



PROJECT PIPELINE

ALT US 58 (Cummings Street) from Bradley Street to I-81 Exit 17

**Town of Abingdon, VA
BR-25-01**

**PHASE 3 REPORT
July 2026**

Prepared for



Prepared by



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F	Approved Traffic Forecasting Memorandum
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H	Build Option 1 and Build Option 2 ISATe Output Summaries
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K	Cummings Street Basis of Design Memorandum
L	I-81 Southbound Off-Ramp Basis of Design Memorandum

Chapter 1: Needs Evaluation and Diagnosis

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. Visit the Project Pipeline webpage for additional information: <https://vapipeline.virginia.gov/>.

This study, entitled BR-25-01—ALT US 58 (Cummings Street) between Bradley Street and the I-81 Southbound Ramp (Exit 17), focuses on concepts targeting identified needs including transportation demand management (TDM), bicycle access to activity centers, transit access to activity centers, road safety, pedestrian access to activity centers, and pedestrian safety. The four key steps within the Project Pipeline performance-based planning and programming process are shown in **Figure 1**.

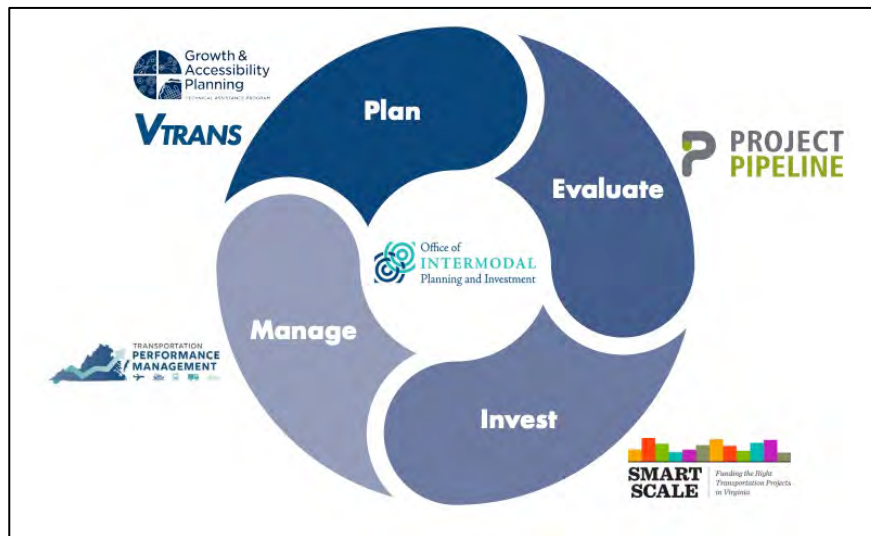


Figure 1: Project Pipeline Key Steps

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.

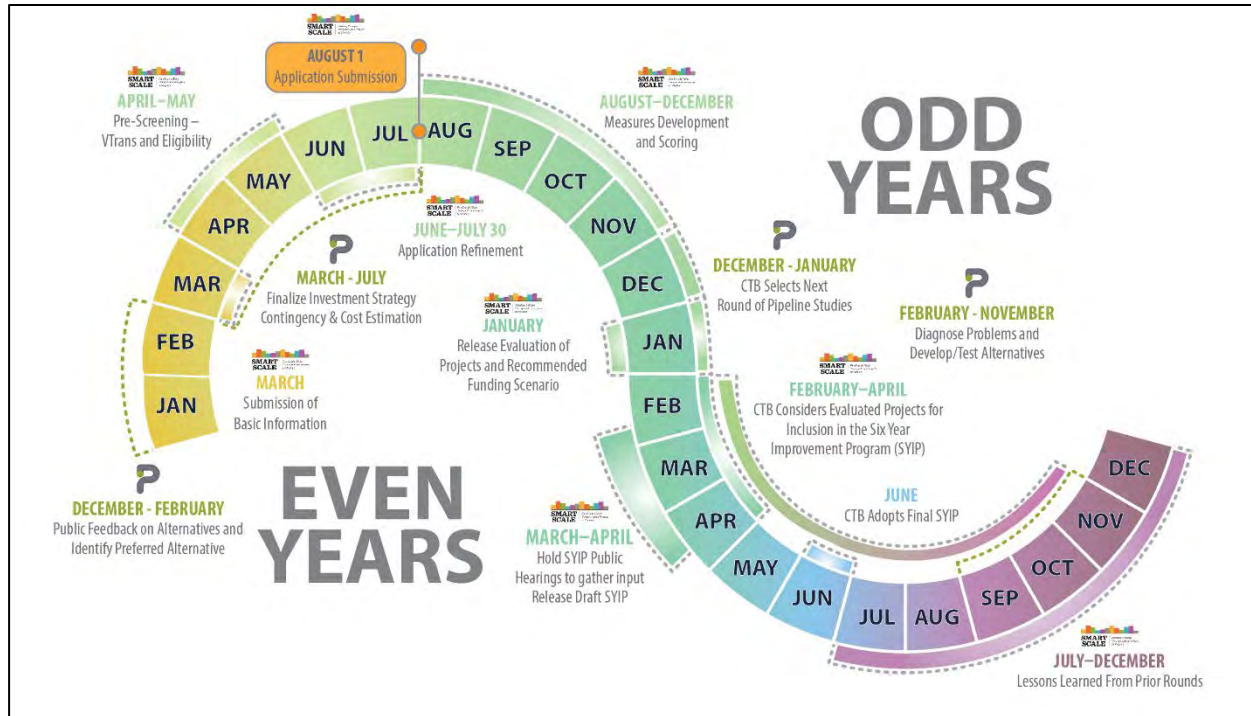


Figure 2: Study Phase Methods and Solutions

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 (OIP), 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)
- Consultant Teams, Central Office Divisions(s), as needed
- 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**.

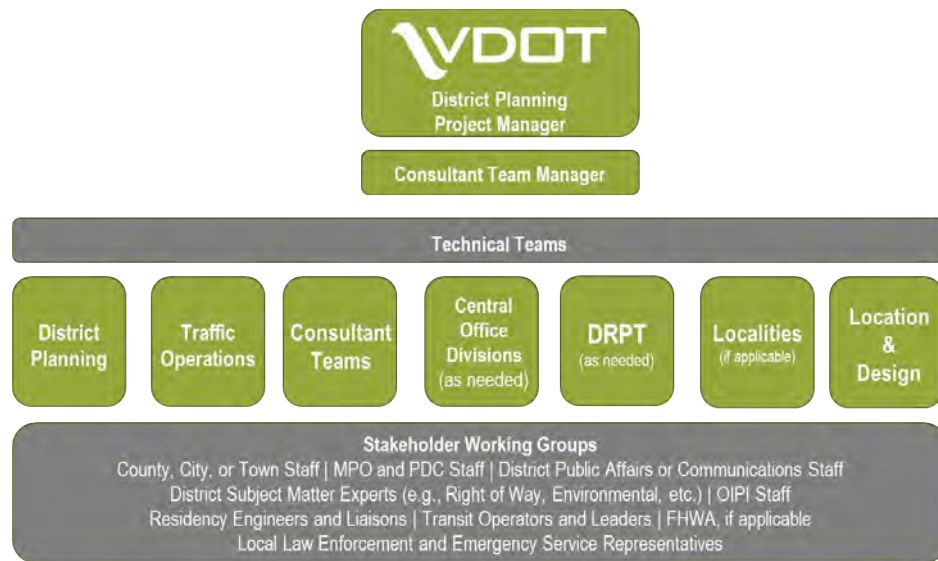


Figure 3: Structure of a Technical Team

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:

- Town of Abingdon
- Bristol Metropolitan Planning Organization (MPO)
- Mount Rogers Planning District Commission (PDC)
- District Three Public Transit (Mountain Lynx)
- Virginia Department of Transportation (VDOT)
- Office of Intermodal Planning and Investment (OIPI)
- Department of Rail and Public Transportation (DRPT)
- VHB

The study area along ALT US 58 (Cummings Street) extends between Bradley Street to the north and the I-81 southbound ramps to the south. ALT US 58 (Cummings Street) is a five-lane undivided roadway classified as an Urban Minor Arterial, with a 35-mph posted speed limit within the study area. The 2023 average annual daily traffic (AADT) from VDOT's traffic data is 15,000 vehicles per day (VPD).

The study area is in the Town of Abingdon in Bristol District adjacent to Exit 17 on I-81. The roadway is part of the South Side Corridor on the Corridors of Statewide Significance (CoSS), and the roadway connects downtown Abingdon to I-81. There are businesses and commercial developments, as well as a park in the vicinity of the study area. There is a residential development on the north end of the study area. The study area is served by two Mountain Lynx Transit bus routes.

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

Table 1: Study Intersections

#	Intersection Name	Control Type
1	ALT US 58 (Cummings Street) at Bradley Street	Unsignalized
2	ALT US 58 (Cummings Street) at Grove Terrace Drive / Wells Fargo Driveway	Unsignalized
3	ALT US 58 (Cummings Street) at Mont Calm	Unsignalized
4	ALT US 58 (Cummings Street) at Abingdon Shopping Center North Driveway	Unsignalized
5	ALT US 58 (Cummings Street) at Abingdon Shopping Center South Driveway	Unsignalized
6	ALT US 58 (Cummings Street) at Fiddler's Driveway	Unsignalized
7	ALT US 58 (Cummings Street) at Cook Street	Signalized
8	ALT US 58 (Cummings Street) at Towne Centre Drive	Unsignalized
9	ALT US 58 (Cummings Street) at Shopping Center Driveway/ McDonald's Driveway	Unsignalized
10	ALT US 58 (Cummings Street) at I-81 Southbound Ramps	Signalized

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

A framework document was developed prior to commencing the study which outlined the study methods and assumptions. The signed framework document is in **Appendix A**. A kickoff meeting with the SWG was held on April 8, 2025, to provide an overview of the study and obtain feedback on the study's assumptions. The kickoff meeting materials are in **Appendix A**.



Figure 4: Project Study Area

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. Priority level is a relative ranking within VTrans need locations (i.e., a "low" priority need is still a need).

Table 2: VTrans Needs Identified in the Study Area

VTrans 2023 Mid-Term Need	Priority
 Safety Improvement	High
 Pedestrian Safety Improvement	Low
 Transportation Demand Management (TDM)	Very High
 Pedestrian Access	Low
 Bicycle Access	Very High
 Transit Access	High

The ALT US 58 (Cummings Street) corridor 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 alternative development
- Conducted detailed existing conditions traffic operational analyses using Synchro and SimTraffic
- Performed a detailed assessment of five-year crash data to identify trends and hot spots
- Assessed existing transit service, multimodal infrastructure, and the suitability for additional transit service within the study area

1.5 High-Level Needs Diagnosis

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, speed data, and census-based demographics 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 has a very high Bicycle Access to Activity Centers need and a low Pedestrian Access to Activity Centers need due to its proximity to downtown Abingdon, Virginia Highlands Community College, Johnston Memorial Hospital, all which VTrans identifies as an “Activity Center.” The bicycle and pedestrian access VTrans needs are identified based on a commuting distance threshold from these activity centers. The study area offers an opportunity for connectivity throughout the study corridor with enhanced pedestrian and bicycle accommodations. There is an existing sidewalk along both sides of ALT US 58 (Cummings Street); however, there are no bicycle facilities directly on the corridor.

The study area has no Congestion Mitigation VTrans needs. This determination was based on the Travel Time Index (TTI) and the proportion of travel taking place during excessively congested conditions. The TTI is a metric comparing average travel time to free flow travel time, serving as a measure of congestion. A TTI of 1.0 means average travel time equals free flow travel time. According to VDOT, a TTI over 1.3 suggests minor congestion, over 1.5 suggests moderate congestion, and over 2.0 indicates severe congestion. The Travel Time Index (TTI) for the corridor is shown in **Figure 5** This data was obtained from a VDOT dashboard. The TTI stays below VDOT’s planning level minor congestion threshold level of 1.3 for the entire day. The TTI peaks between 3:00 PM and 5:00 PM.

The study team conducted a more detailed operations need analysis, documented later in the report.

