO	Total
US 17 at Village Parkway/Stafford Plaza Drive	0	1	6	1	24	32
US 17 at Cardinal Forest Drive	0	1	6	0	10	17
Truslow Road at Cool Breeze Way	0	1	0	0	1	2
Truslow Road at Stafford Plaza Drive/Summer Breeze Lane	0	0	0	0	1	1
Truslow Road at Norfolk Street	0	0	0	0	0	0
Truslow Road at Liberty Hall Drive	0	0	0	0	0	0
Truslow Road at Truslow Ridge Court	0	0	0	0	0	0
Truslow Road at Berea Church Road	0	0	1	0	0	1
Rest of study area (i.e., US 17 and Truslow Road)	0	0	9	0	9	18
Total	0 (0%)	3 (4%)	22 (31%)	1 (1%)	45 (64%)	71

Table 5: Study Area Crashes by Crash Type

Intersection	# of Crashes – Angle	# of Crashes – Rear End	# of Crashes – Head-On	# of Crashes – Fixed Object	# of Crashes – Side-swipe	# of Crashes – Pedestrian	# of Crashes – Other	# of Crashes – Total
US 17 at Village Parkway/Stafford Plaza Drive	13	14	1	1	1	0	2	32
US 17 at Cardinal Forest Drive	3	7	2	1	2	0	2	17
Truslow Road at Cool Breeze Way	0	0	0	2	0	0	0	2
Truslow Road at Stafford Plaza Drive/Summer Breeze Lane	0	0	0	1	0	0	0	1
Truslow Road at Norfolk Street	0	0	0	0	0	0	0	0
Truslow Road at Liberty Hall Drive	0	0	0	0	0	0	0	0
Truslow Road at Truslow Ridge Court	0	0	0	0	0	0	0	0
Truslow Road at Berea Church Road	1	0	0	0	0	0	0	1
Rest of study area (i.e., US 17 and Truslow Road)	4	4	3	6	0	0	1	18
Total	21 (30%)	25 (35%)	6 (8%)	11 (15%)	3 (4%)	0 (0%)	5 (7%)	71

All intersection and roadway segments within the VDOT linear referencing system (LRS) are evaluated annually for the potential for safety improvement (PSI) based on the Highway Safety Manual (HSM) methodology by VDOT. The crash frequency, severity of crashes, volume, and length of segment are contributing factors in the predicative analysis. Crash predictions, based on the safety performance function (SPF) crash data files, are made for intersection and segments. The top 100 intersections and 100 miles of segments are published by VDOT for each district on an annual basis. Truslow Road between Cool Breeze Way and Summer Breeze Lane was identified as a 2020 PSI segment with a ranking of 62 within the Fredericksburg District.

Field Review Observations

A preliminary field review of the study area was conducted on Thursday, April 17, 2025, to verify existing conditions, confirm traffic control devices and lane configurations, and observe peak hour traffic conditions and driver behavior. The existing lane configurations and speeds limits in the study area are summarized in **Figure 9** and **Figure 10**.

The following observations were made within the study area during the field review:

US 17 at Village Parkway/Stafford Plaza Drive

- Southbound queues extended back to Peach Lawn Road (AM and PM peak periods)
- The northbound left-turn was consistently heavy, and vehicles tended to favor the inside lane (PM peak period)
- The second eastbound right-turn lane was not consistently being used (PM peak period)
- There were occasional conflicts between northbound U-turns and the eastbound right-turn overlap (PM peak period)

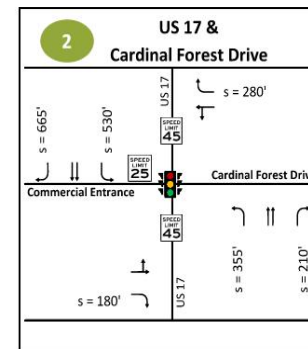
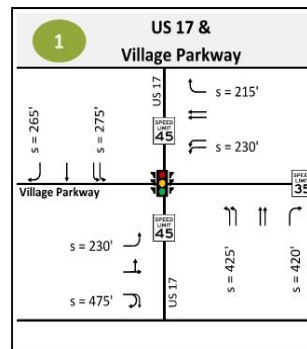
Additional observations in the study area include:

- Pedestrian activity along both corridors was minimal (AM and PM peak periods)
- Observed heavy vehicle volumes along Truslow Road may be higher than normal due to school construction traffic
- Berea Church Road was closed to through traffic half a mile west of the intersection

Existing Conditions Synchro Analysis

The study team conducted a traffic operations analysis to evaluate the overall performance of the study corridor under existing (2025) AM and PM peak hour conditions. Existing conditions were modeled using Synchro 11. The existing AM and PM Synchro models were developed based on the existing roadway geometry and collected traffic count data. Inputs and analysis methodologies were consistent with the *VDOT Traffic Operations and Safety Analysis Manual (TOSAM)*, Version 2.0. Whereas the six unsignalized intersections within the study area were analyzed using HCM 6th edition reporting methodology, the two signalized intersections were analyzed using HCM 2000 edition methodology to accommodate their non-standard NEMA phasing.

2025 Existing Lane Configurations and Speed Limits



FR-25-07 | Truslow Road, US 17, and Stafford Plaza Drive

Figure 9: 2025 Existing Lane Configurations and Speed Limits (US 17)

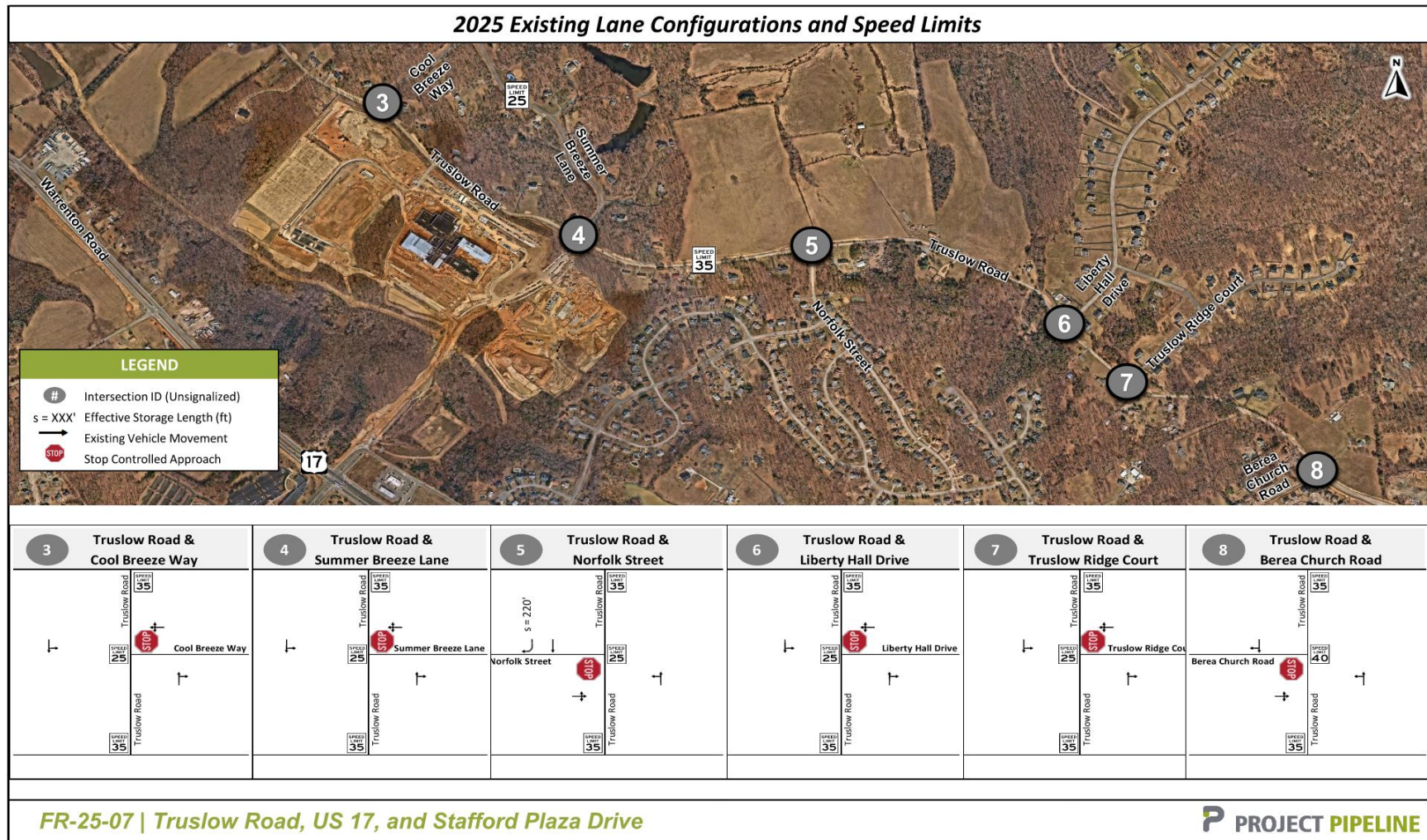


Figure 10: 2025 Existing Lane Configurations and Speed Limits (Truslow Road)

Traffic Data

Twelve-hour vehicular turning movement, pedestrian, and bicycle count data were collected at the eight study intersections on Thursday, April 17, 2025. Forty-eight-hour tube counts with speed data were collected along the Truslow Road corridor, and forty-eight-hour volume tube counts were collected along the US 17 corridor, on Wednesday, April 16, 2025 and Thursday, April 17, 2025. The AM and PM peak hours were determined to be 7:15 AM – 8:15 AM and 3:45 PM – 4:45 PM. Raw traffic data can be found in **Appendix C**.

The existing volumes that formed the basis of this study are shown in **Figure 11** and **Figure 12**. Heavy vehicle percentages and peak hour factors are included in **Figure 13** and **Figure 14**.

Speed data was collected at two different locations along Truslow Road. The northern location was between Cool Breeze Way and Summer Breeze Lane, and the southern location was between Truslow Ridge Court and Berea Church Road. The average and 85th percentile speeds recorded at each location are summarized in **Table 6**.

Table 6: Collected Truslow Road Speeds

Count Location	Direction	Posted Speed Limit (mph)	Average Speed (mph)	85 th Percentile Speed (mph)
Between Cool Breeze Way and Summer Breeze Lane (North)	NB	35	37	42
Between Cool Breeze Way and Summer Breeze Lane (North)	SB	35	36	41
Between Truslow Ridge Court and Berea Church Road (South)	NB	35	34	37
Between Truslow Ridge Court and Berea Church Road (South)	SB	35	35	39

Level of Service (LOS) Criteria

The intersection Level of Service (LOS) is a qualitative measure that describes a driver's perception of the operating conditions. LOS ratings range from A to F. LOS A indicates little or no congestion and LOS F indicates severe congestion, unstable traffic flow, and/or stop-and-go conditions.

Table 7 summarizes the LOS corresponding to the delay at unsignalized and signalized intersections as specified in the HCM. The delay criteria for LOS differs slightly for unsignalized and signalized intersections due to driver expectations and behavior. For signalized intersections, LOS is calculated as the lost travel time caused by vehicles waiting at a traffic signal. For unsignalized intersections, LOS and corresponding delay is calculated by determining the number of gaps that are available in the conflicting traffic stream, since the LOS analysis assumes that traffic on the mainline is not affected by the traffic on the side street.

Table 7: Level of Service Criteria

Level of Service	Control Delay (seconds/vehicle) - Signalized Intersection	Control Delay (seconds/vehicle) - Unsignalized Intersection
A	≤ 10.0	≤ 10.0
B	> 10.0 to 20.0	> 10.0 to 15.0
C	> 20.0 to 35.0	> 15.0 to 25.0
D	> 35.0 to 55.0	> 25.0 to 35.0
E	> 55.0 to 80.0	> 35.0 to 50.0
F	≥ 80.0	≥ 50.0

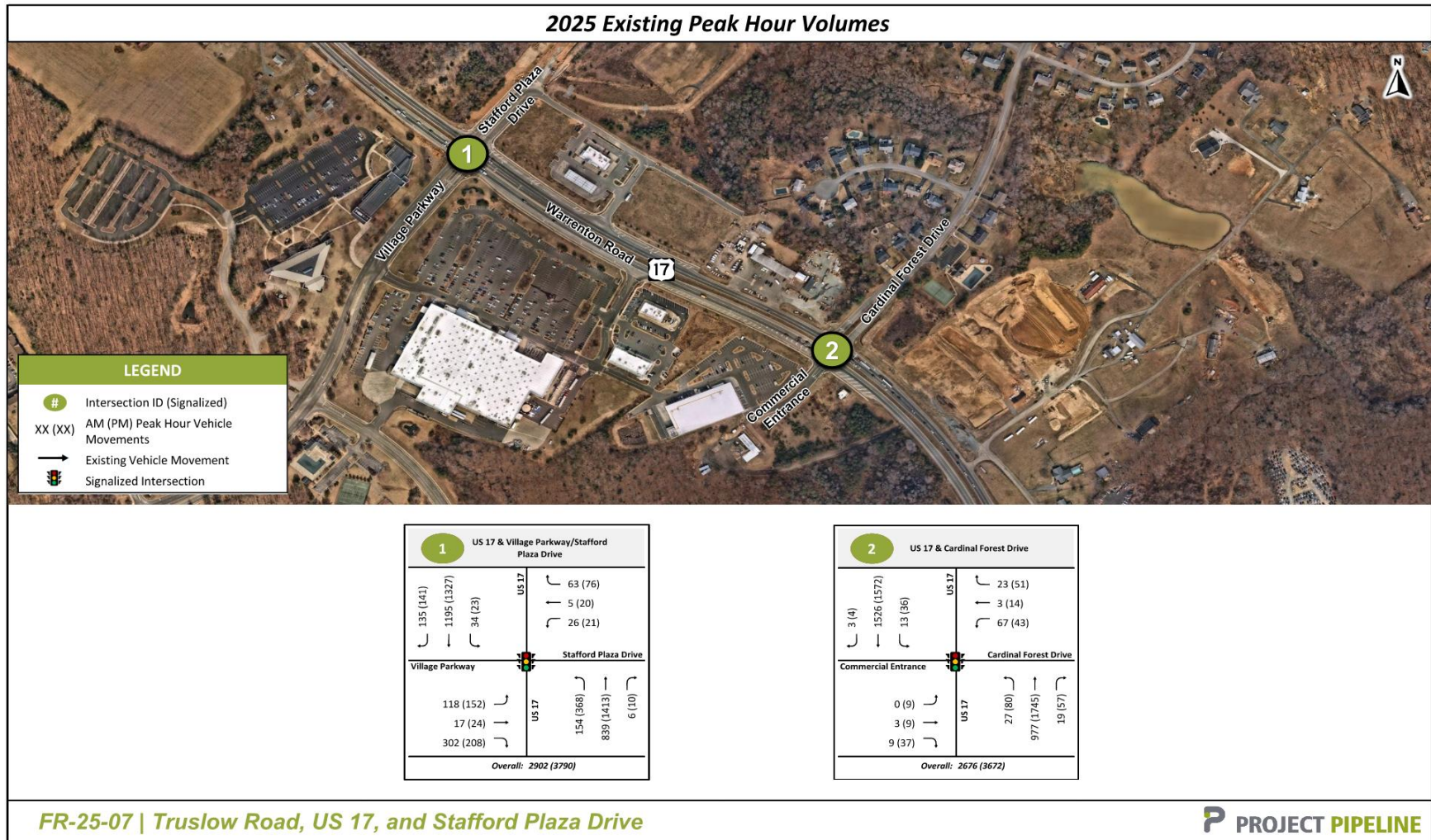


Figure 11: 2025 Existing Peak Hour Volumes (US 17)