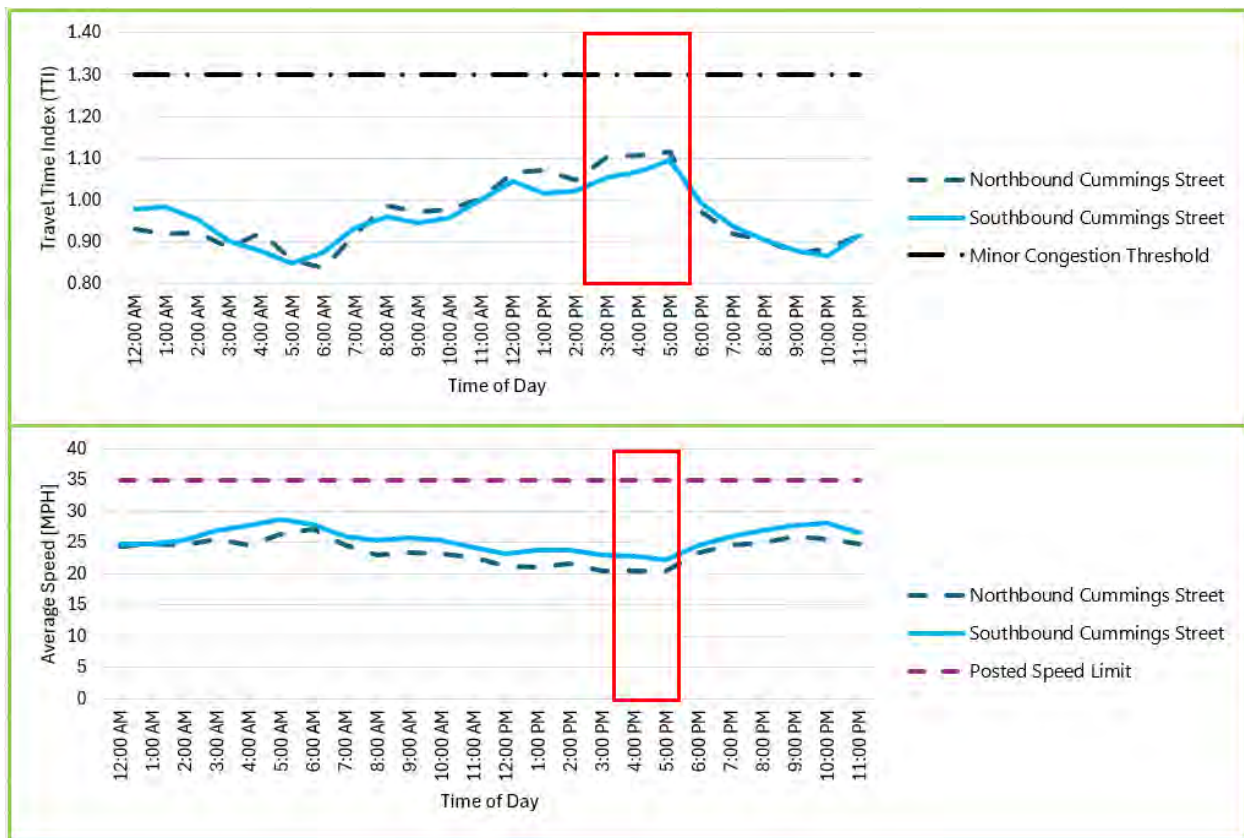


Figure 5: High-Level Operations Needs Summary

The study team used STRAVA data to better understand the pedestrian and bicycle traffic patterns throughout the study corridor. STRAVA is an app for recreational use where people can track their activity; **Figure 6** and **Figure 7** show pedestrian and bicycle heat maps of relative activity levels based on STRAVA data. Pedestrian traffic is more present north of Cook Street, whereas bicycle traffic is more present south of Cook Street and connects to Green Spring Road.

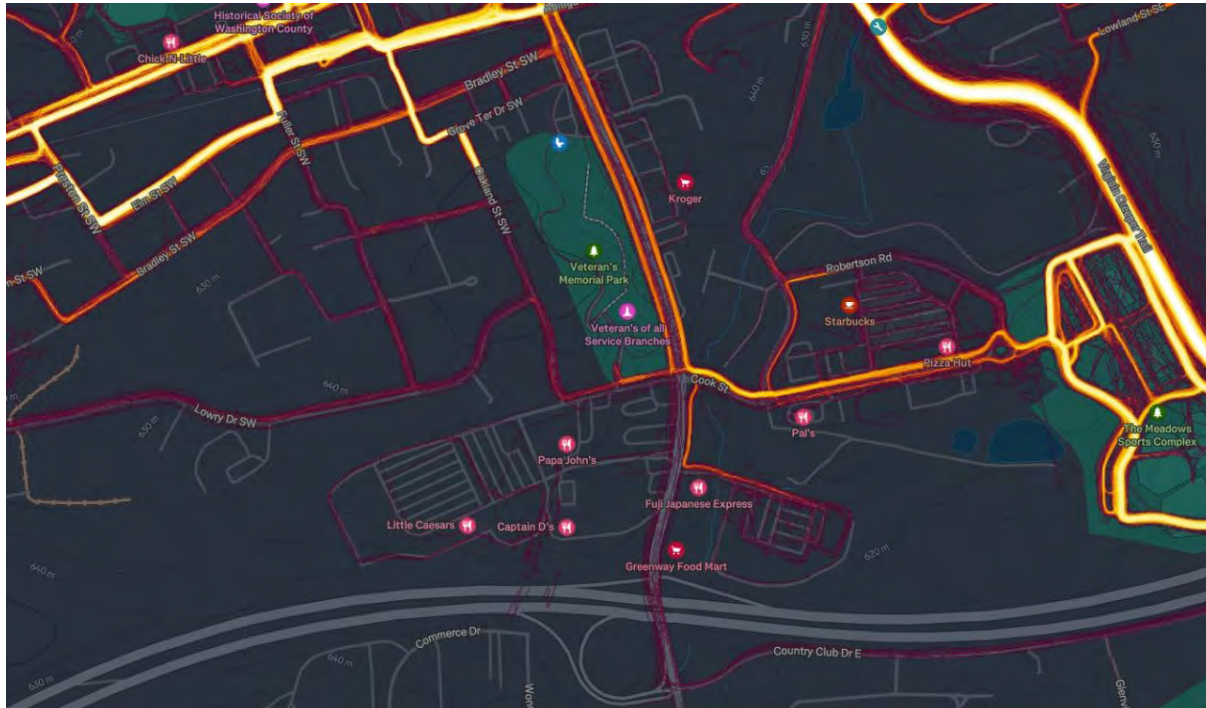


Figure 6: Pedestrian Traffic Heat Map of Relative Activity from STRAVA

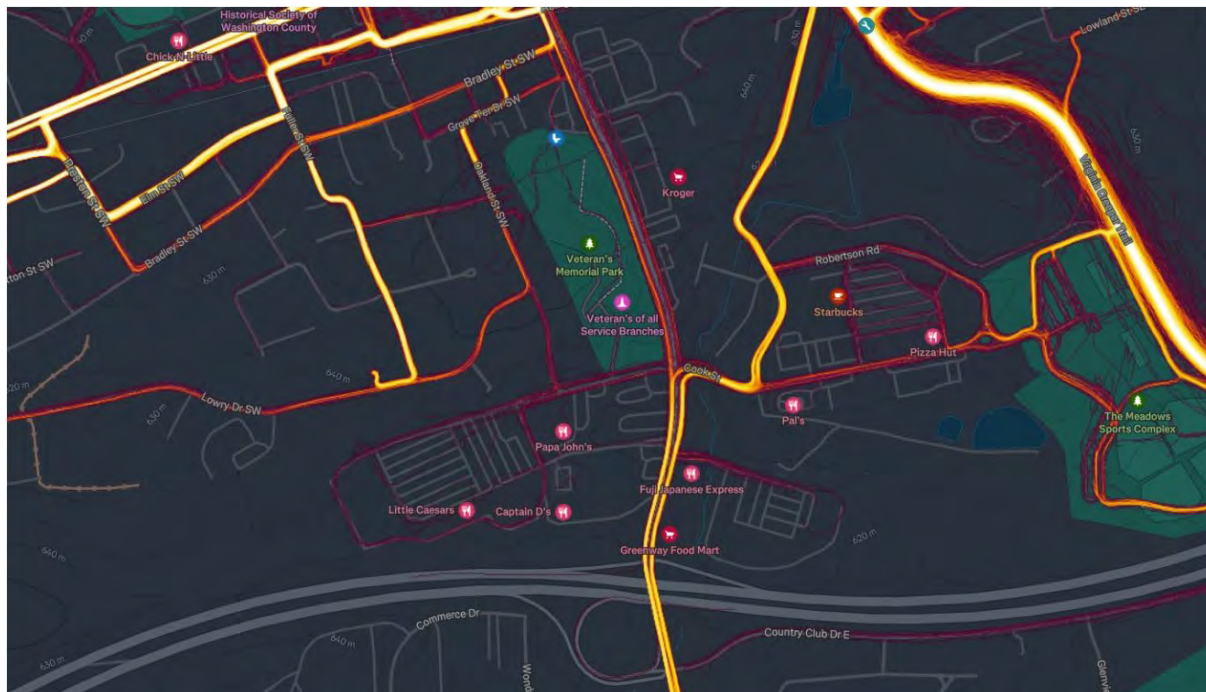


Figure 7: Bike Traffic Heat Map of Relative Activity from STRAVA

Figure 8 shows the very high Bicycle Access VTrans need across the entire ALT US 58 (Cummings Street) corridor.



Figure 8: High-Level Bicycle Access Needs Summary

1.5.2 Safety and Reliability Needs

The study area has high Statewide Safety Improvement and low Pedestrian Safety Improvement VTrans needs. ALT US 58 (Cummings Street) is a VDOT Pedestrian Bicycle Safety Action Plan v4.0 (PBSAP) statewide top 5% priority corridor, meaning that there are systemic risk factors (e.g., number of lanes, speed limit, land use, demographics, crash data) indicating high pedestrian/bicycle crash risk. The study corridor has existing sidewalks on both sides throughout the whole corridor, limited pedestrian crossings at Cook Street and Bradley Street, and no existing bike lanes or bike facilities.

Specifically, the segment of ALT US 58 (Cummings Street) north of Grove Terrace Drive / Wells Fargo Driveway has a low Statewide Safety Improvement VTrans need and the segment of ALT US 58 (Cummings Street) south of Grove Terrace Drive / Wells Fargo Driveway has a high Statewide Safety Improvement VTrans need. This is shown in **Figure 9**.

The study team reviewed the VDOT crash data from 2020-2024 to identify high-level crash trends in the study corridor. In total, 135 crashes were reported in the study area, including one serious injury, 69 total injury crashes, and 66 crashes involving property damage only (PDO). Most crashes in the study area were either angle (49%), rear-end (23%), or sideswipe (18%) crashes. There were no bicycle or pedestrian related crashes within the five-year study period.

Figure 10 displays a heat (density) map of all crashes on the corridor for the 2020-2024 study period and distinguishes the collision types and severity. A high density of crashes was identified at ALT US 58 (Cummings Street) / Cook Street and at ALT US 58 (Cummings Street) at Shopping Center Driveway/ McDonald's Driveway.



Figure 9: High-Level Road Safety Needs Summary



Figure 10: Crash Density by Severity and Collision Type (2020-2024)

All intersection and roadway segments within the VDOT linear referencing system (LRS) are evaluated by VDOT annually for the potential for safety improvement (PSI) based on *Highway Safety Manual (HSM)* methodology. PSI is a statistical comparison between predicted crashes and crash experience, with an overrepresentation of crash experience indicating a potential for safety improvement. Crash frequency,

severity of crashes, volume, and length of segment are contributing factors in the predictive analysis. The top 100 PSI intersections and 100 miles of PSI segments are published by VDOT for each district on an annual basis. VDOT also identifies Targeted Safety Need (TSN) locations, which are intersections or segments that have been identified as PSI locations for three or more of the last five years. PSI ranked intersections and segments for ALT US 58 (Cummings Street) are identified in **Figure 11**.

The ALT US 58 (Cummings Street) corridor accounts for three of the highest PSI ranked intersections (3, 26, and 86) in the Bristol District. The Cook Street and ALT US 58 (Cummings Street) intersection was the third highest ranking in the district. The study corridor also contains three of the highest PSI ranked segments (2, 19, and 34) in the Bristol District. The segment between the Wendy's entrance driveway and the I-81 southbound ramps was ranked second in the district.



Figure 11: PSI Intersections & Segments

1.5.3 Transit and Transportation Demand Management Needs

The study area has a high Transit Access VTrans need and a very high Transportation Demand Management (TDM) VTrans need across the ALT US 58 (Cummings Street) corridor. The transit access VTrans need was identified based on a statewide analysis indicating that fewer workers are able to reach a VTrans activity center within 45 minutes by transit than by private automobile. The TDM VTrans need is automatically assigned to non-limited access facilities that are on the Corridors of Statewide Significance (CoSS), such as ALT US 58 (Cummings Street). This assignment is indicative of the importance of these statewide transportation arteries to moving people and goods. The goal of TDM in general is to convert private automobile trips to carpools or multimodal (e.g., transit, walk, bike). These VTrans needs informed

the development of potential Transportation Demand Management (TDM) strategies. These needs can be seen in **Figure 12** and **Figure 13**.



Figure 12: High-Level Transit Access Needs Summary



Figure 13: High-Level Transportation Demand Management (TDM) Needs Summary

The study team reviewed the existing Mountain Lynx Transit bus service in the study area. There are two bus routes that service the study area, the Blue Loop and the Silver Loop, as shown in **Figure 14**. Buses

operate Monday to Friday from 8:00 AM to 5:00 PM along the fixed route but can also deviate for a requested pick-up or drop-off.

TDM options within or near the study area include commuter and rideshare services through Mountain Lynx with request-based service on Mondays through Fridays between 7:30 AM and 4:30 PM, and standard Transportation Network Companies (TNC) availability (e.g., Uber, Lyft). There are two Park-and-Ride lots in Abingdon, the nearest one to the study area is located to the west adjacent to Exit 14 on I-81, and there is another one adjacent to the intersection of Porterfield Highway and Russell Road.

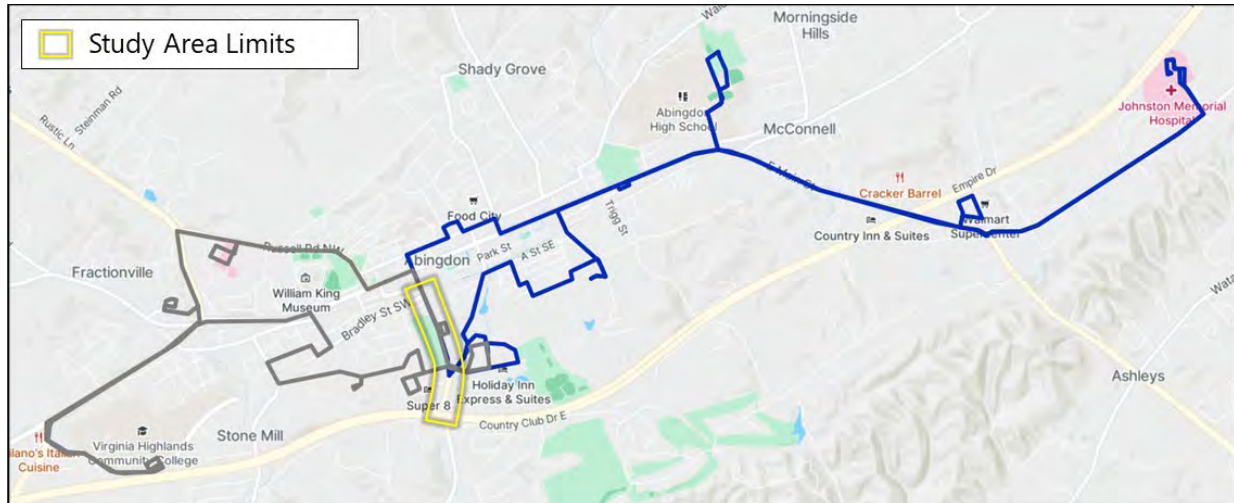


Figure 14: Existing Mountain Lynx Transit Routes in Abingdon

1.5.4 Environmental Considerations

The Virginia Department of Environmental Quality (DEQ) EJScreen+ tool is an enhanced environmental justice screening and mapping tool. It is designed to support state-level decision-making by integrating various data sets to identify and address environmental justice issues. EJScreen+ offers detailed information on environmental and demographic indicators, helping to pinpoint areas with potential environmental risks and vulnerable communities. This tool helps to ensure that environmental actions and policies are equitable and effectively benefit all residents, particularly those disproportionately affected by environmental hazards.

An equity analysis report for the study area was generated by navigating to the study area and reviewing adjacent census block groups and tracts. VDOT Bristol District Environmental Division also offered input on the study area. The high-level desktop review of existing environmental conditions within the study area is summarized in **Table 3**.

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.	Environmental Justice (EJ) Screen: Low Income Communities - 30% or more of the Population Under HUD 80% AMI and Under Two Times Federal Poverty Level (2011-2018 ACS), Communities of Color – Over Statewide Average (37.8%) (2014-2018 ACS)	Within the study area, there are low-income communities ranging from 52% to 61% under HUD, 80% AMI, and 36% to 72% below two times the federal poverty level.
Recreational Facilities	Places available for recreational or communal use, such as a YMCA or community parks.	VDOT Environmental Review Virginia Department of Conservation Recreation (VDCR) Natural Heritage Data Explorer (NHDE) VDCR Virginia Outdoor Plan Mapper Aerial Imagery	The Abingdon Market Pavillion exists at the northern terminus of the study area and the Veterans Memorial Park is located at the northwest quadrant of the ALT US 58 (Cummings Street) at Cook Street intersection. The Meadows Sports Complex is located east of the study area on Cook Street.
Community Services	Places available to the public such as hospitals, schools, and churches.	Aerial Imagery Virginia Geographic Information Network (VGIN)	There were no community services identified within the study area.
Bike/Pedestrian Facilities	Existing sidewalks, bike paths, and trails.	Aerial Imagery	There are sidewalks on both sides of ALT US 58 (Cummings Streets) and Cook Street. The

Environmental Resource	Description	Source	Existing Resources in Study Area
		VDCR Virginia Outdoor Plan Mapper	Creeper Trail is located within a mile of the study corridor.
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	There were no Section 6(f) sites identified 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.	VDOT Bristol District Environmental Review Virginia Department of Historic Resources (VDHR) Virginia Cultural Resource Information System (V-CRIS) National Register of Historic Places (NRHP)	The Hassinger House (The Grove/now Abingdon Olive Oil Co.), lies at the intersection of ALT US 58 (Cummings Street) and Grove Terrace Drive, and was determined to be potentially eligible for the NRHP. VDOT Bristol District Environmental Division recommends avoiding impacts to this parcel.
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.	VDOT Bristol District Environmental Review VDCR NHDE VDCR Virginia Outdoor Plan Mapper VDHR V-CRIS	The Veterans Memorial Park is owned and operated by the Town of Abingdon. Any impact to the property would require coordination with the Town and FHWA. VDOT Bristol District Environmental Division recommends avoiding impacts to this parcel.

Environmental Resource	Description	Source	Existing Resources in Study Area
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 Bat Consultation Tool Northern Long-Eared Bat [NLEB], Tri-Colored Bat, and Little Brown Bat Center for Conservation Biology (CCB) Eagle Nest Locator	<u>USFWS</u> <u>USFWS IPaC</u> – The Gray Bat, Indiana Bat, Virginia Big-eared Bat, and Finerayed Pigtoe Clam are endangered species within the study area. <u>VDWR Databases</u> <u>VDWR</u>- There are consultation ranges for the NLEB, Tri-Colored Bat, or Little Brown Bat within the study area. <u>CCB</u>- No eagle nests were identified in 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 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. Town Creek runs through the study area to the east of Cummings Street.
Hazardous Materials	Any documented spills, releases, or history of contamination on	VDOT Bristol District Environmental Review	Numerous petroleum release sites are documented within and adjacent to the corridor, especially between I-81 and Cook St. Historic

Environmental Resource	Description	Source	Existing Resources in Study Area
	surrounding sites that may be impacted by the proposed project.	Virginia Department of Environmental Quality (DEQ) Environmental Data Mapper	hazardous materials sites are also assumed to be present. VDOT Bristol District Environmental Division recommends ASTM Phase I Environmental Site Assessment along the entire corridor, and that design should avoid construction, especially excavation, in the vicinity of documented hazardous materials sites.
Open Space, Conservation 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 defined as such in the zoning map.	VDCR NHDE VDCR Outdoors Plan Mapper The Virginia Outdoor Foundation The Nature Conservancy	No protected lands were identified within the study area.
Farmland	Lands with soil 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	The entire study area is within a census-designated urban area.
Noise	Determining whether the subject project may be considered a Type I project based on VDOT and FHWA guidance.	VDOT Bristol District Environmental Review VDOT and FHWA Noise Guidance	A noise study will likely be required if capacity is added to the roadway, such as adding auxiliary lanes, the addition or extension of turn lanes, and the extension of acceleration and deceleration lanes, any minor intersection improvements or reconfigurations, and any interchange ramp

Environmental Resource	Description	Source	Existing Resources in Study Area
			extensions or modifications. Noise abatement is not anticipated.
Land Use	Land Area that has been given specific use based on local jurisdiction land use designations.	Washington County GIS Data	The study area primarily consists of commercial land uses.
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.
Tree Clearing Time of Year Restriction	Identify if a restriction on tree clearing is restricted to certain times of the year.	VDOT Bristol District Environmental	A tree clearing time of year restriction will be required from April 1 – Nov 15 to protect bat habitat. If culverts are impacted and evidence of migratory bird nests or bats are found in the culvert, a second TOYR may be required depending on what species of bat/bird is found

**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.*

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 will be 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 SimTraffic, and reviewing pedestrian, bicycle, and transit activity. Preliminary Synchro results of the existing conditions analysis and preliminary brainstorming for what concepts need to address were presented to the Study Work Group on July 2, 2025. The presentation is provided for reference below.¹

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:

- Cook Street Extension
 - Extend Cook Street westward from ALT US 58 (Cummings Street) to connect to Stone Mill Road
 - Two lane undivided roadway with a five-foot sidewalk on the south side
- French Moore Boulevard Extension
 - Extend French Moore Boulevard eastward from existing terminus to Stone Mill Road
 - Two lane undivided roadway with a five-foot sidewalk on the south side
- VHSIP Improvements
 - High-visibility signal backplates (HVSB) at the intersection of ALT US 58 (Cummings Street) at I-81 Southbound Ramps
 - Curve warning signs on ALT US 58 (Cummings Street) south of I-81 and on Green Spring Road S-curve
- US 11 (Main Street) at ALT US 58 (Cummings Street) and Remsburg Drive at Cummings Street
 - SMART SCALE application from Project Pipeline Round 2 study of US 11 (Main Street)
 - Application scored well in SMART SCALE and was initially recommended for funding; however, local stakeholders were in consensus to shift funding to the French Moore Boulevard Extension project
 - Local interest in resubmitting to SMART SCALE in future funding round

¹ Existing Conditions Study Work Group Presentation:
<https://app.mural.co/t/vhbipd8103/m/vhbipd8103/1749480213508/7fa5b3f286d7738c62244bb0808f5da1c128f23f>

- US 11 (Main Street) Corridor Improvements
 - Bristol MPO SMART SCALE application from Project Pipeline Round 2 study of US 11 (Main Street)
 - Application scored well in SMART SCALE Round 6 and was initially the top scoring application in Bristol District not to get funding
 - Local interest in resubmitting to SMART SCALE in future funding round

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, 135 crashes were reported in the study area, including one serious injury. Summaries of crashes in the study area by intersection, severity, and collision type are shown in **Table 4** and **Table 5**, respectively.

Crash severity is coded using the KABCO scale, which is defined using the following classifications:

- K—Fatal Injury
- A—Severe Injury
- B—Minor Injury
- C—Nonvisible Injury
- PDO—Property Damage Only

Table 4: Study Area Crashes by Intersection and Crash Severity

Intersection	# of Crashes—A	# of Crashes—B	# of Crashes—C	# of Crashes—PDO	Total
ALT US 58 (Cummings Street) at Bradley Street	0	0	1	2	3
ALT US 58 (Cummings Street) at Grove Terrace Drive / Wells Fargo Driveway	0	1	1	0	2
ALT US 58 (Cummings Street) at Mont Calm	0	0	0	1	1
ALT US 58 (Cummings Street) at Abingdon Shopping Center North Driveway	0	1	5	1	7
ALT US 58 (Cummings Street) at Abingdon Shopping Center South Driveway	1	0	0	1	2
ALT US 58 (Cummings Street) at Fiddler's Driveway	0	1	2	3	6
ALT US 58 (Cummings Street) at Cook Street	0	9	18	24	51
ALT US 58 (Cummings Street) at Towne Centre Drive	0	2	0	3	5
ALT US 58 (Cummings Street) at Shopping Center Driveway/ McDonald's Driveway	0	5	10	11	26
ALT US 58 (Cummings Street) at I-81 Southbound Ramps	0	0	3	4	7
Rest of Corridor	0	3	6	16	25
Total	1 (1%)	22 (16%)	46 (34%)	66 (49%)	135

Table 5: Study Area Crashes by Intersection and Collision Type

Intersection	# of Crashes – Angle	# of Crashes – Rear End	# of Crashes – Head-On	# of Crashes – Fixed Object	# of Crashes – Side-swipe	# of Crashes – Other	# of Crashes – Total
ALT US 58 (Cummings Street) at Bradley Street	0	1	0	0	1	1	3
ALT US 58 (Cummings Street) at Grove Terrace Drive / Wells Fargo Driveway	2	0	0	0	0	0	2
ALT US 58 (Cummings Street) at Mont Calm	0	0	0	1	0	0	1
ALT US 58 (Cummings Street) at Abingdon Shopping Center North Driveway	5	1	0	0	1	0	7
ALT US 58 (Cummings Street) at Abingdon Shopping Center South Driveway	2	0	0	0	0	0	2
ALT US 58 (Cummings Street) at Fiddler's Driveway	3	1	0	0	1	1	6
ALT US 58 (Cummings Street) at Cook Street	23	12	2	1	10	3	51
ALT US 58 (Cummings Street) at Towne Centre Drive	3	1	0	0	0	1	5
ALT US 58 (Cummings Street) at Shopping Center Driveway/ McDonald's Driveway	16	2	0	0	7	1	26
ALT US 58 (Cummings Street) at I-81 Southbound Ramps	2	4	0	0	1	0	7
Rest of Corridor	10	9	0	0	3	3	25
Total	66 (49%)	31 (23%)	2 (1%)	2 (1%)	24 (18%)	10 (7%)	135

FR300 reports and VDOT crash data were used to create collision diagrams for the corridor and identify the following crash hot spots.