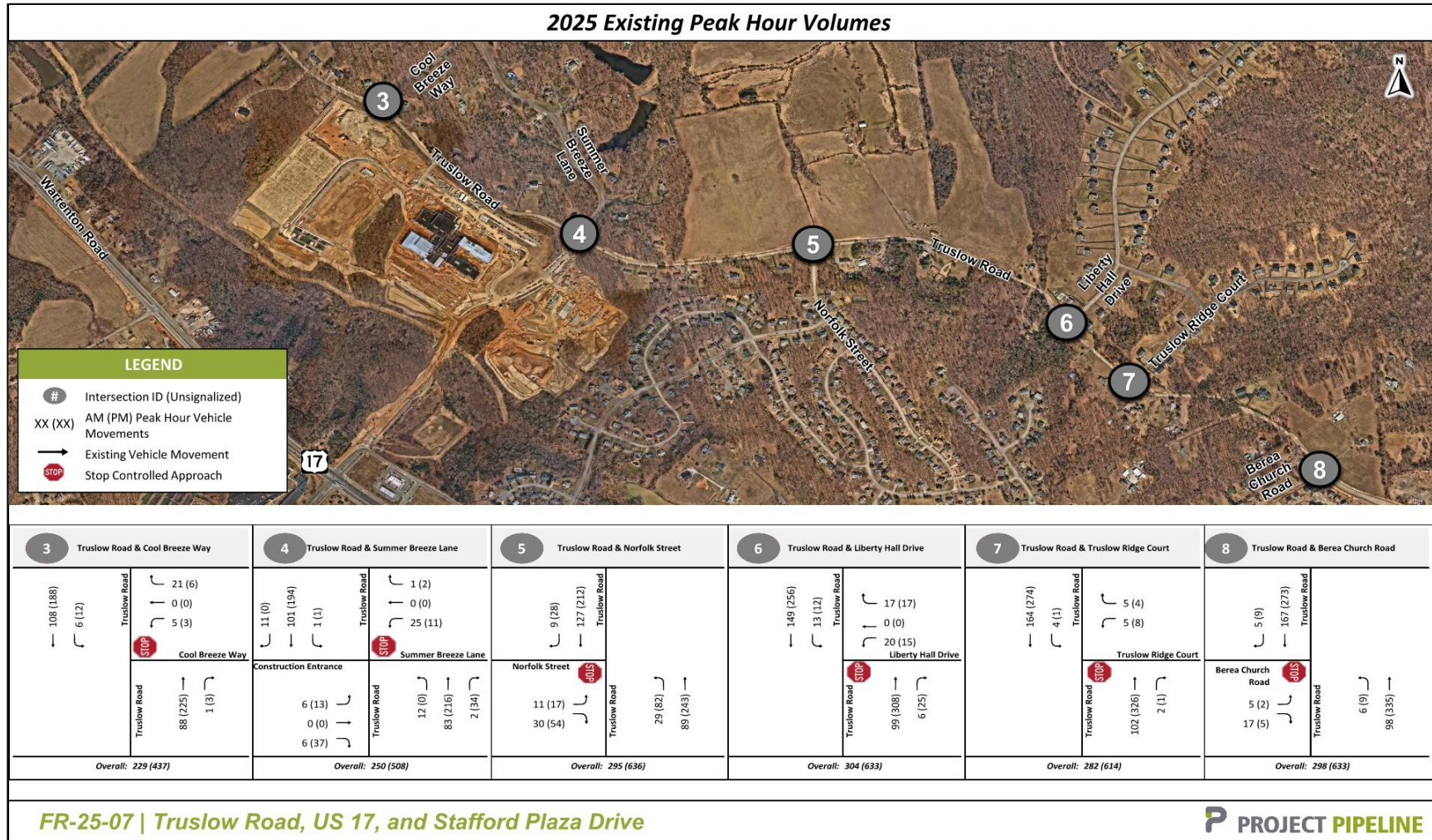


Figure 12: 2025 Existing Peak Hour Volumes (Truslow Road)

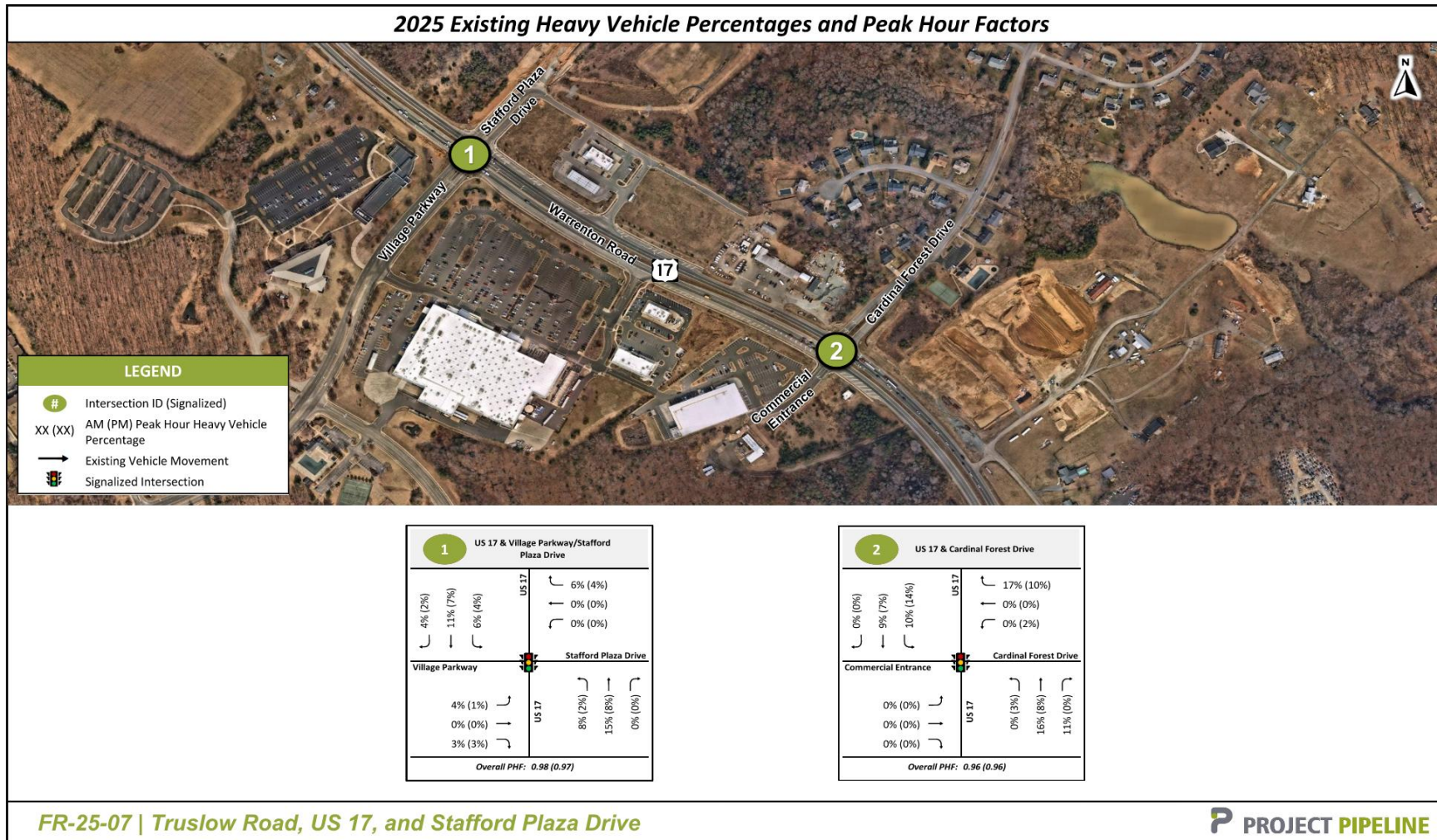


Figure 13: 2025 Existing Heavy Vehicle Percentages and Peak Hour Factors (US 17)

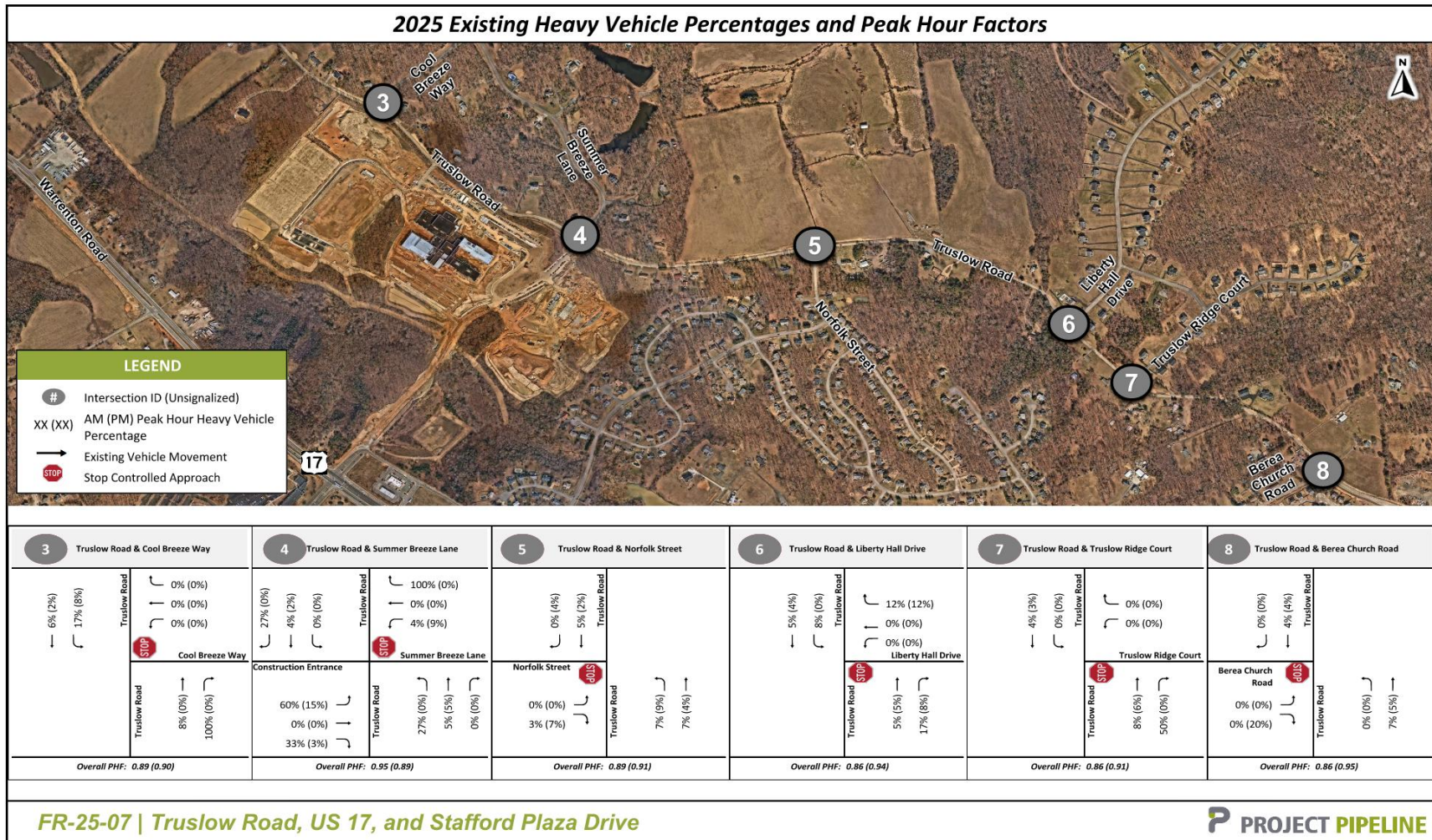


Figure 14: 2025 Existing Heavy Vehicle Percentages and Peak Hour Factors (Truslow Road)

Traffic Analysis Results

Control delay (seconds per vehicle) and 95th percentile queue length (feet) were selected as measures of effectiveness to quantitatively report the performance of each study intersection. **Table 8** summarizes the preliminary Synchro reports used to determine control delay for each intersection. Synchro peak hour control delay and LOS results for the existing condition models are included in **Table 9** and **Table 10**. Synchro peak hour 95th percentile queue lengths are included in **Table 11**. The Synchro 95th percentile queue length reports note that for a movement whose volume exceeds its calculated capacity, the actual queue length may exceed the reported value. Detailed Synchro reports are included in **Appendix C**.