The study team identified the intersection of ALT US 58 (Cummings Street) at Cook Street as a crash hot spot with 51 crashes. 45% of those crashes were angle collisions, 33% were in the westbound direction, and 16% were red light running crashes. 18% of the crashes resulted in a minor injury. The mainline ALT US 58 (Cummings Street) left turn signal heads at the intersection were upgraded from doghouse signals to flashing yellow arrow signals in late 2022. Collision diagrams for the Cook Street intersection can be referenced in **Figure 18**, **Figure 19**, and **Figure 20**.

The ALT US 58 (Cummings Street) at Shopping Center Driveway / McDonald's Driveway intersection was also identified as a crash hot spot with 26 crashes. 62% of the crashes were angle collisions, where 11 of those were due to a northbound left into the McDonald's entrance. 19% of the crashes resulted in a minor injury. This can be referenced in **Figure 22**.

All other study intersections along the corridor (**Figure 15**, **Figure 16**, **Figure 17**, **Figure 21**, **Figure 23**, **Figure 24**) were not identified by the study team as crash hot spots.

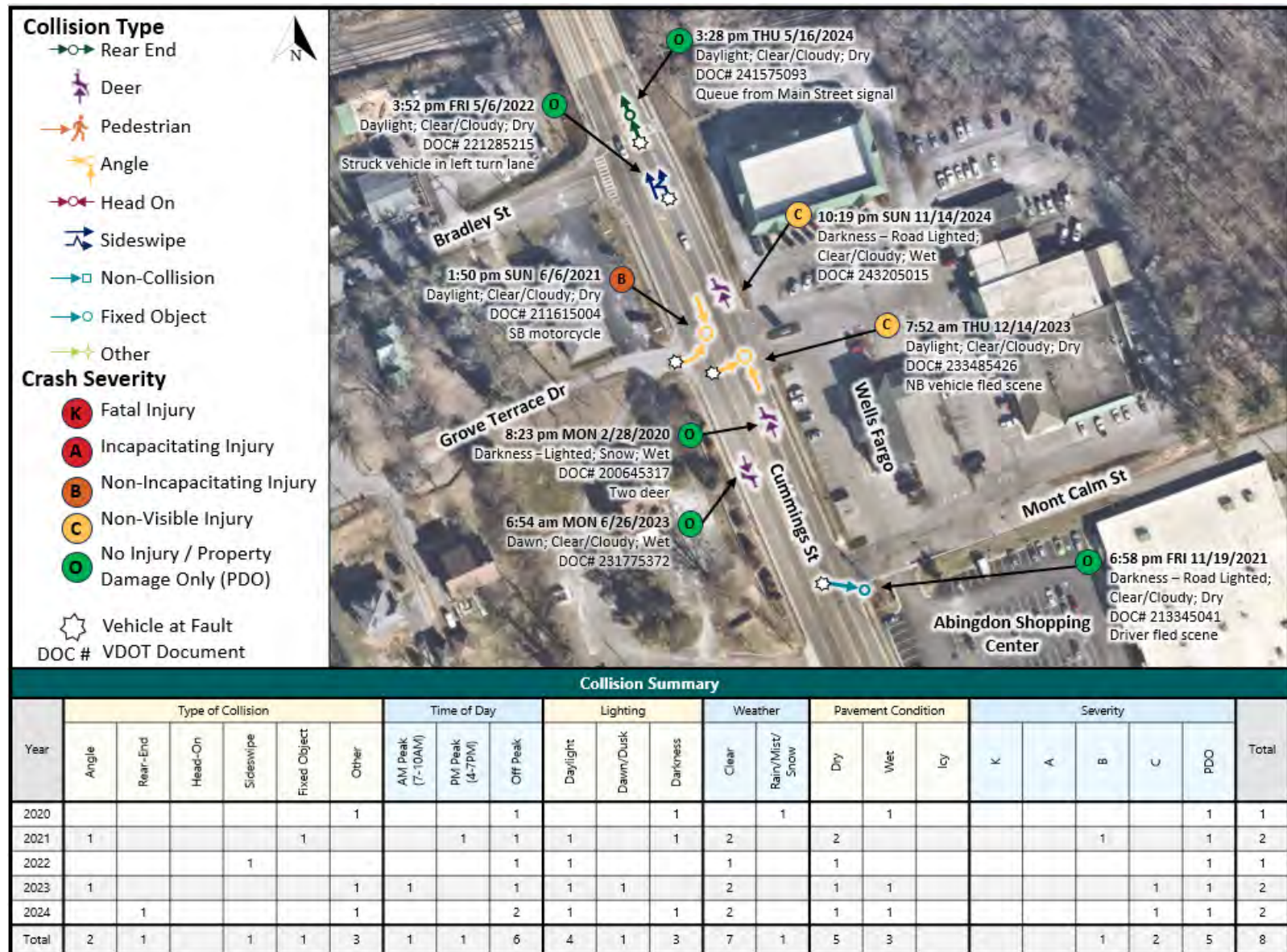


Figure 15: ALT US 58 (Cummings Street) at Grove Terrace Drive Intersection Collision Diagram

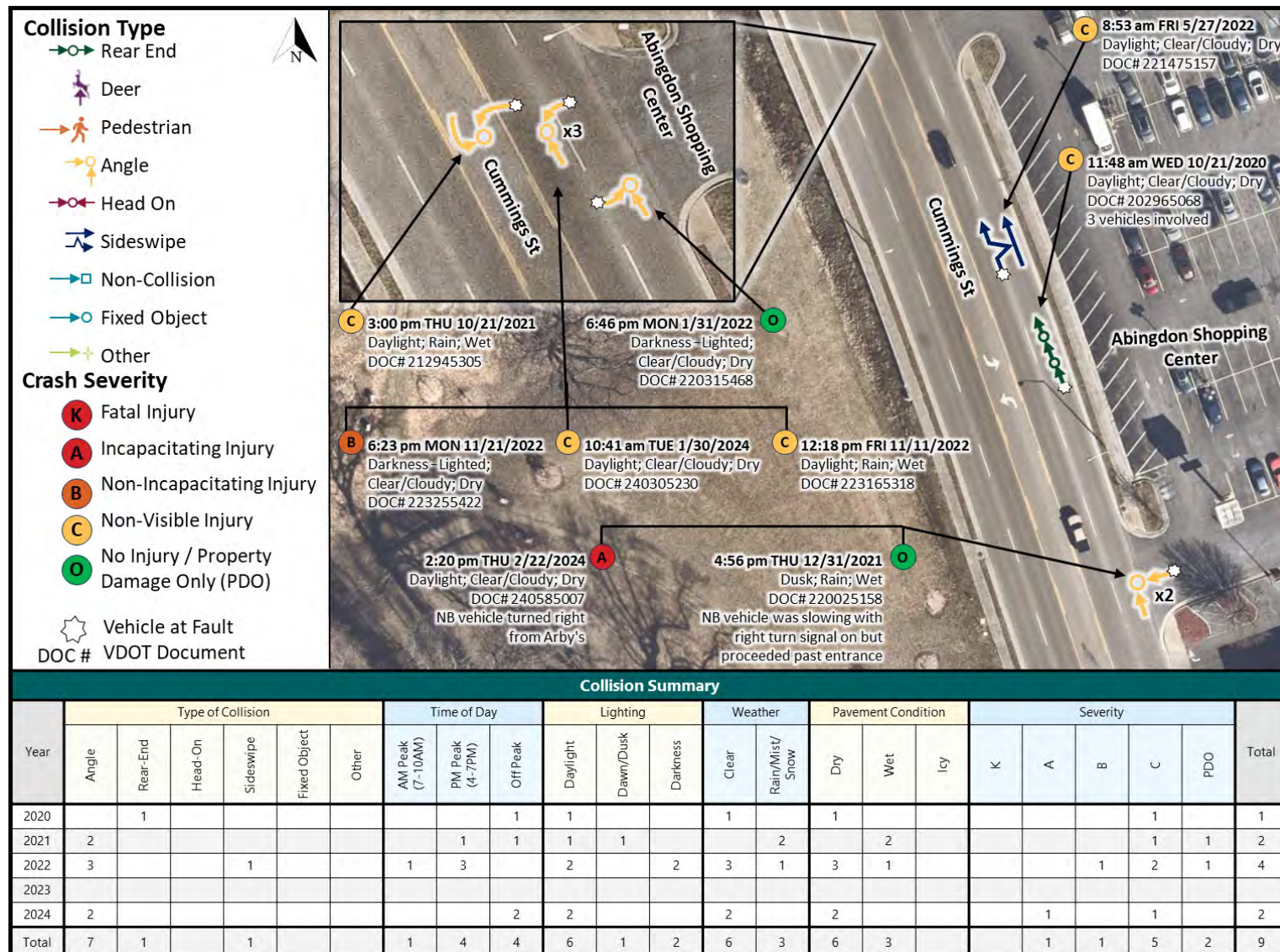


Figure 16: ALT US 58 (Cummings Street) at Abingdon Shopping Center Intersection Collision Diagram

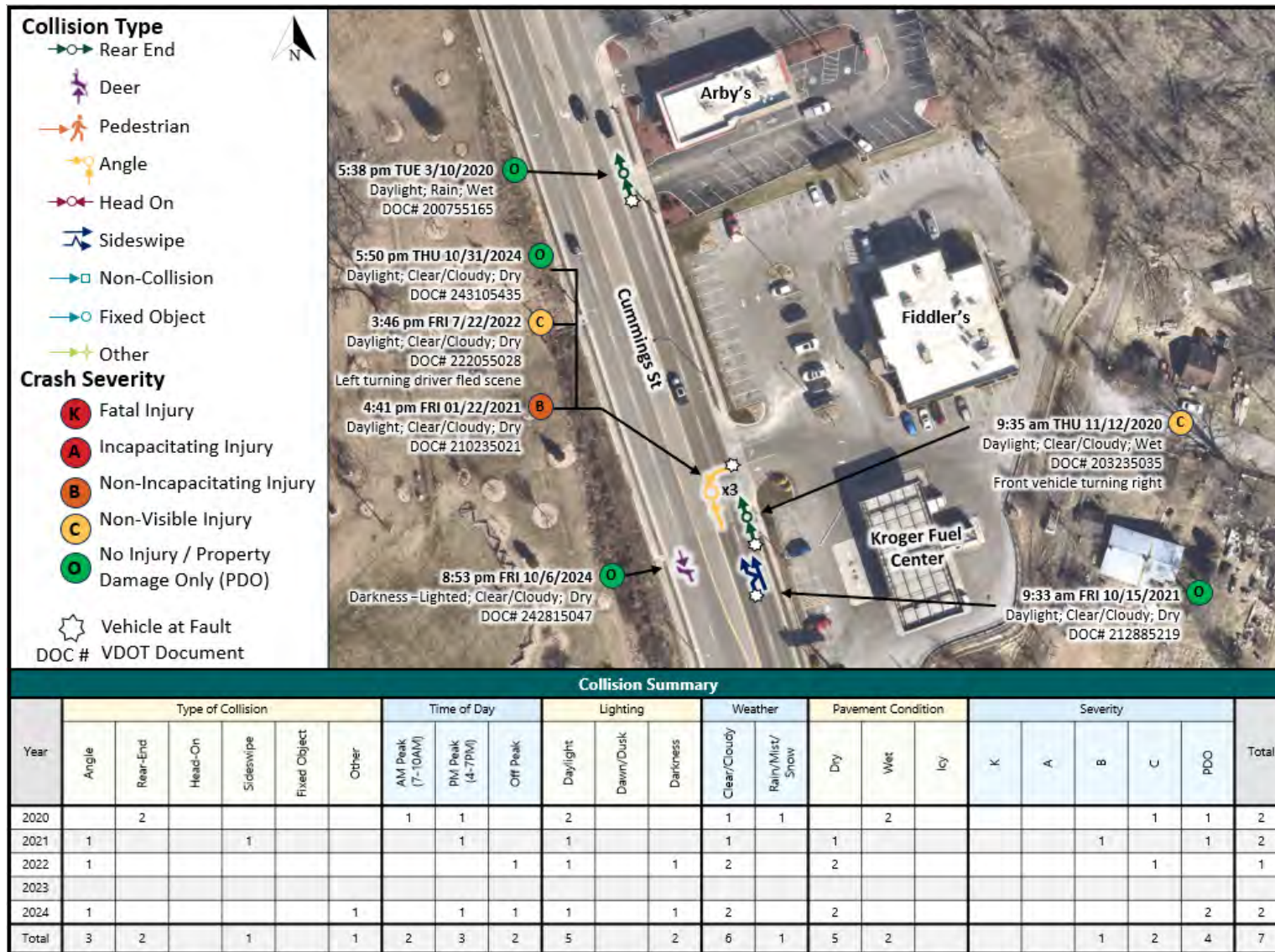


Figure 17: ALT US 58 (Cummings Street) at Kroger Fuel Center/Fiddler's Intersection Collision Diagram

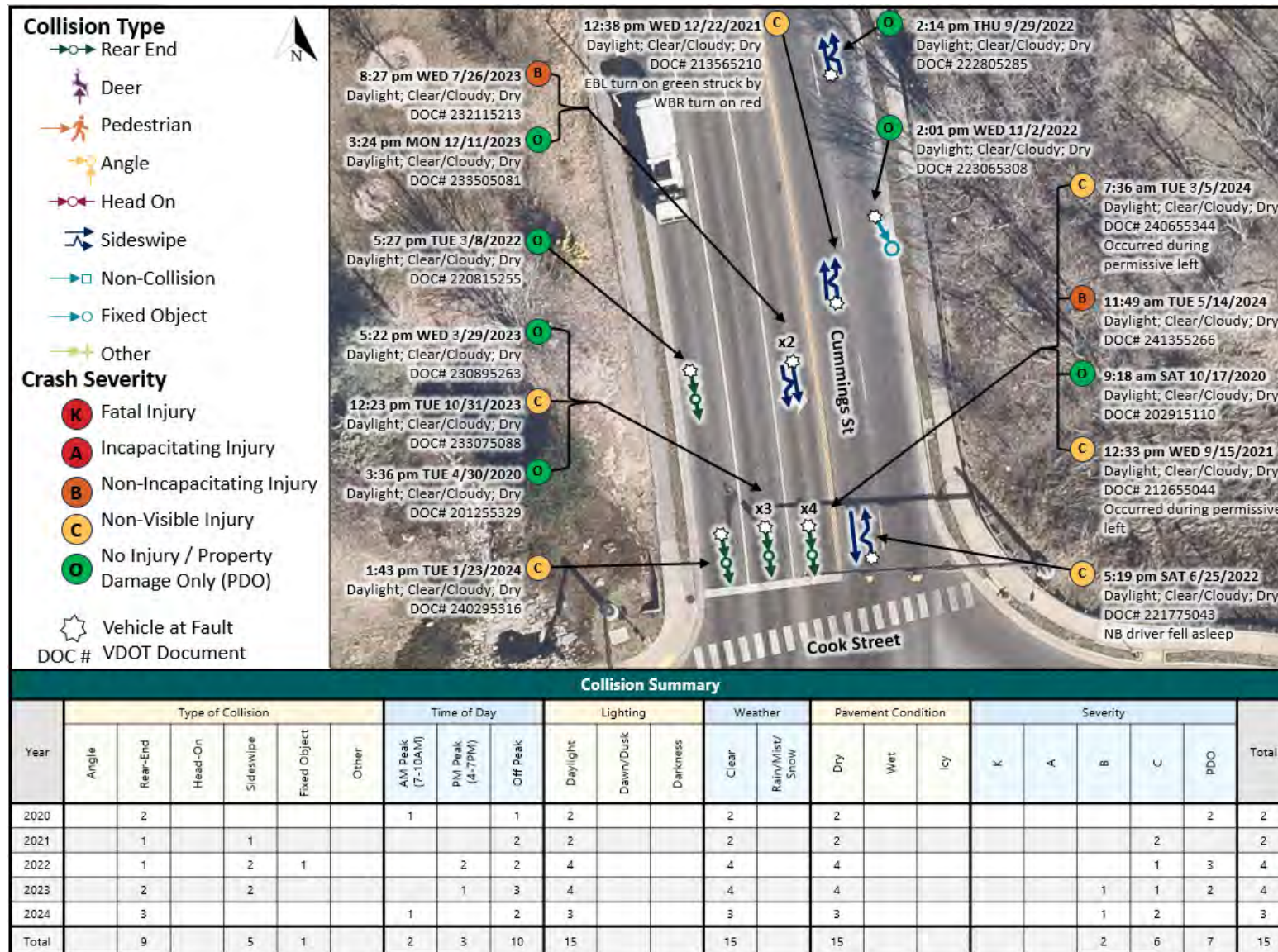


Figure 18: North Leg of ALT US 58 (Cummings Street) at Cook Street Intersection Collision Diagram

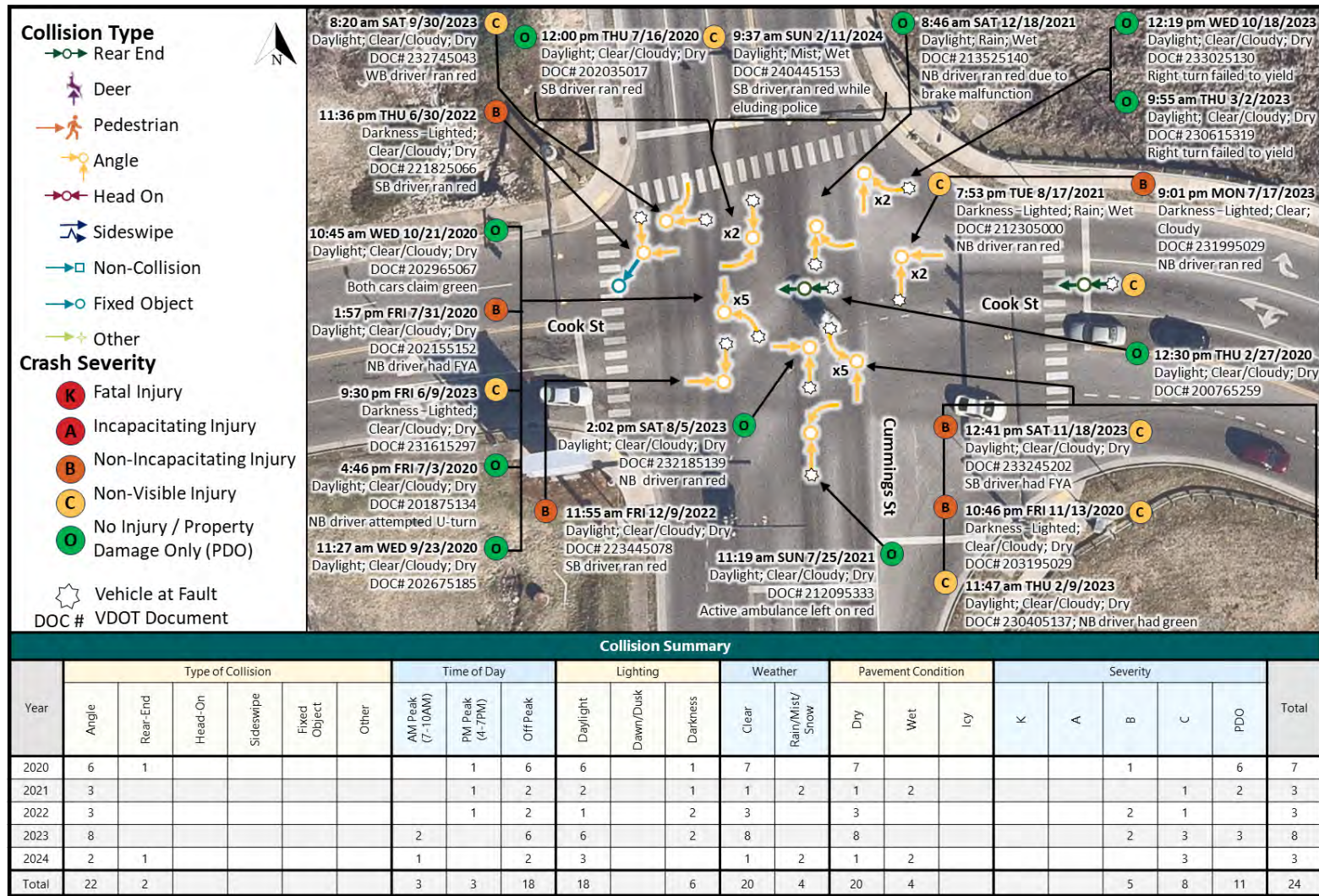


Figure 19: ALT US 58 (Cummings Street) at Cook Street Intersection Collision Diagram

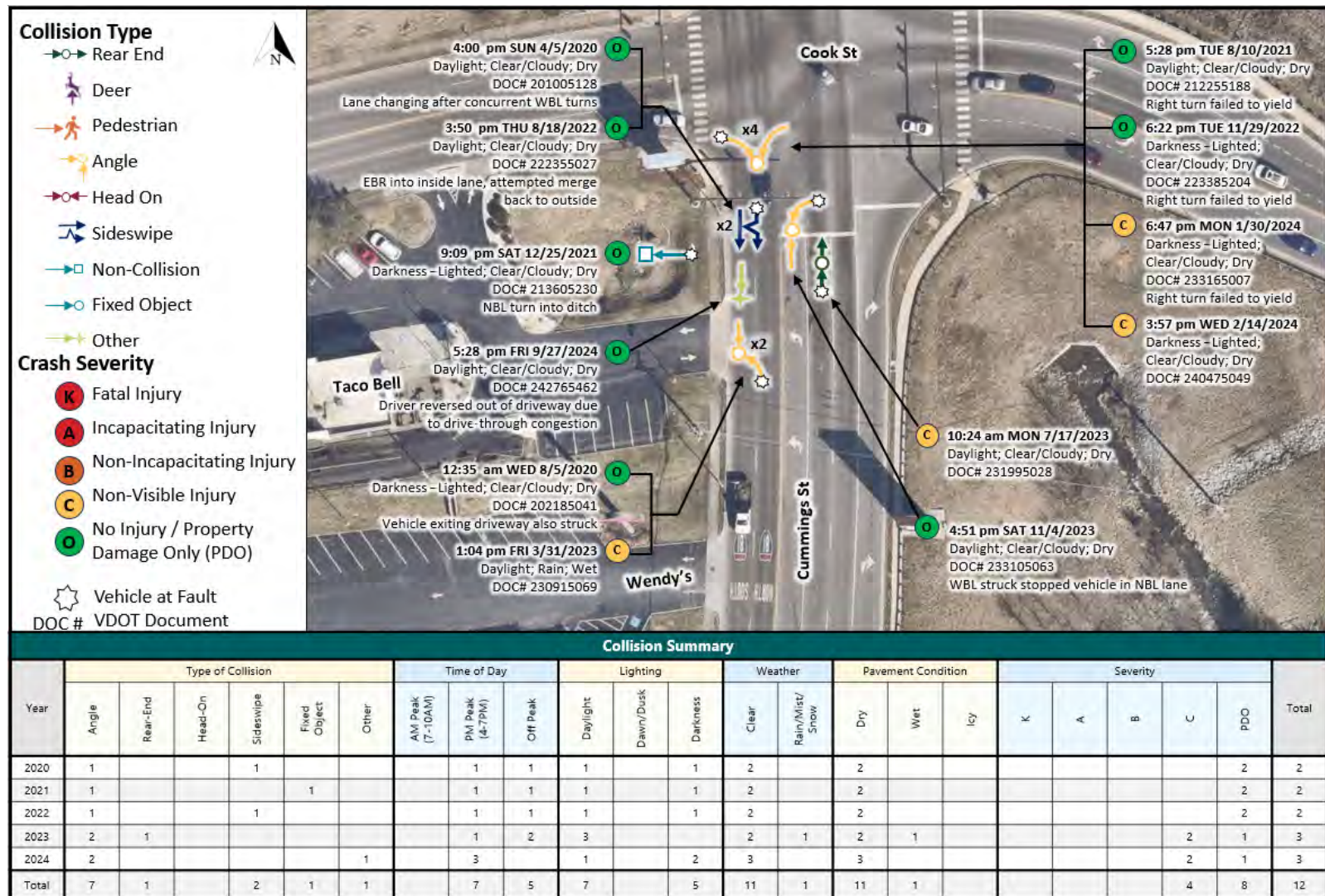


Figure 20: South Leg of ALT US 58 (Cummings Street) at Cook Street Intersection Collision Diagram