Table 8: Synchro Report for Control Delay

Intersection Name	Synchro Report for Control Delay
US 17 at Village Parkway/Stafford Plaza Drive	HCM 2000 Signalized ¹
US 17 at Cardinal Forest Drive	HCM 2000 Signalized ¹
Truslow Road and Cool Breeze Way	HCM 6th TWSC
Truslow Road and Summer Breeze Lane	HCM 6th TWSC
Truslow Road and Norfolk Street	HCM 6th TWSC
Truslow Road and Liberty Hall Drive	HCM 6th TWSC
Truslow Road and Truslow Ridge Court	HCM 6th TWSC
Truslow Road and Berea Church Road	HCM 6th TWSC

Note: 1 – Intersection operates with non-standard NEMA phasing

The following results for the existing operational conditions for the intersections on US 17 and Truslow Road are noted below:

US 17 and Village Parkway/Stafford Plaza Drive

- This intersection operates with an overall LOS C in the AM and PM peak hours
- Eastbound and westbound approaches operate at LOS E in the AM and PM peak hours due to being split phased
- The southbound left-turn movement operates at LOS E in the AM and PM peak hours, while the northbound left-turn operates at LOS D
- The southbound through movement operates at LOS D in the PM peak hour, with queues that extend to 600 feet in the AM peak hour and 717 feet in the PM peak hour
- The northbound left-turn movement volume exceeds its capacity during the PM peak hour
- During the field observation, it was noted that the US 17 left-turn queues at this intersection were clearing consistently during each cycle, with few instances of queues not being fully served

US 17 and Cardinal Forest Drive

- This intersection operates with an overall LOS B in the AM and PM peak hours
- Eastbound and westbound approaches operate at LOS E in the AM and PM peak hours due to being split phased
- The northbound left-turn movement operates at LOS E and the southbound left-turn movement operates at LOS D during both peak hours.

- The northbound through queues are 414 feet in the AM peak and 931 feet in the PM peak, and the northbound left-turn movement volume exceeds its capacity in the PM peak hour.
- During the field observation, it was noted that the US 17 left-turn queues at this intersection were clearing consistently during each cycle, with few instances of queues not being fully served.

Truslow Road

- All movements at the six study intersections on Truslow Road operate at LOS B or better during the AM and PM peak hours.

1.6.2 Phase 1 Public Outreach

The Phase 1 PublicInput survey was held from May 7, 2025 to May 21, 2025 to collect feedback on existing traffic, safety, transit, and bicycle and pedestrian issues within the study area. The online survey had a total of 751 participants and received 1,070 comments. Participants ranked reducing traffic congestion and corridor safety/intersection safety as the two most important issues in the study area. Speeding/aggressive driving and lack of sidewalks/missing sidewalks were identified as the greatest safety issues. The collected speed data in **Table 6**, which indicates vehicles are traveling above the posted speed limit on Truslow Road, helps validate the public's concerns regarding speeding. Detailed results from the Phase 1 public outreach efforts can be found in **Appendix C**.

Common themes among written comments included the following:

- Truslow Road is narrow, curvy, and lacks shoulders
- Drivers travel too fast for the road conditions on Truslow Road
- Traffic from the new schools could negatively impact congestion and safety within the study area
- The Stafford Plaza Drive extension could be used as a cut-through between US 17 and Truslow Road
- Support for widening US 17 to six lanes
- Pedestrian and bicycle infrastructure along both US 17 and Truslow Road should be improved

Table 9: 2025 Existing Conditions Peak Hour Control Delay and LOS (1)

Intersection Number and Description	Lane Group	Eastbound				Westbound				Northbound				Southbound				Overall	
		AM		PM		AM		PM		AM		PM		AM		PM			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	AM	PM
US 17 at Village Parkway/Stafford Plaza Drive		Village Parkway				Stafford Plaza Drive				US 17				US 17				Intersection	
	Left	65.8	E	75.4	E	68.0	E	68.3	E	53.4	D	53.5	D	71.7	E	71.9	E	Delay	Delay
	Through	65.7	E	74.2	E	67.3	E	69.6	E	9.5	A	6.2	A	27.4	C	35.5	D	28.7	29.0
	Right	50.3	D	47.1	D	60.9	E	61.8	E	10.0	A	9.7	A	11.4	B	13.9	B	LOS	LOS
	Approach	55.1	E	59.8	E	63.2	E	64.4	E	16.3	B	15.9	B	27.0	C	34.0	C	C	C
US 17 at Cardinal Forest Drive		Commercial Entrance				Cardinal Forest Drive				US 17				US 17				Intersection	
	Left	77.0	E	75.4	E	67.2	E	72.1	E	72.4	E	79.2	E	47.1	D	42.9	D	Delay	Delay
	Through									14.7	B	24.3	C	8.9	A	7.2	A	14.1	20.0
	Right	66.0	E	60.8	E	60.4	E	64.9	E	9.7	A	9.7	A	7.9	A	8.9	A	LOS	LOS
	Approach	68.7	E	65.4	E	65.5	E	68.7	E	16.2	B	26.2	C	9.2	A	8.0	A	B	B
Truslow Road at Cool Breeze Way						Cool Breeze Way				Truslow Road				Truslow Road				Intersection	
	Left					9.1	A	10.3	B					7.6	A	7.8	A	Delay	Delay
	Through									†	†	†	†	0.0	A	0.0	A	-	-
	Right					9.1	A	10.3	B	†	†	†	†					LOS	LOS
	Approach					9.1	A	10.3	B	-	-	-	-	-	-	-	-	-	-
Truslow Road at Summer Breeze Lane						Summer Breeze Lane				Truslow Road				Truslow Road				Intersection	
	Left					9.8	A	11.5	B					7.4	A	7.8	A	Delay	Delay
	Through									†	†	†	†	0.0	A	0.0	A	-	-
	Right					9.8	A	11.5	B	†	†	†	†					LOS	LOS
	Approach					9.8	A	11.5	B	-	-	-	-	-	-	-	-	-	-

- Denotes the overall intersection is stop controlled and no level of service or delay is reported

† - SYNCHRO does not provide level of service or delay for movements with no conflicting volumes

Color coding is based on the delay reported for that movement and the analogous level of service as shown in **Table 7**.

Table 10: 2025 Existing Conditions Peak Hour Control Delay and LOS (2)

Intersection Number and Description	Lane Group	Eastbound				Westbound				Northbound				Southbound				Overall	
		AM		PM		AM		PM		AM		PM		AM		PM			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	AM	PM
Truslow Road at Norfolk Street		Norfolk Street								Truslow Road				Truslow Road				Intersection	
	Left	9.6	A	11.5	B					7.6	A	8.1	A					Delay	Delay
	Through									0.0	A	0.0	A	†	†	†	†	-	-
	Right	9.6	A	11.5	B									†	†	†	†	LOS	LOS
	Approach	9.6	A	11.5	B					-	-	-	-	-	-	-	-	-	-
Truslow Road at Liberty Hall Drive						Liberty Hall Drive				Truslow Road				Truslow Road				Intersection	
	Left					10.0	A	12.2	B					7.5	A	8.0	A	Delay	Delay
	Through									†	†	†	†	0.0	A	0.0	A	-	-
	Right					10.0	A	12.2	B	†	†	†	†					LOS	LOS
	Approach					10.0	A	12.2	B	-	-	-	-	-	-	-	-	-	-
Truslow Road at Truslow Ridge Court						Truslow Ridge Court				Truslow Road				Truslow Road				Intersection	
	Left					9.7	A	12.5	B					7.4	A	8.0	A	Delay	Delay
	Through									†	†	†	†	0.0	A	0.0	A	-	-
	Right					9.7	A	12.5	B	†	†	†	†					LOS	LOS
	Approach					9.7	A	12.5	B	-	-	-	-	-	-	-	-	-	-
Truslow Road at Berea Church Road		Berea Church Road								Truslow Road				Truslow Road				Intersection	
	Left	9.6	A	11.1	B					7.6	A	7.8	A					Delay	Delay
	Through									0.0	A	0.0	A	†	†	†	†	-	-
	Right	9.6	A	11.1	B									†	†	†	†	LOS	LOS
	Approach	9.6	A	11.1	B					-	-	-	-	0.0	A	0.0	A	-	-

- Denotes the overall intersection is stop controlled and no level of service or delay is reported

† - SYNCHRO does not provide level of service or delay for movements with no conflicting volumes

Color coding is based on the delay reported for that movement and the analogous level of service as shown in **Table 7**.

Table 11: 2025 Existing Conditions Peak Hour 95th Percentile Queues

Intersection Number and Description		Type of Control	Lane Group	95th Percentile Queues							
				Eastbound		Westbound		Northbound		Southbound	
				AM	PM	AM	PM	AM	PM	AM	PM
1	US 17 at Village Parkway/Stafford Plaza Drive	Signal		Village Parkway		Stafford Plaza Drive		US 17		US 17	
			Left	117	157	29	26	114	m#254	72	56
			Through	117	157	19	50	61	11	600	717
			Right	52	27	0	0	m0	m0	24	27
2	US 17 at Cardinal Forest Drive	Signal		Commercial Entrance		Cardinal Forest Drive		US 17		US 17	
			Left	0	s	s	s	59	#141	m19	m46
			Through	14	46	119	108	414	931	187	115
			Right	0	0	0	0	0	0	m0	m0
3	Truslow Road at Cool Breeze Way	Unsignalized		Cool Breeze Way		Truslow Road		Truslow Road		Truslow Road	
			Left			3	0			0	0
			Through					†	†	†	†
			Right			3	0	†	†		
4	Truslow Road at Summer Breeze Lane	Unsignalized		Summer Breeze Lane		Truslow Road		Truslow Road		Truslow Road	
			Left			3	3			0	0
			Through					†	†	†	†
			Right			3	3	†	†		
5	Truslow Road at Norfolk Street	Unsignalized		Norfolk Street		Truslow Road		Truslow Road		Truslow Road	
			Left	5	10			3	5		
			Through					†	†	†	†
			Right	5	10					†	†
6	Truslow Road at Liberty Hall Drive	Unsignalized		Liberty Hall Drive		Truslow Road		Truslow Road		Truslow Road	
			Left			5	5			0	0
			Through					†	†	†	†
			Right			5	5	†	†		
7	Truslow Road at Truslow Ridge Court	Unsignalized		Truslow Ridge Court		Truslow Road		Truslow Road		Truslow Road	
			Left			0	3			0	0
			Through					†	†	†	†
			Right			0	3	†	†		
8	Truslow Road at Berea Church Road	Unsignalized		Berea Church Road		Truslow Road		Truslow Road		Truslow Road	
			Left	3	0			0	0		
			Through					†	†	†	†
			Right	3	0					†	†

† - No queue reported. Movement does not have conflicting volumes

s - Lane group is a shared movement

m - Volume for 95th percentile queue is metered by upstream signal

- 95th percentile volume exceeds capacity, queue may be longer

1.6.3 No-Build Conditions Traffic Operations Analysis

Traffic operational analyses were conducted to evaluate the overall performance of the study corridor under No-Build (2050) AM and PM peak hour conditions. The intent of the No-Build conditions analysis is to provide a general understanding of the baseline future traffic conditions as a starting point for developing improvement concepts.

No-Build Traffic Forecasting and 2050 Volume Development

To forecast future (2050) traffic volumes, the study team reviewed the following sources to develop initial growth rates:

- **Fredericksburg Area MPO (FAMPO) Travel Demand Model (TDM)**
Outputs from the FAMPO TDM, which included base year data from 2022 and future year data from 2050, were adjusted using NCHRP-765 methodologies that incorporate project-specific and VDOT project traffic count data to adjust future volume projections. Using the adjusted future year (2050) TDM output and existing available count data, linear growth rates for the study area were developed.
- **Historical traffic count data**
Historical traffic count data were sourced primarily from official VDOT historical annual average daily traffic (AADT) counts. Significant development and regression trends between years were identified, outliers were removed, and a linear regression analysis was performed to produce linear growth rates for segments of US 17 and Truslow Road.

The VDOT historical AADT for the portion of US 17 within the study area increases by 85% between 2014 (38,733) and 2015 (71,633). Due to this assumed error in reported volumes—and the fact that the 2025 ADT of 42,492 collected on US 17 as part of this study aligns more closely with the pre-2015 historical VDOT AADT—only pre-2015 AADT was considered as part of the historical data analysis to calculate growth rates on US 17.
- **Previous studies**
Growth rates from the Stafford County High School #6 and Stafford Elementary School #18 TIAs as well as the Warrenton Road Widening Study were reviewed and compared to the other sources.

Figure 15 presents recommended linear growth rates and the growth rates determined from historical volume and the FAMPO TDM. Based on the analyzed data sources, a flat background growth rate of 1.00% was agreed upon by the SWG for the entire study area.

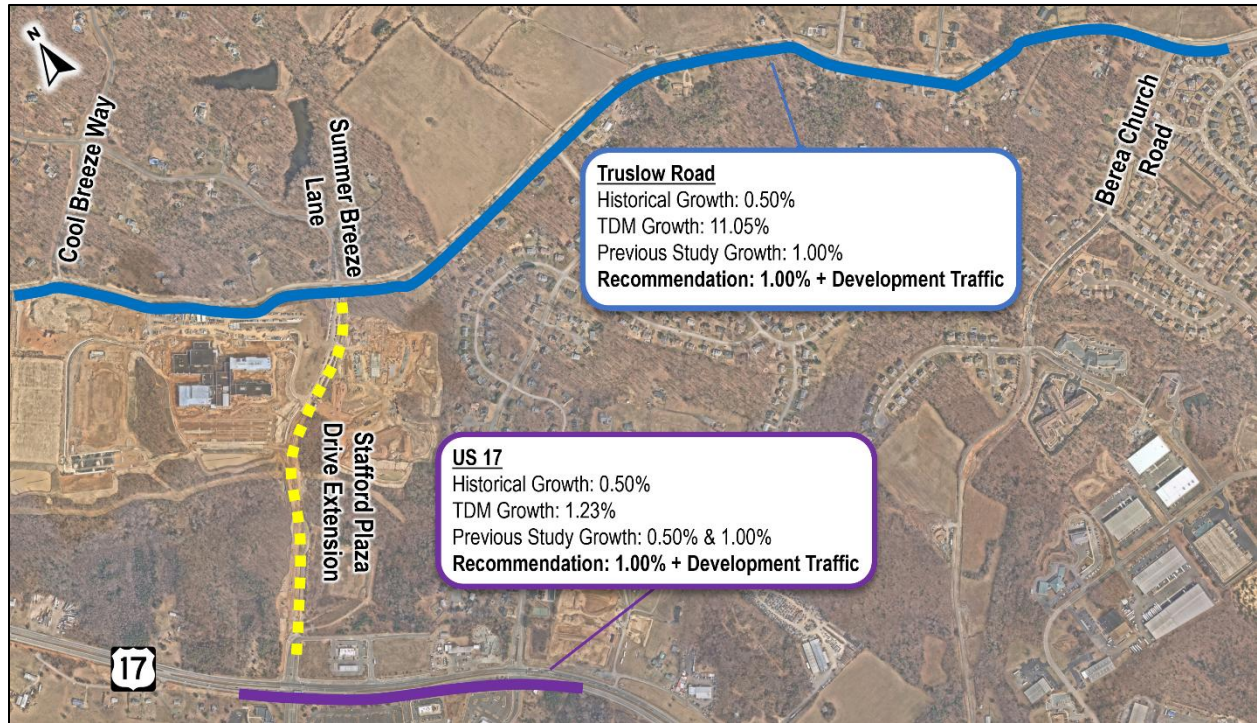


Figure 15: Study Area Linear Growth Rate Development

After the background growth rate analysis, the FAMPO base year model was revised to include the Stafford Plaza Drive extension to determine the impacts of the new connection and estimate the 2022 ADT for the extension. The 2022 ADT for the Stafford Plaza Drive extension was used in conjunction with K-factors and directional percentages obtained from available data to estimate the 2025 AM and PM peak hour volumes that would be diverted from US 17 and Truslow Road onto the new extension. The 2025 TMCs for US 17 at Village Parkway/Stafford Plaza Drive and Truslow Road at Summer Breeze Lane were then adjusted to account for this predicted diversion of vehicles, and the background growth rate was applied to the adjusted 2025 TMCs to grow them to 2050.

Once the 2050 background volumes had been developed, the study team overlaid them with trips from four new developments within the study area. The ITE Trip Generation Manual 11th Edition was used to forecast peak hour trips in and out for the following approved developments along the Stafford Plaza Drive extension:

- Hartwood High School
- Falls Run Elementary School
- Bird-Cooke Commercial (2006 TIA)
- Stafford Business Park (2006 TIA)

The traffic forecasting growth rate and future volume development approach were approved by VDOT Transportation and Mobility Planning Division on September 24, 2025, and was presented in a stakeholder meeting on October 15, 2025. The full presentation is included in **Appendix D**. The No-Build (2050) AM and PM peak hour volumes are shown in **Figure 16** and **Figure 17**.

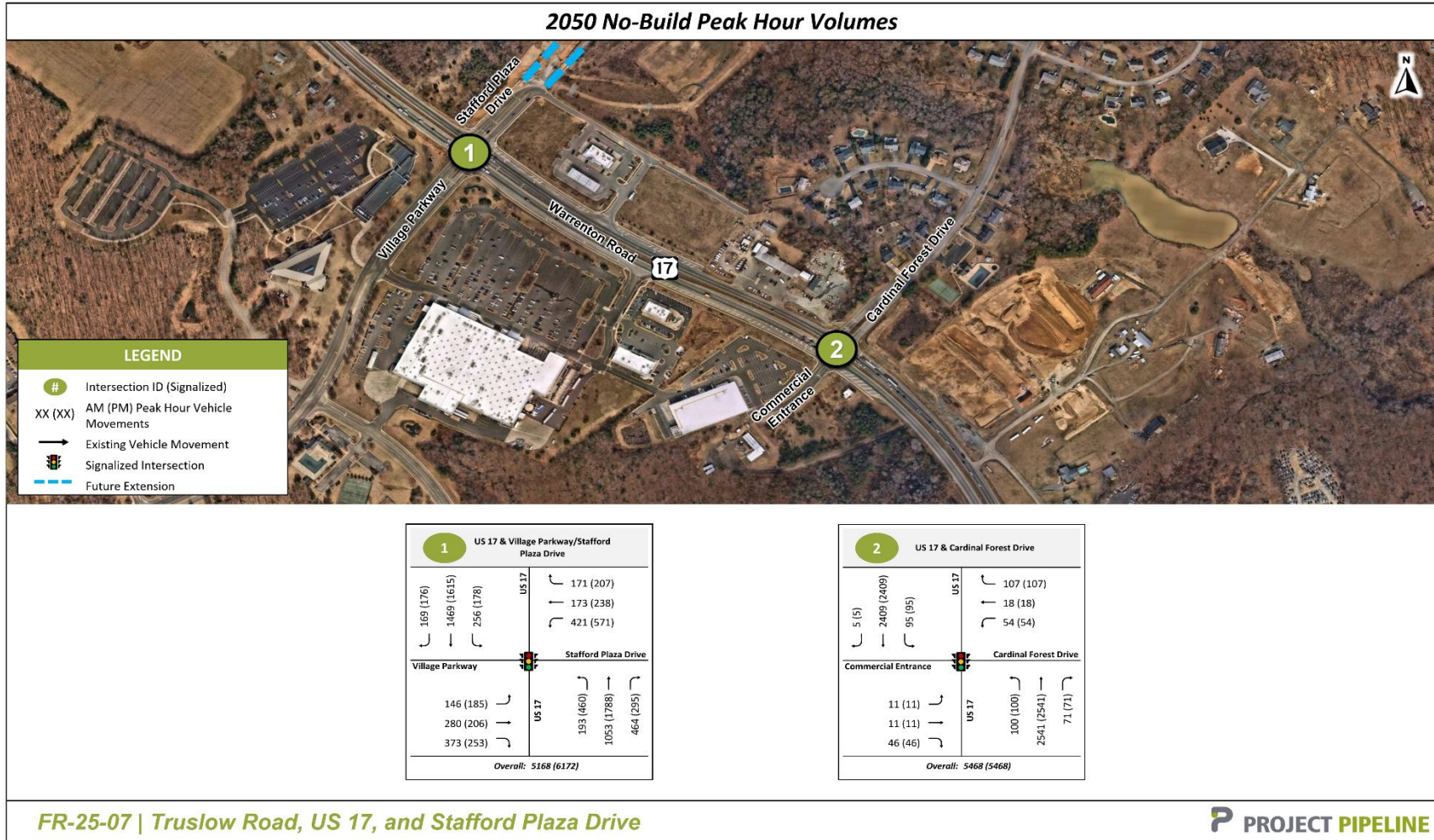


Figure 16: 2050 No-Build Peak Hour Volumes (1)

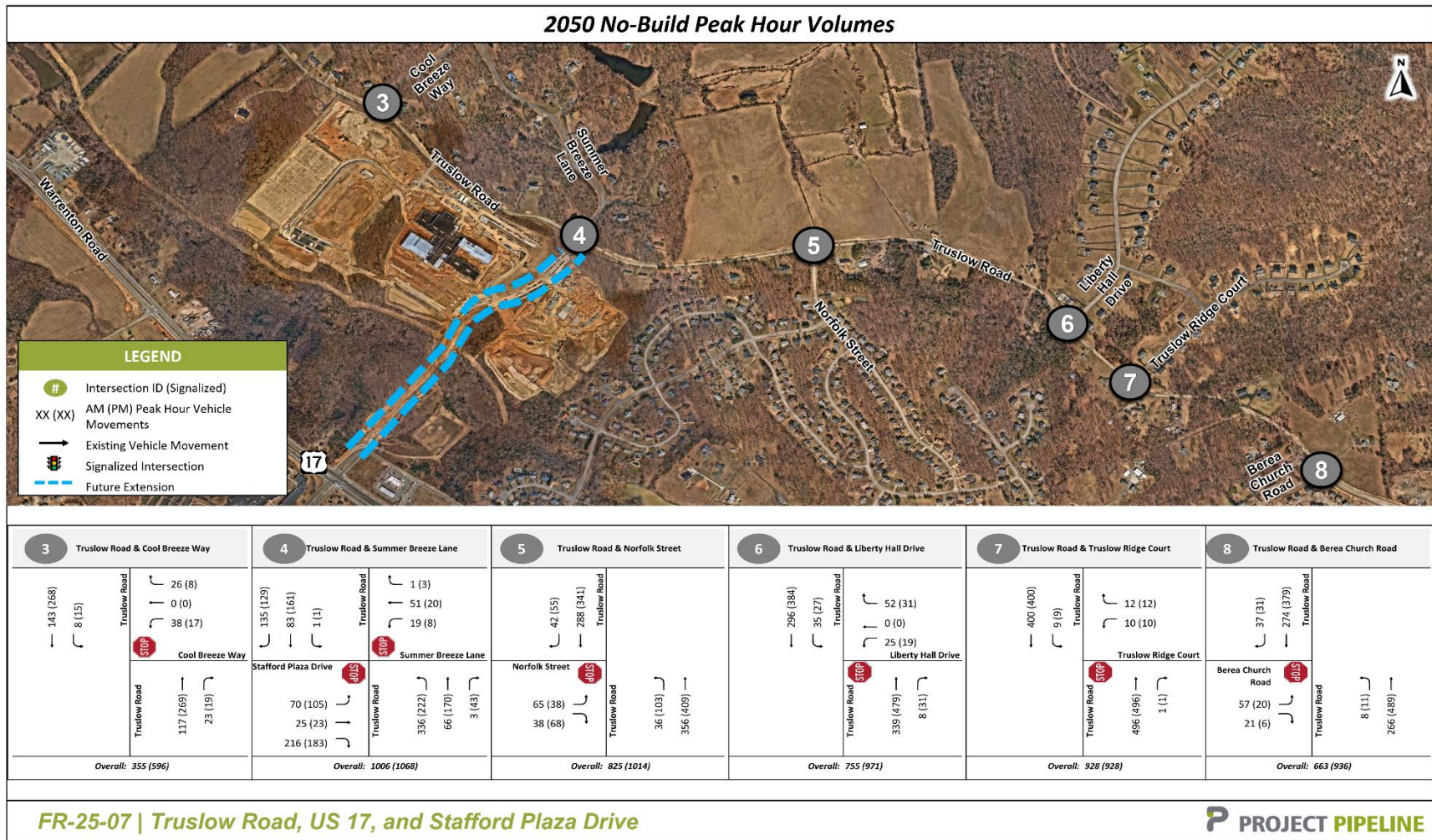


Figure 17: 2050 No-Build Peak Hour Volumes (2)

No-Build Conditions Synchro Analysis

Traffic operational analyses were conducted to evaluate the overall performance of the study intersections under No-Build (2050) AM and PM peak hour conditions. No-Build conditions were modeled using Synchro 11 for the entire study area.

The existing conditions Synchro models were used as a basis to develop the No-Build models for the AM and PM peak hour conditions. The models were updated with the projected 2050 No-Build traffic volumes and the anticipated extension of Stafford Plaza Drive, which includes a second southbound left-turn lane on US 17 at Stafford Plaza Drive and new northbound and southbound left-turn lanes and a southbound right-turn lane on Truslow Road at Summer Breeze Lane. These are programmed improvements that were assumed to be in place before the 2050 future analysis year. Traffic signal cycle lengths were assumed to be consistent with existing conditions, while splits and offsets were optimized. No-Build inputs and analysis methodologies were applied consistently with TOSAM.

Control delay (seconds per vehicle) and 95th percentile queue length (feet) were selected as measures of effectiveness to quantitatively report the performance of each study intersection. Synchro reports used for control delay were consistent with methodologies reported for existing conditions and are summarized in **Table 8**. The full Synchro reports are included in **Appendix D** and shown in **Table 12** and **Table 13**. The results for the existing operational conditions for the intersections on US 17 and Truslow Road are noted below.

US 17 and Village Parkway/Stafford Plaza Drive

- This intersection is projected to operate with an overall LOS E in the AM peak hour and LOS F in the PM peak hour
- Eastbound and westbound approaches are projected to operate at LOS F in the AM and PM peak hours
- The westbound left-turn movement is projected to exceed its calculated capacity during the AM and PM peak hours, and the eastbound left-turn movement volume is projected to exceed its capacity during the PM peak hour
- The northbound and southbound left-turn movements are projected to operate at LOS F in the AM and PM peak hours, and both movement volumes are projected to exceed their capacity during the AM and PM peak hours
- The southbound through movement is projected to operate at LOS E in the AM peak hour and LOS F in the PM peak hour, with projected queues of 930 feet in the AM peak hour and 1,144 feet in the PM peak hour
- The northbound through movement is projected to operate at LOS E in the PM peak hour

US 17 and Cardinal Forest Drive

- This intersection is projected to operate with an overall LOS D in the AM peak hour and LOS F in the PM peak hour
- The eastbound approach is projected to operate at LOS E in the AM and PM peak hours
- The westbound approach is projected to operate at LOS E in the AM peak hour and LOS F in the PM peak hour
- The northbound and southbound left-turn movements are projected to operate at LOS E in the AM peak hour and LOS F in the PM peak hour

PROJECT PIPELINE

- In the PM peak hour, the northbound through movement is projected to operate at LOS F and the southbound through movement is projected to operate at LOS E
- The northbound through queues are projected to be 921 feet in the AM peak and 1,748 feet in the PM peak, and the northbound left-turn movement volume is projected to exceed its capacity in the PM peak hour

Truslow Road

- At the intersection of Truslow Road and Stafford Plaza Drive/Summer Breeze Lane, the eastbound left/through movement is projected to operate at LOS F in the AM peak hour and LOS E in the PM peak hour, and the westbound approach is projected to operate at LOS E in the AM peak hour and LOS D in the PM peak hour
- All movements at the other study intersections on Truslow Road are projected to operate at LOS C or better during the AM and PM peak hours