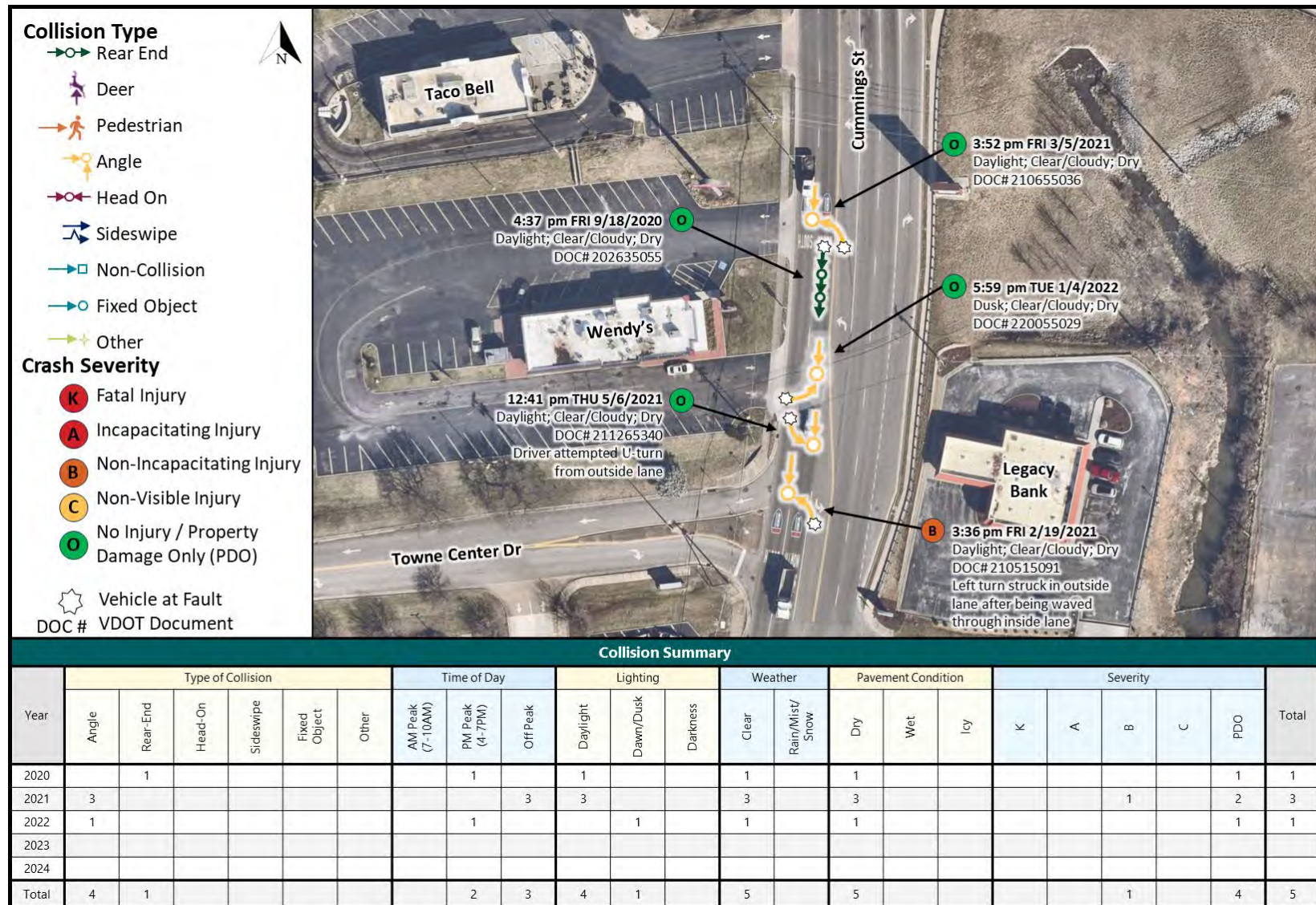


Figure 21: ALT US 58 (Cummings Street) at Towne Centre Drive Intersection Collision Diagram

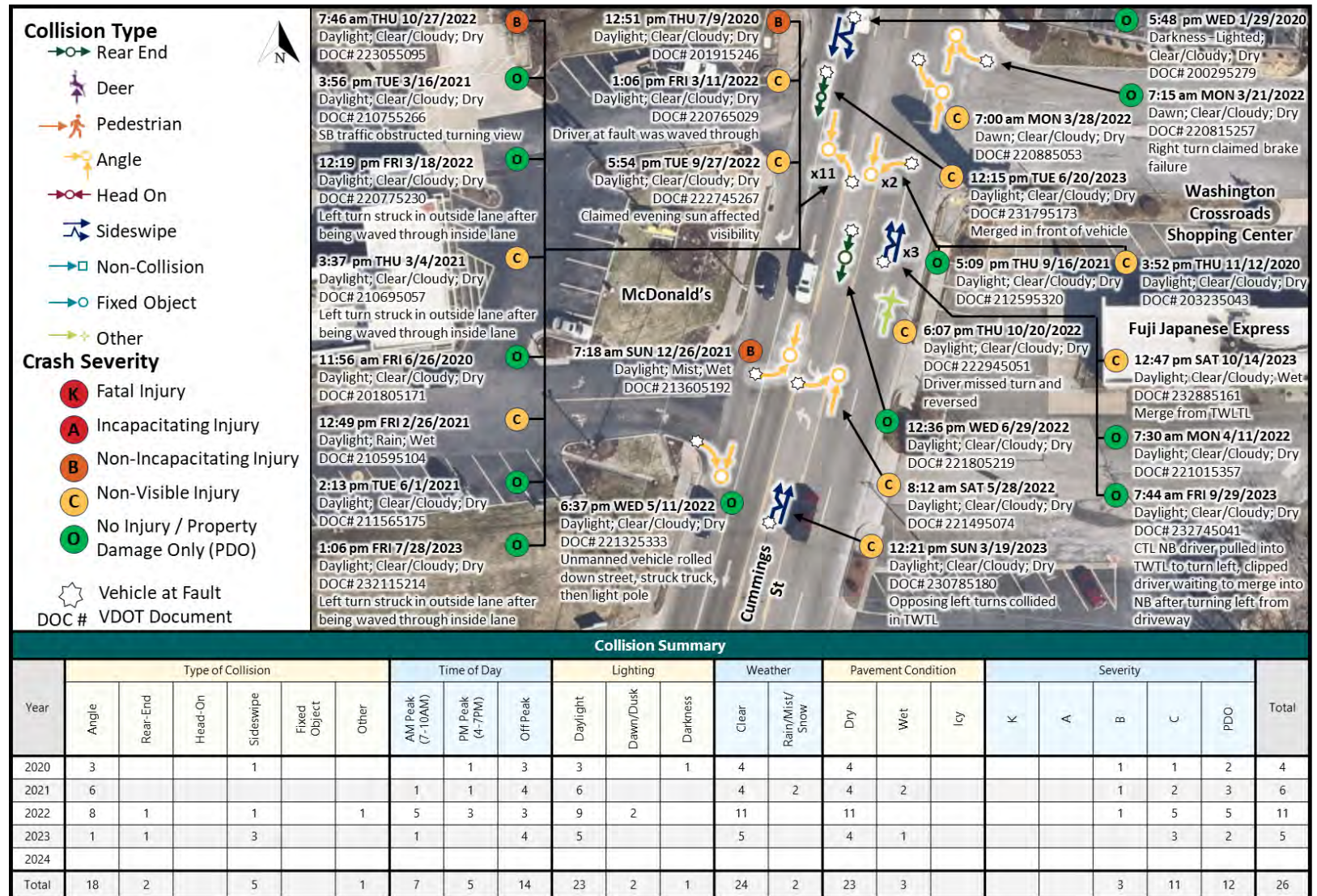


Figure 22: ALT US 58 (Cummings Street) at Shopping Center Driveway/McDonald's Driveway Intersection Collision Diagram

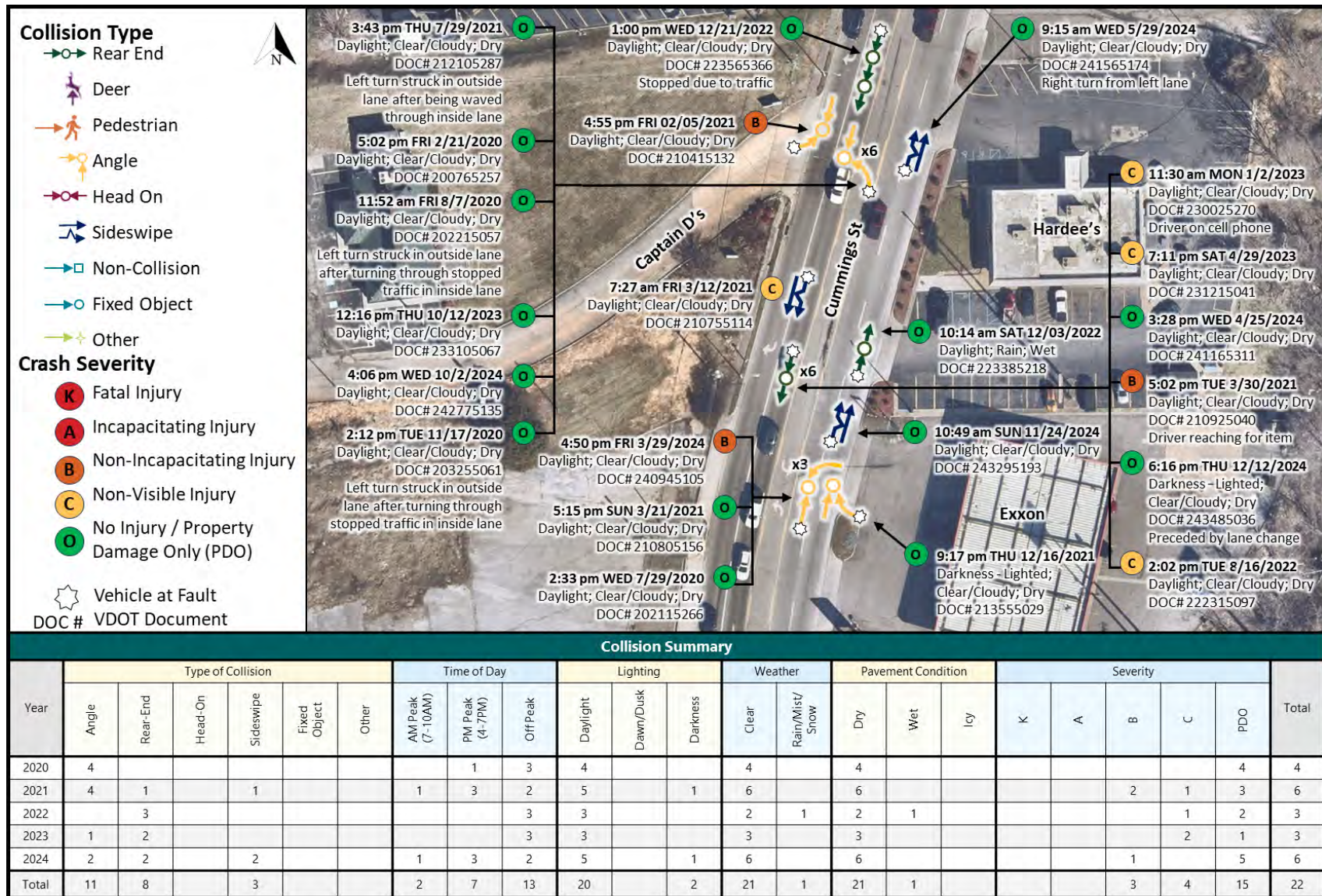


Figure 23: ALT US 58 (Cummings Street) at Captain D's/Hardee's/Exxon Entrance Intersection Collision Diagram