Table 12: 2050 No-Build Conditions Peak Hour Control Delay and LOS

Intersection Number and Description	Lane Group	Eastbound				Westbound				Northbound				Southbound				Overall	
		AM		PM		AM		PM		AM		PM		AM		PM			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	AM	PM
US 17 at Village Parkway/Stafford Plaza Drive		Village Parkway				Stafford Plaza Drive				US 17				US 17				Intersection	
	Left	62.5	E	115.6	F	173.8	F	340.0	F	108.6	F	134.0	F	84.3	F	218.7	F	Delay	Delay
	Through	185.8	F	194.8	F	98.4	F	190.0	F	26.7	C	57.8	E	69.6	E	119.4	F	69.5	117.9
	Right	51.5	D	47.3	D	48.2	D	57.6	E	6.7	A	3.7	A	13.4	B	17.6	B	LOS	LOS
	Approach	102.9	F	116.3	F	128.7	F	247.4	F	30.5	C	65.3	E	66.6	E	119.3	F	E	F
US 17 at Cardinal Forest Drive		Commercial Entrance				Cardinal Forest Drive				US 17				US 17				Intersection	
	Left	71.7	E	79.8	E	92.9	F	200.6	F	72.0	E	85.5	F	60.2	E	138.8	F	Delay	Delay
	Through									25.0	C	98.5	F	41.6	D	73.3	E	36.9	87.0
	Right	64.0	E	60.2	E	63.9	E	70.6	E	8.7	A	7.7	A	7.2	A	7.6	A	LOS	LOS
	Approach	66.1	E	66.4	E	77.5	E	123.0	F	25.7	C	95.6	F	42.0	D	75.6	E	D	F
Truslow Road at Cool Breeze Way						Cool Breeze Way				Truslow Road				Truslow Road				Intersection	
	Left					10.2	B	12.5	B	-	-	-	-	7.7	A	8.0	A	Delay	Delay
	Through									†	†	†	†	0.0	A	0.0	A	-	-
	Right					10.2	B	12.5	B	†	†	†	†	-	-	-	-	LOS	LOS
	Approach					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Truslow Road at Summer Breeze Lane		Stafford Plaza Drive				Summer Breeze Lane				Truslow Road				Truslow Road				Intersection	
	Left	52.1	F	46.3	E	40.5	E	25.1	D	8.2	A	8.1	A	7.3	A	7.7	A	Delay	Delay
	Through												†	†	†	†	†	†	†
	Right	9.9	A	10.4	B					†	†	†	†	†	†	†	†	LOS	LOS
	Approach	25.2	D	25.2	D	40.5	E	25.1	D	6.8	A	4.1	A	0.0	A	0.0	A	-	-
Truslow Road at Norfolk Street		Norfolk Street								Truslow Road				Truslow Road				Intersection	
	Left	16.1	C	18.2	C					8.2	A	8.7	A					Delay	Delay
	Through									0.0	A	0.0	A	†	†	†	†	-	-
	Right	16.1	C	18.2	C									†	†	†	†	LOS	LOS
	Approach	-	-	-	-					-	-	-	-	-	-	-	-	-	-
Truslow Road at Liberty Hall Drive						Liberty Hall Drive				Truslow Road				Truslow Road				Intersection	
	Left					13.4	B	16.0	C					8.2	A	8.6	A	Delay	Delay
	Through									†	†	†	†	0.0	A	0.0	A	-	-
	Right					13.4	B	16.0	C	†	†	†	†					LOS	LOS
	Approach					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Truslow Road at Truslow Ridge Court						Truslow Ridge Court				Truslow Road				Truslow Road				Intersection	
	Left					11.3	B	15.3	C					8.0	A	8.5	A	Delay	Delay
	Through									†	†	†	†	0.0	A	0.0	A	-	-
	Right					11.3	B	15.3	C	†	†	†	†					LOS	LOS
	Approach					-	-	-	-	-	-	-	-	-	-	-	-	-	-
Truslow Road at Berea Church Road		Berea Church Road								Truslow Road				Truslow Road				Intersection	
	Left	13.7	B	17.1	C					7.9	A	8.2	A					Delay	Delay
	Through									0.0	A	0.0	A	†	†	†	†	-	-
	Right	13.7	B	17.1	C									†	†	†	†	LOS	LOS
	Approach	13.7	B	17.1	C					-	-	-	-	0.0	A	0.0	A	-	-

- Denotes the overall intersection is stop controlled and no level of service or delay is reported

† - SYNCHRO does not provide level of service or delay for movements with no conflicting volumes

Color coding is based on the delay reported for that movement and the analogous level of service as shown in Table 7.

Table 13: 2050 No-Build Conditions Peak Hour 95th Percentile Queues

Intersection Number and Description		Type of Control	Lane Group	95th Percentile Queues							
				Eastbound		Westbound		Northbound		Southbound	
				AM	PM	AM	PM	AM	PM	AM	PM
1	US 17 at Village Parkway/Stafford Plaza Drive	Signal		Village Parkway		Stafford Plaza Drive		US 17		US 17	
			Left	204	#337	#362	#544	m#144	m#236	#200	#197
			Through	#564	#471	#307	#468	432	m648	#930	#1144
			Right	105	56	48	95	m65	m25	41	57
2	US 17 at Cardinal Forest Drive	Signal		Commercial Entrance		Cardinal Forest Drive		US 17		US 17	
			Left	0	s	s	s	71	#257	m61	m#95
			Through	17	53	#182	#194	#921	#1748	m#1258	m367
			Right	0	0	0	0	0	0	m0	m0
3	Truslow Road at Cool Breeze Way	Unsignalized		Cool Breeze Way		Truslow Road		Truslow Road		Truslow Road	
			Left			8	5			0	0
			Through					†	†	†	†
			Right			3	0	†	†		
4	Truslow Road at Summer Breeze Lane	Unsignalized		Stafford Plaza Drive		Summer Breeze Lane		Truslow Road		Truslow Road	
			Left	s	s	50	15	25	15	0	0
			Through	80	95			†	†	†	†
			Right	25	23			†	†	†	†
5	Truslow Road at Norfolk Street	Unsignalized		Norfolk Street				Truslow Road		Truslow Road	
			Left	25	30			3	8		
			Through					†	†	†	†
			Right	5	10					†	†
6	Truslow Road at Liberty Hall Drive	Unsignalized		Liberty Hall Drive		Truslow Road		Truslow Road		Truslow Road	
			Left			15	13			3	3
			Through					†	†	†	†
			Right			5	5	†	†		
7	Truslow Road at Truslow Ridge Court	Unsignalized		Truslow Ridge Court		Truslow Road		Truslow Road		Truslow Road	
			Left			5	5			0	0
			Through					†	†	†	†
			Right			0	3	†	†		
8	Truslow Road at Berea Church Road	Unsignalized		Berea Church Road		Truslow Road		Truslow Road		Truslow Road	
			Left	15	8			0	0		
			Through					†	†	†	†
			Right	3	0					†	†

† - No queue reported. Movement does not have conflicting volumes

s - Lane group is a shared movement

m - Volume for 95th percentile queue is metered by upstream signal

- 95th percentile volume exceeds capacity, queue may be longer

1.7 Phase 1 Alternatives Development

The study team developed preliminary alternatives in parallel with the high-level needs diagnosis efforts documented in **Chapter 1.5**. Stafford County informed the study team that they were also conducting a separate traffic study focusing on alternatives for US 17 between Stafford Lakes Parkway and Village Parkway, including widening US 17. To avoid overlapping with this study, the Project Pipeline study team did not propose any Phase 1 alternatives involving widening on US 17. The proposed Phase 1 alternatives were developed to meet the following criteria:

- Improve operations at intersections
- Mitigate safety issues
- Enhance bike and pedestrian access

1.7.1 Initial Alternatives

The needs evaluation, diagnosis, and initial alternatives were presented in SWG Meeting #2, held on June 12, 2025. Eleven total alternatives for the US 17 and Truslow Road corridors were presented during the meeting, which are summarized in **Table 14**.

Table 14: Phase 1 Alternatives

Location	Alternative	Description
US 17 and Village Parkway/Stafford Plaza Drive	Turn Lane Improvements	Convert the eastbound and westbound approaches' lane configurations to be one left-turn lane, two through lanes, and one right-turn lane
	Pedestrian Accommodations	Add a new crosswalk across Stafford Plaza Drive on the east leg of the intersection, and add pedestrian signals for the previously-recommended crosswalk across US 17 on the south leg of the intersection
US 17 and Cardinal Forest Drive	Thru-Cut	Convert the existing intersection to a thru-cut
	Pedestrian Accommodations	Add pedestrian signals for the previously-recommended crosswalk across US 17 on the south leg of the intersection
Truslow Road Corridor	S-Curve Reconstruction (Three Alignments Options)	Soften the existing S-curve on Truslow Road north of Summer Breeze Lane and increase the curves' radii. Three different alignment options with different curve radii were considered.
	Shared-Use Path	Construct a 10-foot shared-use path along the west side of Truslow Road
	Rumble Strips	Add rumble strips along Truslow Road
	Roadway Widening (Lane and Shoulder Improvements)	Increase travel lanes to 11–12 feet in width with paved shoulders and/or curb and gutter along Truslow Road
Truslow Road and Stafford Plaza Drive/Summer Breeze Lane	Roundabout	Convert the existing intersection to a roundabout

1.7.2 Phase 1 Alternative Summary

The Phase 1 alternative development results summarized in **Figure 18** and **Figure 19** were presented at the Preliminary Concepts Refinement and Phase 2 Scoping Meeting (SWG Meeting #3), held on July 1, 2025, where it was decided which concepts would move forward to Phase 2. It was determined that the recommendations for improvements to the US 17 at Cardinal Forest Drive and US 17 at Village Parkway/Stafford Plaza Drive intersections would be included in the other study effort. Beyond Phase 1, the Project Pipeline study team focused on developing alternatives for Truslow Road. The SWG agreed to carry alternatives on Truslow Road forward to Phase 2 for further refinement.

Table 15 summarizes the alternatives considered in Phase 1 and provides justification for carrying the alternative forward to Phase 2. **Figure 18** and **Figure 19** shows the preliminary alternatives graphically categorized by the needs addressed by the alternative. The meeting materials can be found in **Appendix E**.

Table 15: Phase 1 Alternatives to Move Forward to Phase 2

Location	Alternative	Move Forward to Phase 2?	Justification
US 17 and Village Parkway/ Stafford Plaza Drive	Turn Lane Improvements	No	SWG agreed to not recommend any alternatives on the US 17 corridor
	Pedestrian Accommodations	No	SWG agreed to not recommend any alternatives on the US 17 corridor
US 17 and Cardinal Forest Drive	Thru-Cut	No	SWG agreed to not recommend any alternatives on the US 17 corridor
	Pedestrian Accommodations	No	SWG agreed to not recommend any alternatives on the US 17 corridor
Truslow Road Corridor	S-Curve Reconstruction (Three Alignments Options)	Yes	Addresses safety need
	Shared-Use Path	Yes	Addresses safety and bicycle access needs and should be included with lane and shoulder improvements
	Rumble Strips	No	Low cost option and would need to be done with shoulder widening. Can be included as part of roadway widening as a design element if desired.
	Roadway Widening (Lane and Shoulder Improvements)	Yes	Addresses safety need and should be included with shared-use path
Truslow Road and Stafford Plaza Drive/Summer Breeze Lane	Roundabout	Yes	Addresses safety need

Potential Improvement Concepts: US 17



Figure 18: Phase 1 Scoping Level Improvement Alternatives for US 17

Potential Improvement Concepts: Truslow Road

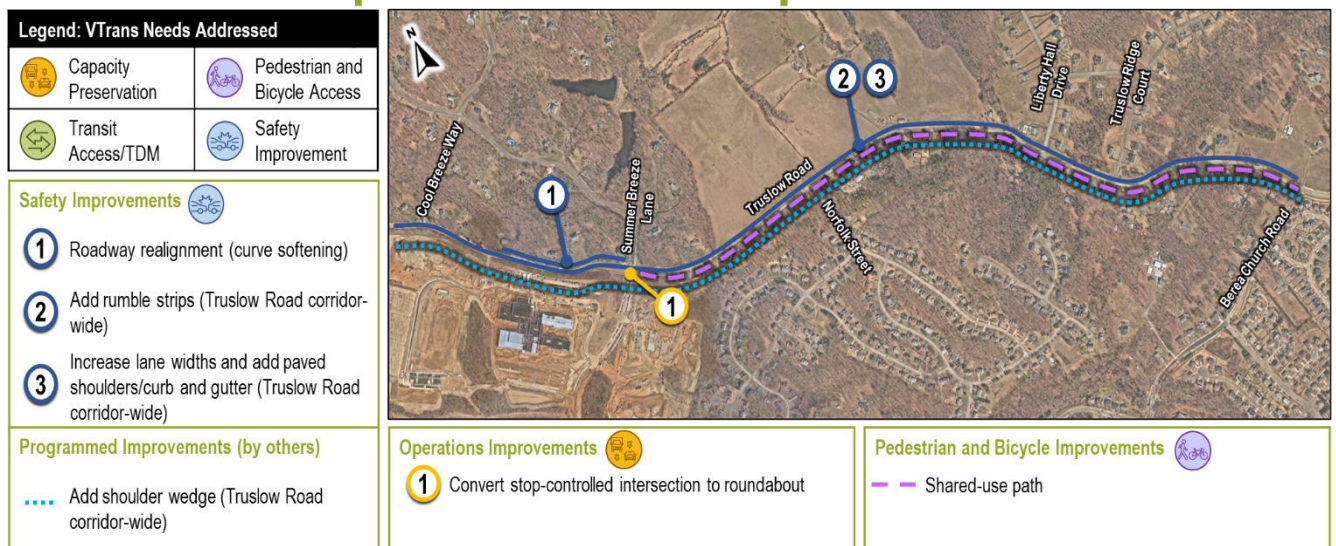


Figure 19: Phase 1 Scoping Level Improvement Alternatives for Truslow Road

Chapter 2: Alternatives Refinement

2.1 Alternatives Refinement Overview

The study team refined the alternatives carried forward in Phase 2 including concept drawings, cost estimates, and concept screening traffic operations and safety analysis. The primary goal of the Phase 2 alternatives refinement effort was to prepare a refined set of alternatives to present to the public and solicit feedback. The study team compared each alternative across several metrics using the Virginia iCAP Assessment Tool including traffic operations, safety, pedestrian and bicycle access, and cost to determine the refined list of alternatives to present to the public.

The Concept Screening Refinements and Results Meeting (SWG Meeting #4) was held on October 15, 2025 to review the revised concepts and to share the concept screening results in advance of public outreach. During the meeting, the study team discussed each alternative based on impacts to safety, traffic operations, cost, and right-of-way impacts and chose which concepts to be shared during public outreach. Both presentations, along with the detailed concept benefits, are included in **Appendix E**.

2.2 Phase 2 Alternatives Description

The following section gives a description of each of the alternatives and provides a conceptual sketch of the alternative.

Roundabout

This concept would add a single-lane roundabout at the intersection of Stafford Plaza Drive/Summer Breeze Lane and Truslow Road to improve operations in the area considering the school developments. In addition to offering operational benefits over the two-way stop-controlled intersection that is being constructed, the roundabout would also improve safety by reducing the number of conflict points and decreasing vehicle speed through the intersection. A shared-use path would be provided (recommendation from a separate study) along Truslow Road on the east side of Stafford Plaza Drive. The concept would also include pedestrian crossing accommodations such as marked crosswalks, splitter island refuges, and appropriate lighting, with additional treatments incorporated during design as warranted. Finally, this concept has been designed to accommodate design vehicles, including school buses, emergency vehicles, and heavy trucks, with turning movements evaluated to support operational feasibility. **Figure 20** presents a conceptual sketch of the alternative.

S-Curve Alignment

This concept would flatten the curves along the west leg of Truslow Road at Stafford Plaza Drive/Summer Breeze Lane near the new high school development and would realign Truslow Road. This improvement would help vehicles navigate the road at a consistent speed to improve safety. **Figure 21** presents a conceptual sketch of the alternative.

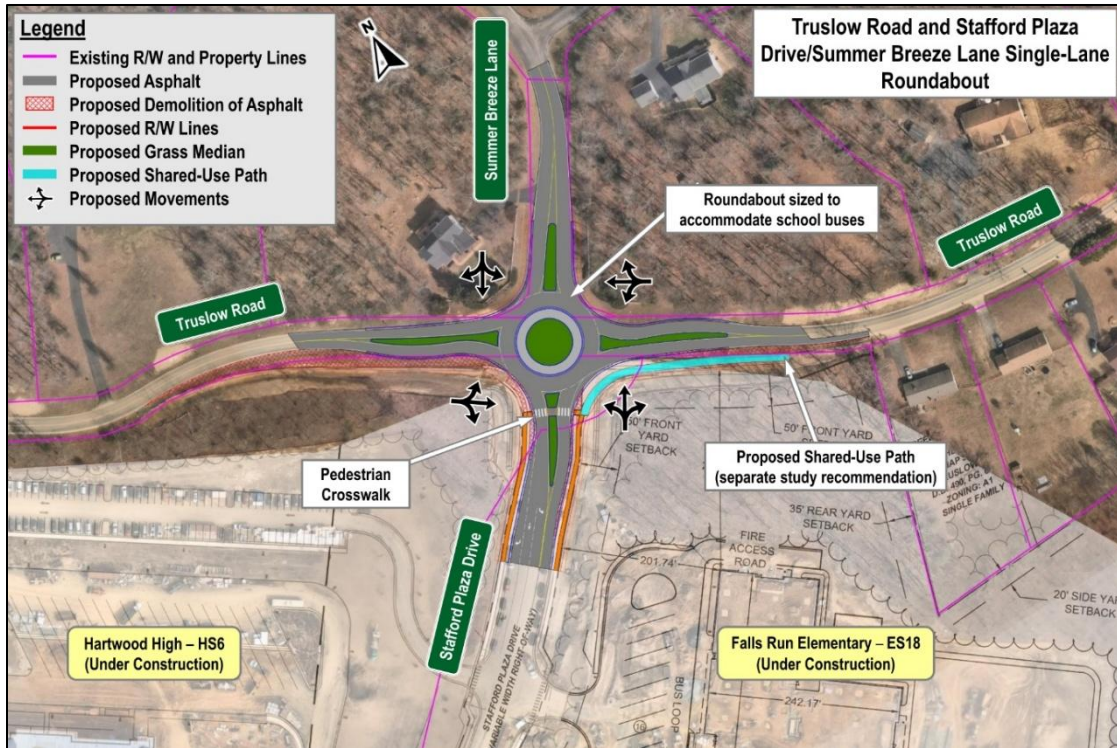


Figure 20: Phase 2 Alternative—Roundabout

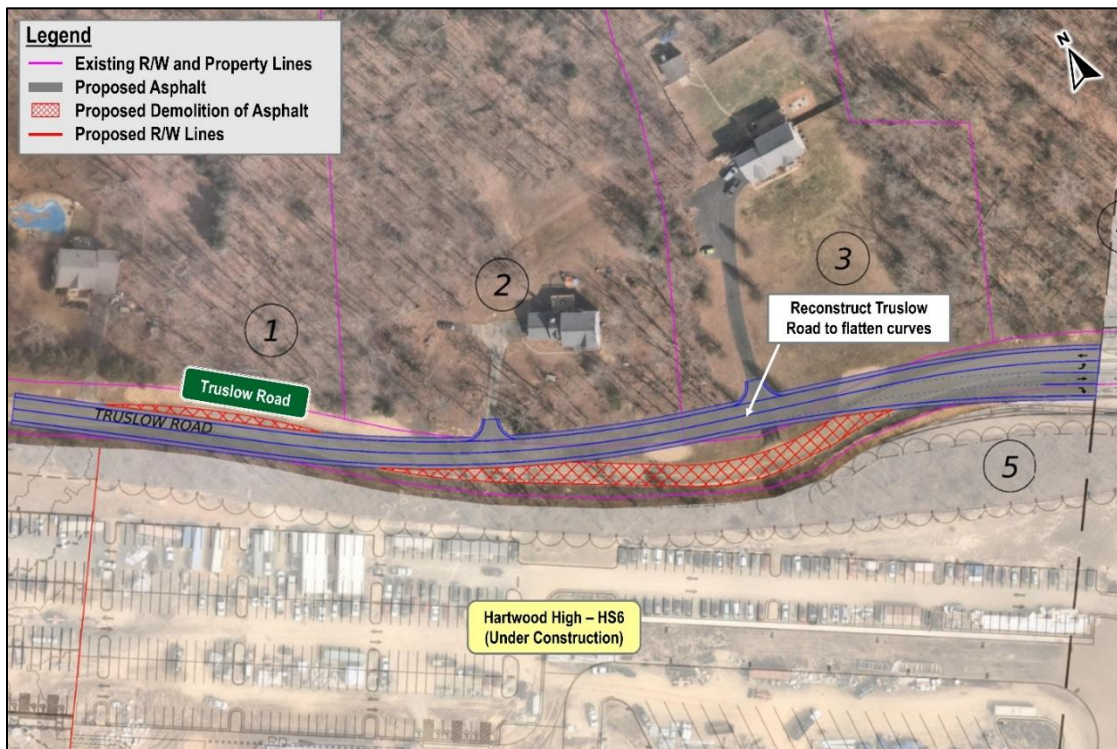


Figure 21: Phase 2 Alternative—S-Curve Realignment

Shared-Use Path

This concept would involve widening the typical section of Truslow Road to the south to construct a 10 foot-wide shared-use path along Truslow Road between Summer Breeze Lane and Berea Church Road. The shared-use path would provide pedestrian and bicycle facilities and connect the proposed sidewalks near the new schools and the existing shared-use path on Truslow Road south of Berea Church Road. Larger vehicular lanes and dedicated spaces for pedestrians and cyclists to travel along Truslow Road would allow for a safer corridor considering the new schools. **Figure 22** presents a conceptual sketch of the alternative.

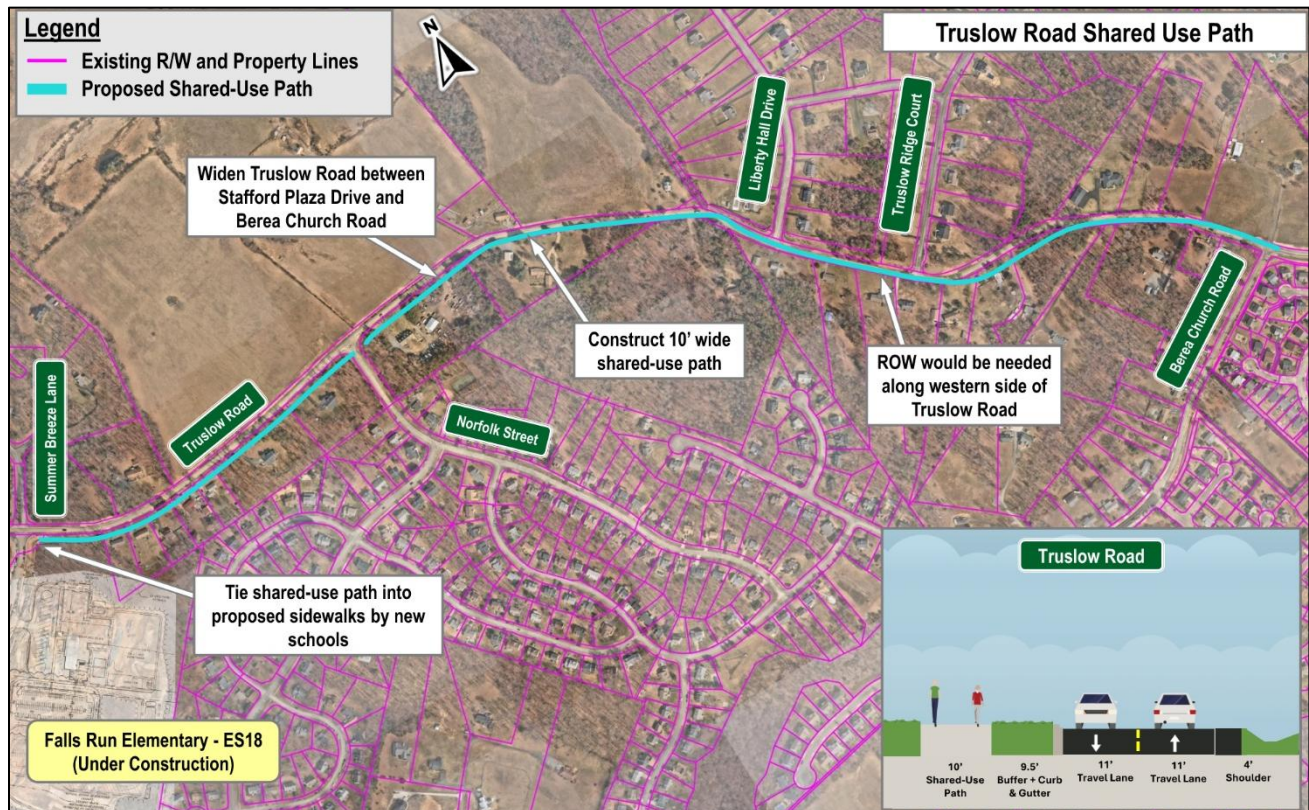


Figure 22: Phase 2 Alternative—Shared-Use Path

2.3 Traffic Operations and Safety Results

Alternatives Traffic Operations and Safety Results

Intersection operations for the roundabout were evaluated to compare projected operations between No-Build using Synchro 11 and SIDRA. The study team analyzed AM and PM future year (2050) traffic volumes to evaluate the operational benefits of the alternative. Control delay (seconds per vehicle) and maximum queue length (feet) were used as measures of effectiveness. The results were provided using SIDRA for the roundabout configuration analysis at the intersection of Truslow Road and Stafford Plaza Drive/Summer Breeze Lane. **Table 16** summarizes the traffic operations results for the roundabout at the intersection of Truslow Road and Stafford Plaza Drive/Summer Breeze Lane.

Table 16: SIDRA Roundabout Traffic Operations Results

Lane Group	Eastbound			Westbound			Northbound			Southbound		
	No-Build Delay (s)	Build Delay (s)	Δ from No-Build	No-Build Delay (s)	Build Delay (s)	Δ from No-Build	No-Build Delay (s)	Build Delay (s)	Δ from No-Build	No-Build Delay (s)	Build Delay (s)	Δ from No-Build
	Stafford Plaza Drive			Summer Breeze Lane			Truslow Road			Truslow Road		
AM Peak Hour												
Approach	25.2	6.1	-19.1	40.5	6.0	-34.5	6.8	7.2	+0.4	0.0	7.9	+7.9
PM Peak Hour												
Approach	25.2	6.9	-18.3	25.1	5.7	-19.4	4.1	8.2	+4.1	0.0	7.5	+7.5

The study team reviewed crash modification factors (CMFs) to determine the potential safety benefits for each alternative. CMFs are used to estimate the expected change in the number of crashes after a specific countermeasure is implemented. They are calculated as the ratio of crashes with the countermeasure to the number of crashes without the countermeasure. A CMF of 1.00 means that there is no expected change, a CMF less than 1.00 means there is an expected reduction in crashes, and a CMF greater than 1.00 means there is an expected increase in crashes (e.g., a CMF of 0.6 means the countermeasure is projected to reduce crashes by 40%). CMFs were selected from the SMART SCALE Planning Level CMF List from Round 6. The CMF resulting in the highest anticipated crash reduction was applied to fatal and injury crashes within the influence area of each alternative, as shown in **Table 17**. There is no applicable crash history at the intersection of Truslow Road and Summer Breeze Lane and no recorded bicycle or pedestrian crashes along the segment where the shared-use path is proposed; therefore, no crash reduction is anticipated for these improvements.

Table 17: CMF and Crash Reduction Summary

Alternative	Fatal + Injury Crash (F+I) CMF	Annual Crash Reduction (F+I per year)
Roundabout	0.56	*
S-Curve	0.85	1.0
Shared-Use Path	0.598**, 0.41***	*

Notes: * No applicable crash history; therefore, an annual crash reduction was not calculated

** Apply CMF to crashes involving pedestrians

*** Apply CMF to crashes involving bicycles

2.4 Phase 2 Public Involvement

The Phase 2 PublicInput survey was held from November 10, 2025 to November 24, 2025, to collect feedback on the potential improvements within the study corridor. The online survey had a total of 280 participants and received 91 comments. The improvements presented in the survey were the same improvements outlined in **Section 2.2** constructing a roundabout at the intersection of Truslow Road and Stafford Plaza Drive/Summer Breeze Lane, reconstructing the S-curve on Truslow Road north of Summer Breeze Lane, and constructing a shared-use path along the west side of Truslow Road. The survey provided the study team with an understanding of how the public viewed each alternative before selecting the preferred alternative. **Figure 23** summarizes the average ranking for the roundabout alternative at the intersection of Truslow Road and Stafford Plaza Drive/Summer Breeze Lane presented in the survey

against a do nothing alternative. A rating of 5.0 represents a strongly supported concept and a rating of 1.0 represents a strongly opposed concept.