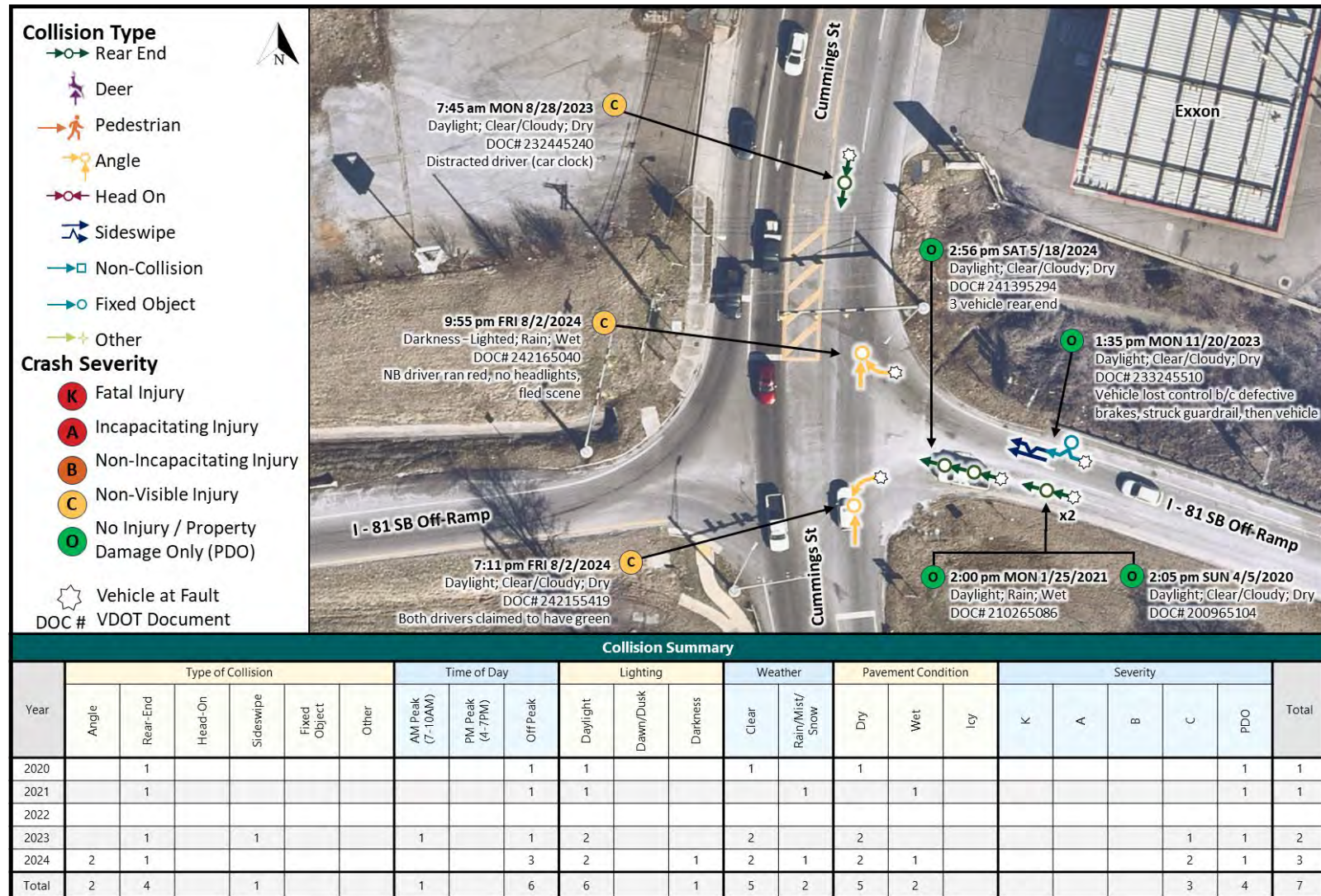


Figure 24: ALT US 58 (Cummings Street) at WB/SB I-81 Ramps Intersection Collision Diagram

Field Review Observations

A preliminary field review of the study area was conducted on April 23, 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 25**.

The following is a summary by location of field observations along ALT US 58 (Cummings Street):

Bradley Street to Fiddler's/Kroger Fuel Center

- Drivers use two-way left turn lane to make two-stage left turns exiting the Abingdon Shopping Center
- Vertical curvature (crest) in front of Mont Calm and Fiddler's/Kroger Fuel Center limits sight distance
- Lots of driveways
- Bus riders request to stop on southbound Cummings Street, cross to Kroger, and then catch the bus on the northbound return trip (input from Mountain Lynx Transit)

Cook Street Intersection

- Very limited sight distance to signal heads on southbound ALT US 58 (Cummings Street) approach due to horizontal and vertical curvature/topography; southbound signal mast arm becomes visible at Fiddler's/Kroger Fuel Center; signal ahead warning sign just south of Arby's
- Limited sight distance for northbound ALT US 58 (Cummings Street) left turn, which has protected/permissive phasing
- Poor lane utilization on westbound Cook Street approach in dual left turn lanes as drivers position themselves in desired approach lane to I-81 interchange
- Vehicular queue on westbound Cook Street extends past Green Spring Road during peak conditions
- One of the Taco Bell driveways is within the functional area of the intersection

Towne Centre Drive to I-81 Southbound Ramps

- Drivers use the two-way left turn lane to make two-stage left turns exiting commercial driveways
- High volume of visual input for drivers – signs, roadside, numerous driveways
- People not adhering to one-way commercial driveways with entrance/exit only signs
- Informal access management signing at Captain D's via Cook Street
- Lots of near-miss collisions
- Lane utilization / queue imbalance on southbound ALT US 58 (Cummings Street) approaching I-81 interchange
- Apparent high percentage of I-81 southbound off-ramp traffic turns right onto Cook Street

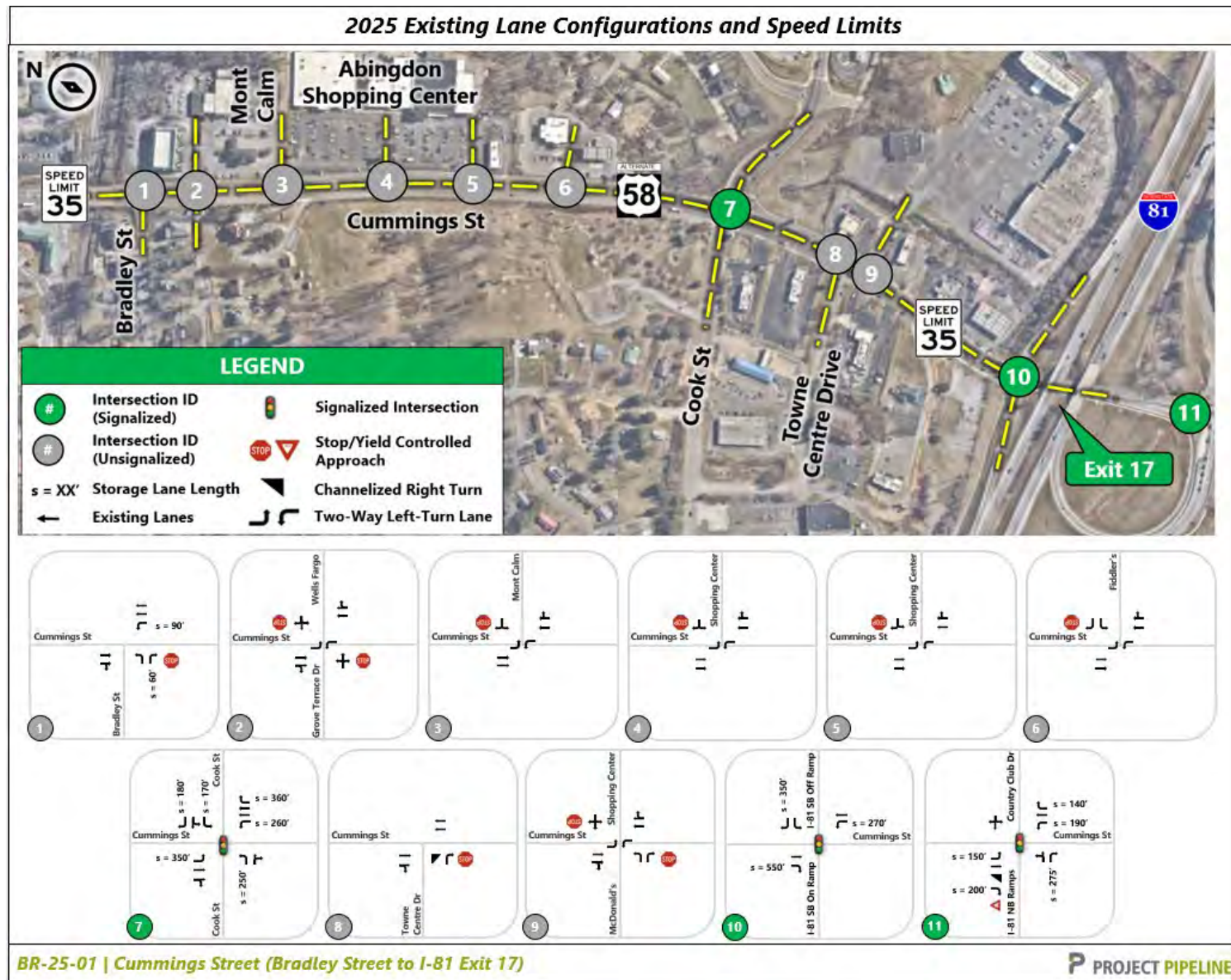


Figure 25: 2025 Existing Lane Configurations and Speed Limits

Synchro and SimTraffic 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 and SimTraffic 11.

The existing AM and PM Synchro models were developed based on the existing roadway geometry, collected traffic count data, and provided signal phasing/timing plans. Input and analysis methodologies were consistent with the VDOT Traffic Operations and Safety Analysis Manual (TOSAM), Version 2.0.

Traffic Data

72 hours of roadway segment volumes were collected from Tuesday, April 15th through Thursday, April 17th. The resulting average three-day daily traffic values can be seen in **Figure 26**. **Figure 27** displays the temporal distributions of ADT volume per hour through the study area. In addition to observing the traditional commuting AM and PM peak in this data, a midday peak corresponding with the businesses and restaurants along the corridor was also noted.

Additionally, the study team collected eight-hour turning movement count data for vehicles, pedestrians, and bicyclists on Wednesday, April 16, 2025, from 6:00 AM to 10:00 AM and 2:00 PM to 6:00 PM. The AM and PM network peak hours were determined to be 7:30 AM to 8:30 AM and 4:30 PM to 5:30 PM. Raw traffic data can be found in **Appendix C**. **Figure 28** displays the turning count movements experienced within the study area during AM and PM peak hours for the entire corridor. In some cases, volumes differed between intersections by more than 10%, so the study team balanced the volumes using the data collected at surrounding intersections.



Figure 26: ALT US 58 (Cummings Street) Average Daily Traffic (April 2025)