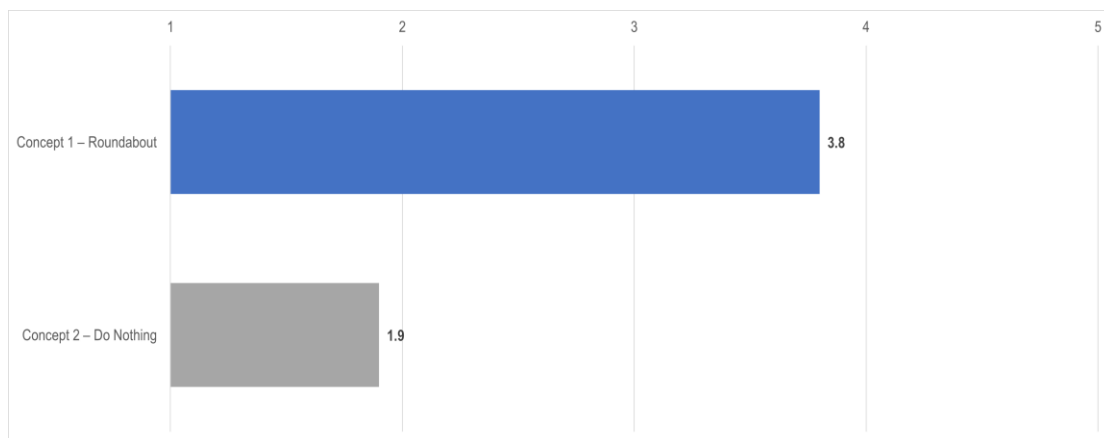


Figure 23: Public Engagement—Average Rating of Alternatives

As shown in **Figure 23**, the public supported the roundabout concept, with an average rating of 3.8. **Figure 24** summarizes the public's rating of the roundabout concept. Of 268 respondents, 71% were in support of the roundabout concept. Some respondents who expressed support for the concept cited its projected safety benefits for both vehicles and pedestrians as a reason for their support.

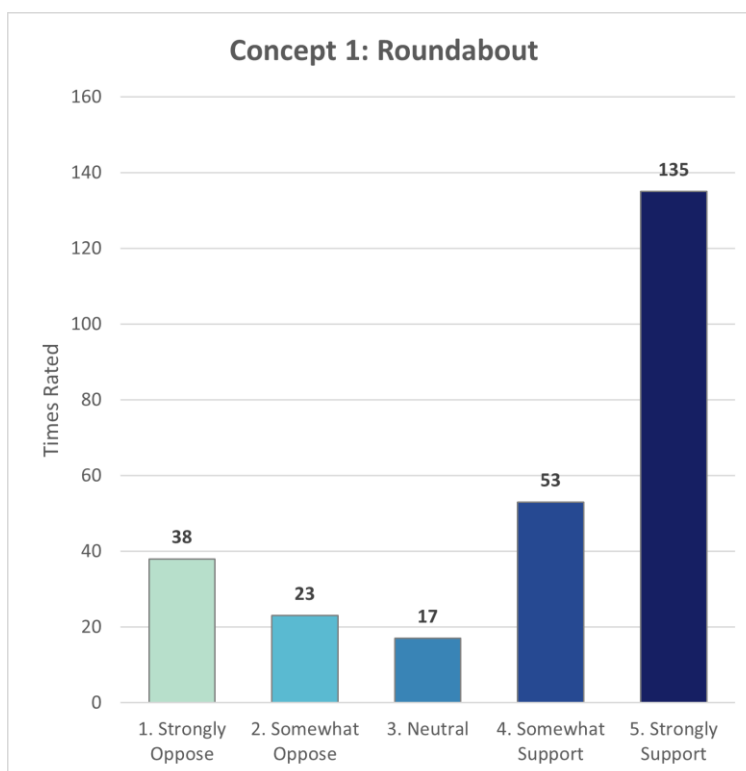


Figure 24: Public Engagement—Roundabout Concept Ranking

Figure 25 summarizes the average ranking for each alternative presented in the survey for the Truslow Road corridor.

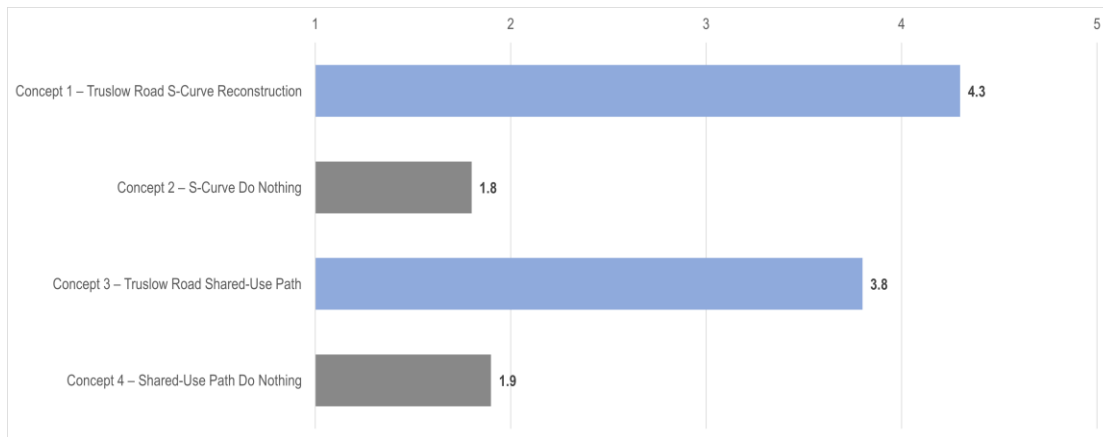


Figure 25: Public Engagement—Average Rating of Alternatives

As shown in **Figure 25**, the public supported the S-curve reconstruction and shared-use path concepts, with respective average ratings of 4.3 and 3.8. **Figure 26** and **Figure 27** summarize the public’s ratings of these concepts. Of 261 respondents, 81% were in support of the S-curve reconstruction concept, and of 252 respondents, 80% were in support of the shared-use path concept. As with the roundabout concept, safety was frequently mentioned by respondents who expressed support for the Truslow Road concepts.

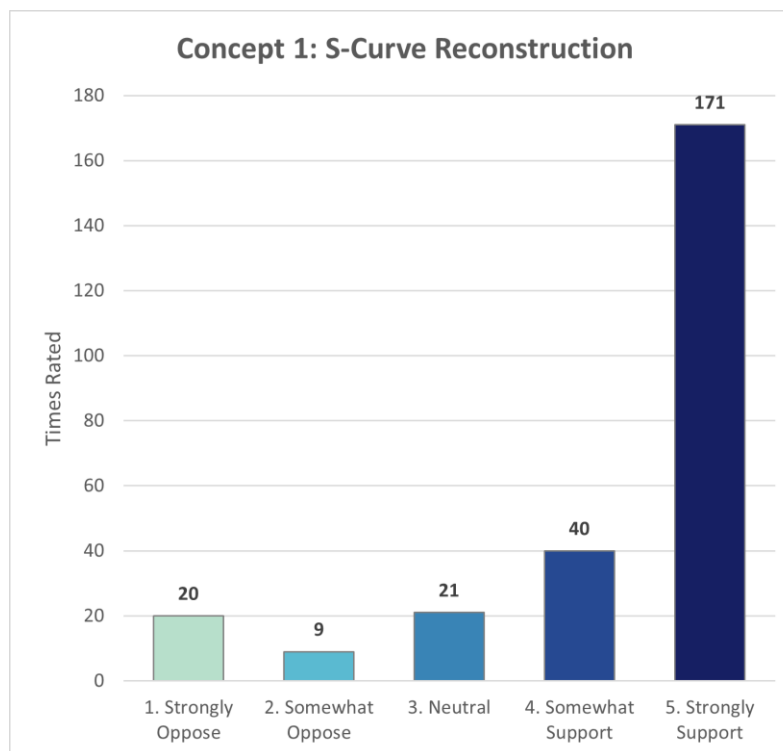


Figure 26: Public Engagement—S-Curve Concept Ranking

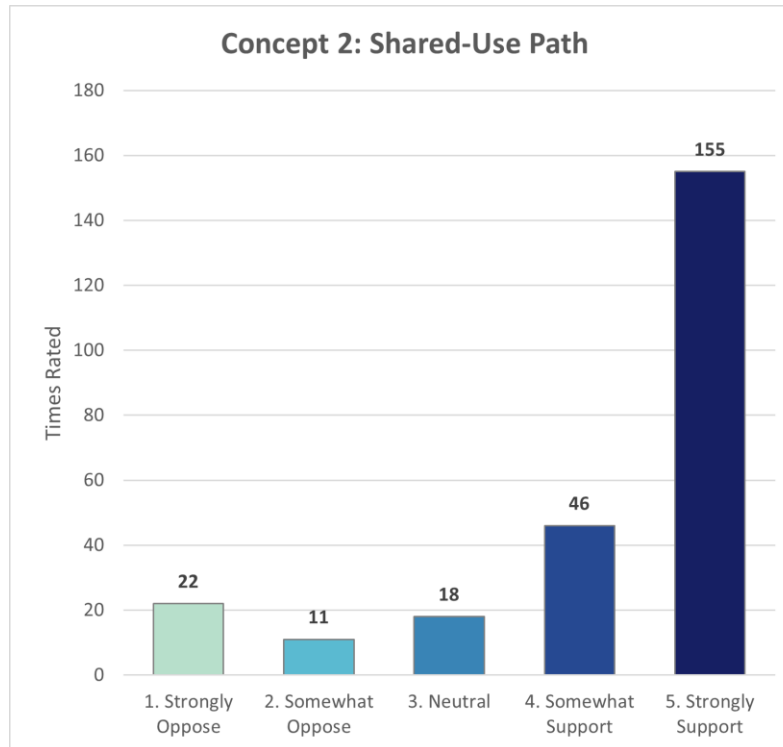


Figure 27: Public Engagement—Shared-Use Path Concept Ranking

The study team incorporated input from the survey to finalize the preferred alternative. Rankings from the public involvement survey were in line with the preferences of the study work group. Detailed survey results are shown in **Appendix E**.

2.5 Preferred Alternative Selection

The Phase 2 Public Engagement Results, Preferred Alternative Selection, and Phase 3 Scoping Meeting (SWG Meeting #5 combined with SWG Meeting #6) was held on December 18, 2025. The purpose of the meeting was to review the Phase 2 public engagement results, share the construction phase cost estimates, select the preferred alternative, and discuss Phase 3 scoping. During this meeting, Kimley-Horn suggested a set of alternatives to advance towards the development of a preferred alternative as outlined in **Chapter 1**: The Project Pipeline Program requires that all recommended improvements be categorized into three distinct groups:

- **Short Term Recommendations (State/Local Forces):** This category consists of immediate maintenance and operational improvements that could be implemented through state/local forces. Examples include vegetation management, HSIP systemic-level safety improvements, adjusting signal timings. Some improvements in this category may also be included in the final-mid-term investment strategy.
- **Mid-Term Investment Strategy (Preferred Alternative):** This category consists of improvements that are targeted for a funding request/application within the next 12 months. Items in this group will advance to Phase 3 of the Project Pipeline study process for further design and cost refinement. All recommendations in the mid-term investment strategy category will be considered the preferred alternative per SMART SCALE High Priority Program (HPP) policy.

- **Long-Term Investment Vision:** This category includes recommendations that represent a long-term investment vision (beyond 20 years). These improvements are not targeted for funding in near or mid-term but are intended to guide localities in their comprehensive planning efforts, inform land development decisions, and reserve and protect future right-of-way. Recommendations in this category will not advance to Phase 3 of Project Pipeline.

After reviewing the survey results and screening-level operations and safety results, and further discussing the concepts, the SWG selected the roundabout at Truslow Road and Stafford Plaza Drive/Summer Breeze Lane and the S-curve reconstruction on Truslow Road as the preferred alternative, as shown in **Figure 28**, as this combination of improvements was determined to best address the identified needs within the study area. Specifically, the preferred alternative:

- Improves safety through reduction of conflict points and realignment of substandard geometry
- Improves traffic operations and reduces delay at the Truslow Road and Stafford Plaza Drive intersection
- Helps supports preservation of arterial function along parallel US 17 by improving the surrounding roadway network
- Provides targeted pedestrian and bicycle connectivity in the vicinity of the proposed improvements
- Minimizes impacts compared to other alternatives considered during screening
- Remains compatible with planned development, including adjacent school and roadway improvements

The preferred alternative also aligns with key SMART SCALE factor areas by improving safety and operations, enhancing multimodal accessibility, and supporting planned development within the study area, consistent with current SMART SCALE evaluation criteria. **Appendix E** includes presentation materials from the Preferred Alternatives meeting and the Phase 2 Preferred Alternative Summary.

Table 18: Preferred Alternative Selection for FR-25-07

Improvement Concept	Short-Term Recommendation	Mid-Term Investment Strategy (Preferred Alternative)	Long-Term Investment Vision
Truslow Road and Summer Breeze Lane/Stafford Plaza Drive Roundabout		✓	
Truslow Road Corridor—S-Curve Realignment		✓	
Truslow Road Corridor—Shared-Use Path (All Segments)			✓

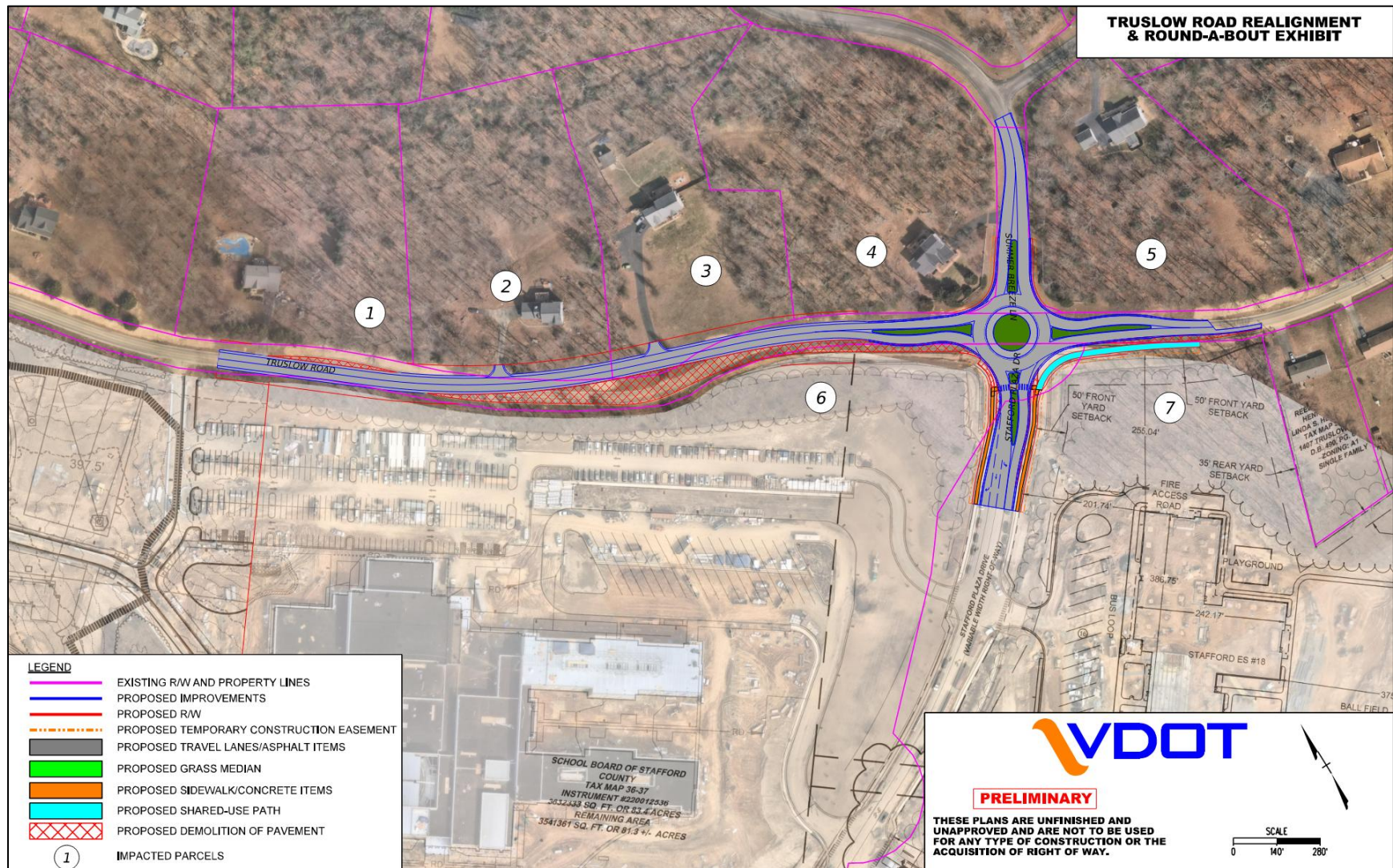


Figure 28: Preferred Alternative—Roundabout and S-Curve Reconstruction

Chapter 3: Preferred Alternative Analysis and Investment Strategy

Phase 3 of the study included a detailed design, cost estimate, risk assessment, and further operations assessment of the selected preferred alternative. While the analysis originally identified “Very High” VTrans needs along the US 17 corridor, including capacity preservation, multimodal access, and transit needs, improvements along US 17 were not advanced as part of this study’s preferred alternative. As it was noted in **Section 1.7.2**, Stafford County is actively advancing a separate US 17 widening study and intends to submit a corresponding project for SMART SCALE Round 7, which is expected to address these corridor-level needs.

As such, this Project Pipeline study focuses on complementary improvements along Truslow Road that support the broader corridor network, improve local safety and operations, and accommodate access to the new Stafford Plaza Drive extension and adjacent school developments. Together, these efforts provide a coordinated approach to addressing both corridor-level and local transportation needs within the study area.

As discussed in **Section 2.5**, the SWG chose the roundabout concept at the intersection of Truslow Road and Stafford Plaza Drive/Summer Breeze Lane and the S-curve reconstruction on Truslow Road as the preferred alternative. While the corridor-wide shared-use path alternative on Truslow Road was not advanced as part of the preferred alternative, the SWG identified an opportunity to incorporate a portion of a shared-use path along the section of Truslow Road being reconstructed as part of the S-curve realignment. This segment supports anticipated pedestrian activity associated with the adjacent school developments and could serve as the foundation for future pedestrian and bicycle accommodations along the corridor. As a result, the preferred alternative concept was refined to include the following components:

- Construct a single lane roundabout with pedestrian crosswalks on all legs
- Realign approximately 1,200 feet of Truslow Road north of Stafford Plaza Extension to remove the S-curve
- Construct a shared-use path along the west side of Truslow Road from Stafford Plaza Extension to the new High School Driveway located approximately 1,300 feet to the north

3.1 Conceptual Sketch and Cost Estimates

Appendix F includes the Basis of Design Memo detailing the established project design criteria, field review notes, risk assessment, and assumptions made during the design effort. **Figure 29** presents the preferred alternative conceptual sketch.

An engineer’s preliminary opinion of probable cost was created for construction costs, right-of-way acquisition costs, and utility relocation costs for the preferred alternative. These cost opinions established the project budget, in FY2026 dollars, as shown in **Table 19**. Supporting documentation for the cost estimate is included in **Appendix F**.

Table 19: FY2026 Preferred Alternative Cost Estimate

Phase Description	Cost Estimate (FY2026)
Preliminary Engineering	\$ 1,917,500
Right of Way and Utility Relocation	\$ 2,698,500
Construction	\$ 8,190,752
Total Project Cost Estimate	\$ 12,806,752

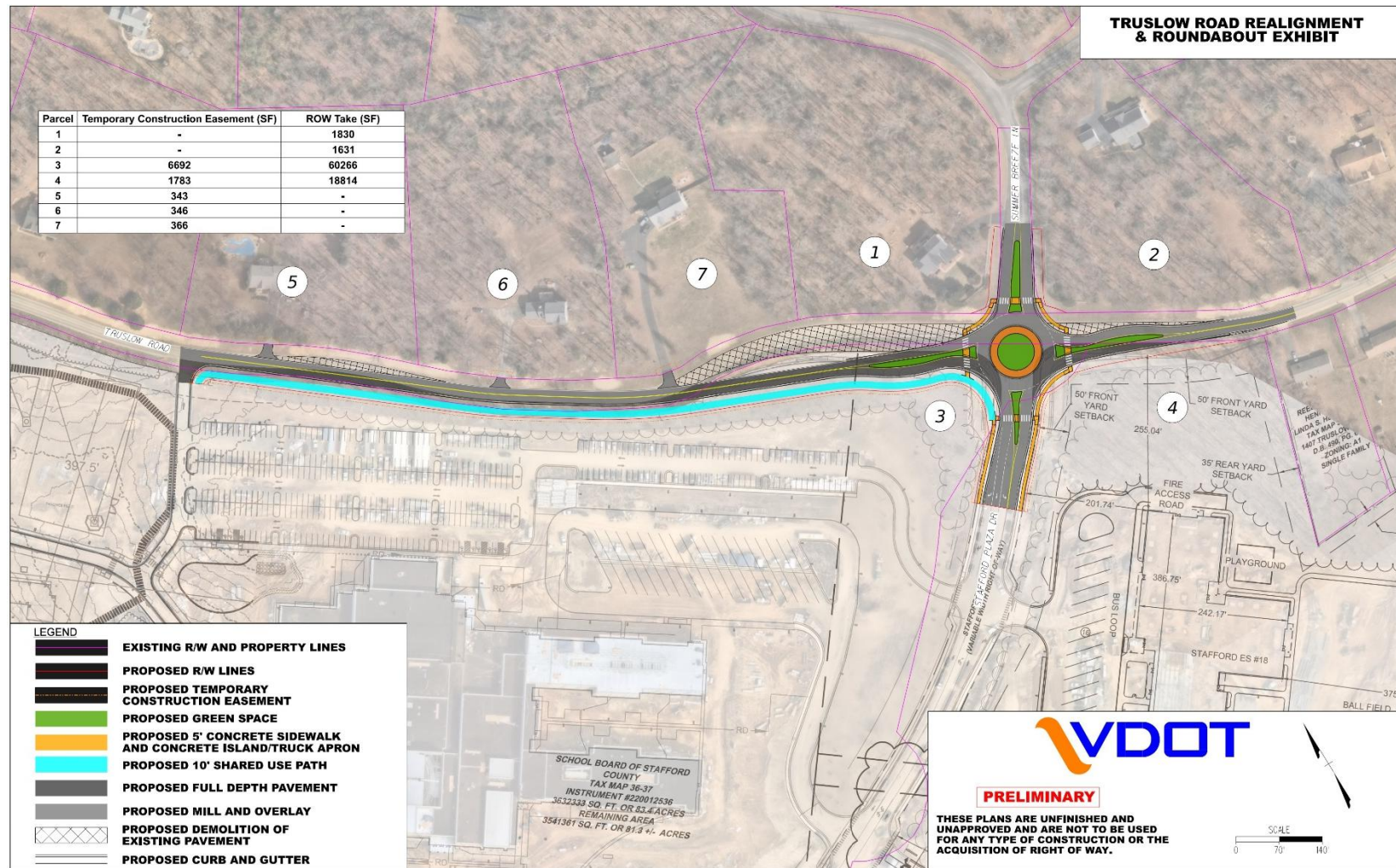


Figure 29: Preferred Alternative Conceptual Sketch

3.2 Schedule Estimates

A schedule estimate was developed for the preferred alternative. **Table 20** summarizes the projected timeframes for preliminary engineering (PE), right of way (RW), and construction (CN) phases.

Table 20: Schedule Estimate

Preferred Alternative (all inclusive)	Estimated Schedule by Phase (months)
Preliminary Engineering	25
Right of Way and Utility Relocation	19
Construction	20
Total	64

3.3 Project Risks

All projects have risks; however, some projects may have more significant risks than others due to technical complexity, funding, financing, and stakeholder acceptance. Risk management generally involves the process of anticipating what risks a project may face, mitigating them to the extent reasonably possible, and having a plan to react to them if and when they occur. This is recognized in VDOT guidance regarding the analysis of and mitigation of risks.

A project risk meeting (SWG Meeting #7) was held on March 18, 2026. The SWG decided to shift the Truslow Road realignment concept from the east to the west, primarily to avoid multiple fiber-optic communications lines that were identified during the field review meeting. This also necessitated shifting the proposed roundabout at Truslow Road and Stafford Plaza Drive Extension towards the west. The concept was also updated to account for logical pedestrian crossing termini and intersection lighting. The preferred alternative was shared on June 6, 2026, during the Concept Refinement Meeting (SWG Meeting #8), which was combined with the Final Concept, Cost, and Risk Meeting (SWG Meeting #9).

The following section lists the most notable potential issues that may affect project development, risks faced by the project, and risk mitigation strategies to be applied to manage and minimize risks throughout project development. **Appendix F** includes the materials from both meetings, risk analysis matrix with details on the risk assessment, and mitigation strategy.

Risk/Issue: Roadway Design

Potential design waivers and design exceptions may be required to accommodate corridor constraints and balance multimodal needs within the available right-of-way. The identification, documentation, and approval of these items during the preliminary engineering (PE) phase may introduce additional coordination with VDOT and could impact project schedule and design development effort. The posted speed limit of 35 mph was used as the proposed design speed. The minimum buffer space is provided where sidewalk and path are provided.

Risk/Issue: Right of Way

Seven parcels will be impacted along Truslow Road for the proposed roundabout and roadway realignments, with the most substantial impacts occurring at adjacent school properties. Temporary construction easements will be required to tie proposed improvements into existing conditions and for three

private entrance connections. GIS data was used as the basis of design and inherent inaccuracies in this data source pose a risk to the areas shown and budget allotted for these impacts. Higher contingencies were used to account for potential SWM areas and inaccuracies with the use of GIS data. Engagement with property owners and Stafford County schools will be performed early during the project PE phase.

Risk/Issue: Environmental

Shifts in roadway alignment bring the facility closer to sensitive land uses, including a nearby high school, which may introduce the need for noise analysis and potential mitigation. In addition, the project lies within the consultation range of the tri-colored bat, and tree clearing or habitat disturbance may require time-of-year (TOY) restrictions. An environmental mitigation analysis, including evaluation of noise impacts and feasible abatement measures, will be conducted during the PE phase and included in the lump sum PE cost.

Risk/Issue: Utilities

Several potential utility conflicts have been identified, including fiber optic and communication infrastructure along the corridor and a 12-inch water line. Field observations indicate clustered fiber lines along one side of Truslow Road and water infrastructure along the opposite side. The roadway alignment has been shifted south to minimize impacts to major utility facilities and reduce potential cost and schedule implications. Additional coordination with utility providers during the PE phase will be required to confirm facility locations, assess relocation needs, and refine mitigation strategies. Higher contingency was used to account for potential utility offsets or relocations.

Risk/Issue: Geotechnical

Areas of unsuitable material have been assumed and remain undefined in the absence of a geotechnical investigation, with the potential for encountering unsuitable soils, rock, or unknown subgrade conditions during design and construction. Existing pavement conditions are also unknown and may require more extensive reconstruction. A geotechnical analysis will be performed during the PE phase to better define subsurface conditions and inform design. The project's cost estimate includes allowances for undercut, geotextile stabilization, and import of suitable materials.

Risk/Issue: Drainage

The condition of the existing storm sewer network is currently unknown, and more detailed stormwater management and conveyance analysis may identify additional impacts or constraints associated with the introduction of curb, gutter, inlets, and stormwater infrastructure. Survey and detailed stormwater management (SWM) analysis will be performed during the PE phase, with the intent to tie into existing SWM facilities near the school properties where feasible. If connection to the existing system is not viable, additional best management practices (BMPs) may be required. Current project cost estimate has contingencies built in that can cover shifting to BMPs if a connection is not possible.

Risk/Issue: Construction

Maintenance of traffic (MOT) during construction will require staging and coordination due to the proximity of adjacent schools, including potential coordination on allowable work hours to maintain safe and efficient operations. Separately, the presence of threatened and endangered species may result in time-of-year restrictions for tree clearing activities, which could limit when certain construction activities can occur. These factors may affect the overall project schedule and will be addressed through MOT planning and construction phasing during the PE phase.

3.4 Possible Funding Sources

Stafford County elected to submit the preferred alternative for SMART SCALE funding, which includes the roundabout at Truslow Road and Stafford Plaza Drive Extension, including the addition of sidewalk throughout the roundabout and shared use path along the school frontage, with the realignment of Truslow Road. **Appendix F** includes the Phase 3 Preferred Alternative Summary.