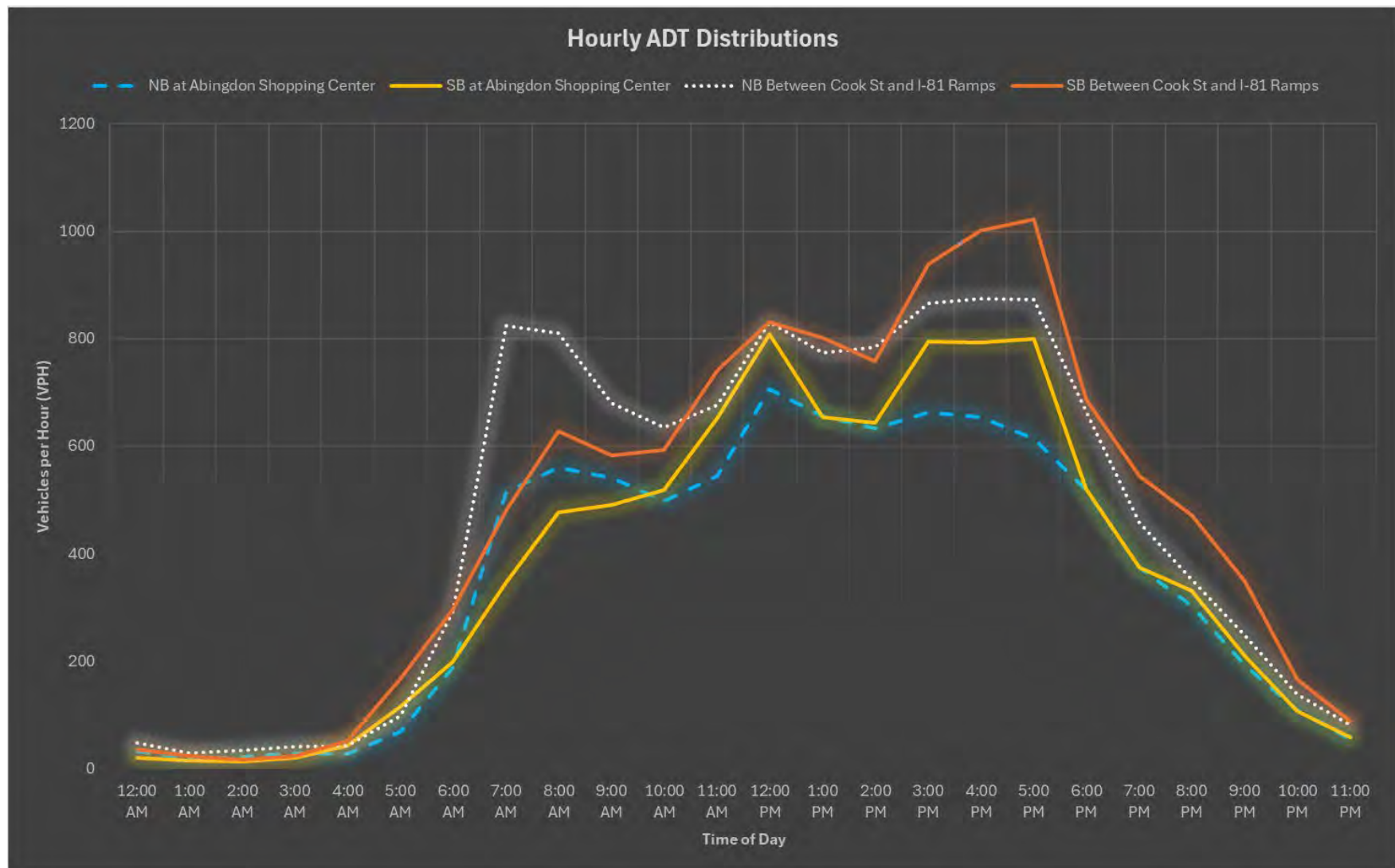


Figure 27: ALT US 58 (Cummings Street) Hourly ADT Temporal Distribution

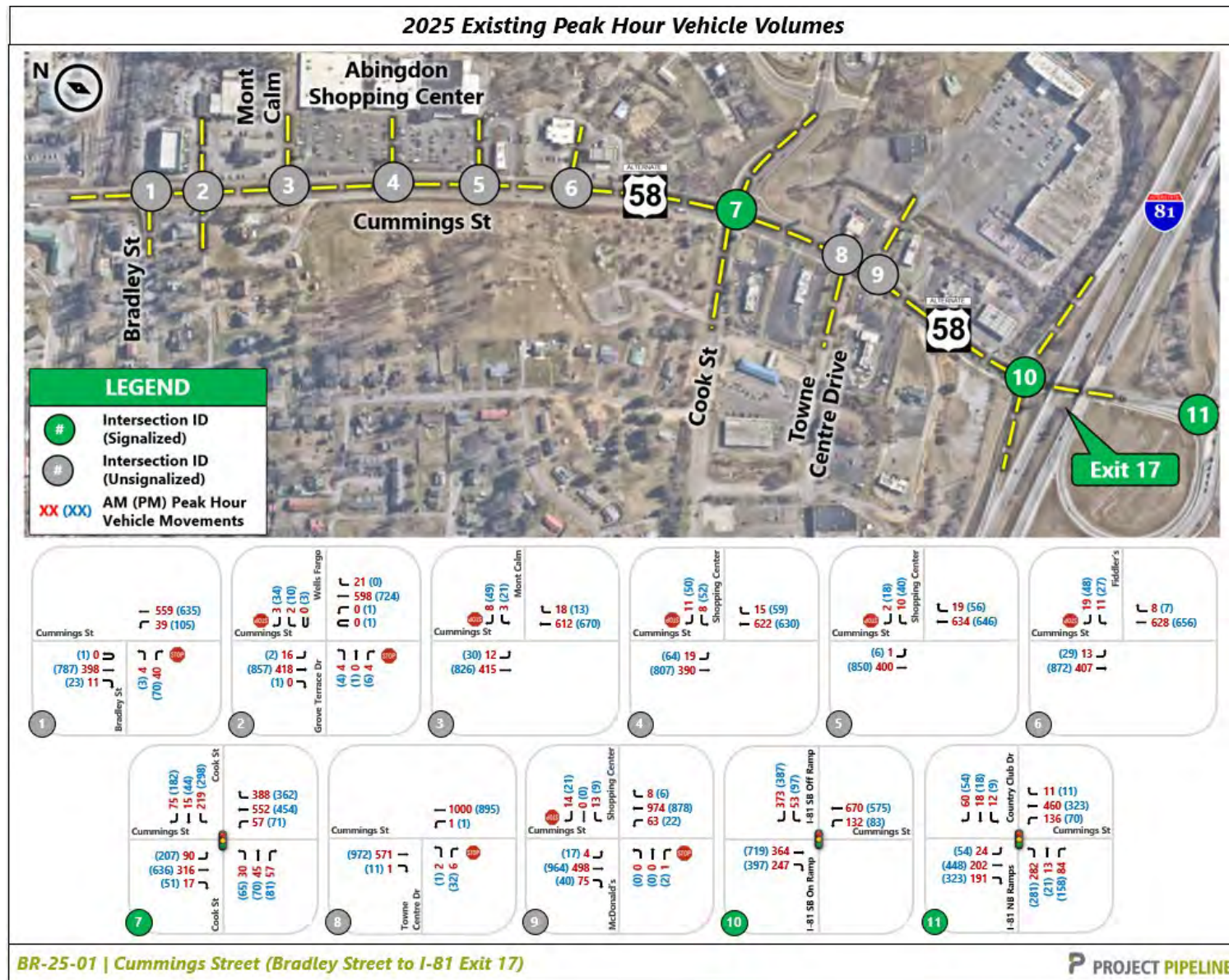


Figure 28: 2025 Existing Peak Hour Volumes

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 6 summarizes the LOS corresponding to the delay at unsignalized and signalized intersections as specified in the HCM. The delay criteria for LOS differ 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 6: 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

Traffic Analysis Results

Control delay (seconds per vehicle), LOS, and maximum queue length (feet) were selected as measures of effectiveness to quantitatively report the performance of each study intersection. **Table 7** summarizes the Synchro analysis used to determine control delay for each intersection.

Ten SimTraffic simulations were conducted for both the AM and PM models to determine vehicle queues. The full Synchro and SimTraffic reports are included in **Appendix D**. Synchro results for the existing condition models are included in **Table 8**. SimTraffic queuing results are shown in **Table 9**.

Table 7: Synchro Report for Control Delay

Intersection Name	Synchro Report for Control Delay
ALT US 58 (Cummings Street) at Bradley Street	HCM 6th TWSC
ALT US 58 (Cummings Street) at Grove Terrace Drive / Wells Fargo Driveway	HCM 6th TWSC
ALT US 58 (Cummings Street) at Mont Calm	HCM 6th TWSC
ALT US 58 (Cummings Street) at Abingdon Shopping Center North Driveway	HCM 6th TWSC
ALT US 58 (Cummings Street) at Abingdon Shopping Center South Driveway	HCM 6th TWSC
ALT US 58 (Cummings Street) at Fiddler's Driveway	HCM 6th TWSC
ALT US 58 (Cummings Street) at Cook Street	HCM 2000 Signalized
ALT US 58 (Cummings Street) at Towne Centre Drive	HCM 6th TWSC
ALT US 58 (Cummings Street) at Shopping Center Driveway/ McDonald's Driveway	HCM 6th TWSC
ALT US 58 (Cummings Street) at I-81 Southbound Ramps	HCM 2000 Unsignalized

Table 8: 2025 Existing Conditions Peak Hour Control Delay and LOS

Intersection Number and Description		Type of Control	Lane Group	Eastbound				Westbound				Northbound				Southbound				Overall LOS (delay)	
				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
1	ALT US 58 (Cummings Street) at Bradley Street	Unsignalized		Bradley Street								Cummings Street				Cummings Street				Intersection	
			Left	17.9	C	43	E					8.5	A	10.6	B					A (0.8)	A (1.3)
			Through									-	-	-	-	-	-	-	-		
			Right	9.9	A	12.5	B									-	-	-	-		
Approach	10.6	B	13.8	B	0.6	A	1.5	A	0	A	0	A									
2	ALT US 58 (Cummings Street) at Grove Terrace Drive / Wells Fargo Driveway	Unsignalized		Grove Terrace Drive				Wells Fargo Driveway				Cummings Street				Cummings Street				Intersection	
			Left	15.3	C	23.8	C	16.2	C	16.9	C	0	A	12	B	9.2	A	9.2	A	A (0.3)	A (0.6)
			Through									-	-	-	-	-	-	-	-		
			Right									-	-	-	-	-	-	-	-		
Approach	15.3	C	23.8									C	16.2	C	16.9	C	0	A	0		
3	ALT US 58 (Cummings Street) at Mont Calm	Unsignalized						Mont Calm				Cummings Street				Cummings Street				Intersection	
			Left					12.4	B	14.2	B					9	A	9.4	A	A (0.2)	A (0.8)
			Through									-	-	-	-	-	-	-	-		
			Right					12.4	B	14.2	B	-	-	-	-						
Approach	12.4	B	14.2	B	0	A	0	A	0.3	A	0.3	A									
4	ALT US 58 (Cummings Street) at Abingdon Shopping Center North Driveway	Unsignalized						Abingdon Shopping Center Central				Cummings Street				Cummings Street				Intersection	
			Left					13	B	18.9	C					9.1	A	9.6	A	A (0.4)	A (1.5)
			Through									-	-	-	-	-	-	-			
			Right					13	B	18.9	C	-	-	-	-						
Approach	13	B	18.9	C	0	A	0	A	0.4	A	0.7	A									
5	ALT US 58 (Cummings Street) at Abingdon Shopping Center South Driveway	Unsignalized						Abingdon Shopping Center South				Cummings Street				Cummings Street				Intersection	
			Left					14.1	B	17.9	C					9	A	9.3	A	A (0.2)	A (0.7)
			Through									-	-	-	-	-	-	-			
			Right					14.1	B	17.9	C	-	-	-	-						
Approach	14.1	B	17.9	C	0	A	0	A	0	A	0.1	A									
6	ALT US 58 (Cummings Street) at Fiddler's Driveway	Unsignalized						Fiddler's / Kroger Gas Station				Cummings Street				Cummings Street				Intersection	
			Left					16.1	C	18.9	C					9.4	A	9.3	A	A (0.5)	A (0.8)
			Through									-	-	-	-	-	-	-	-		
			Right					10.8	B	11.2	B	-	-	-	-						
Approach	12.7	B	14	B	0	A	0	A	0.3	A	0.3	A									
7	ALT US 58 (Cummings Street) at Cook Street	Signalized		Cook Street				Cook Street				Cummings Street				Cummings Street				Intersection	
			Left	31.3	C	35.4	D	28.1	C	32.6	C	14.7	B	16.2	B	15.8	B	17.4	B	C (21.5)	C (24.9)
			Through	32.3	C	37.8	D	27.8	C	31.5	C	24.9	C	27	C	21.4	C	24.9	C		
			Right	25.9	C	29	C	10.7	B	12.6	B										
Approach	32.1	C	37	D	27.5	C	31	C	18.8	B	20.3	C	20.2	C	23.2	C					
8	ALT US 58 (Cummings Street) at Towne Centre Drive	Unsignalized		Towne Centre Drive								Cummings Street				Cummings Street				Intersection	
			Left																	A (0.1)	A (0.2)
			Through									-	-	-	-	-	-	-	-		
			Right	10.1	B	12	B									-	-	-	-		
Approach	10.1	B	12	B	0	A	0	A	0	A	0	A									
9	ALT US 58 (Cummings Street) at Shopping Center Driveway/ McDonald's Driveway	Unsignalized		McDonald's Driveway				Shopper Center / Hampton Inn				Cummings Street				Cummings Street				Intersection	
			Left	9.9	A	11.5	B	54.4	F	28.6	D	9.2	A	11.3	B	10.8	B	10.1	B	A (1.3)	A (0.7)
			Through									-	-	-	-	-	-	-			
			Right									-	-	-	-	-	-	-			
Approach	9.9	A	11.5	B	54.4	F	28.6	D	0.6	A	0.3	A	0.1	A	0.2	A					
10	ALT US 58 (Cummings Street) at I-81 Southbound Ramps	Signalized						Southbound I-81 Off-Ramp				Cummings Street				Cummings Street				Intersection	
			Left					29.1	C	25.8	C	22.7	C	49	D					C (24.6)	D (41.5)
			Through									16.9	B	19.4	B	27.5	C	73.5	E		
			Right					36.5	D	30.8	C					23.4	C	28.3	C		
Approach	35.6	D	29.8	C	17.8	B	23.1	C	25.8	C	57.4	E									

- No delay or level of service provided by Synchro. Movement exists

Approach or movement does not exist

Table 9: 2025 Existing Conditions Peak Hour Maximum Queues

Intersection Number and Description		Type of Control	Lane Group	Eastbound		Westbound		Northbound		Southbound	
				AM	PM	AM	PM	AM	PM	AM	PM
				Delay	Delay	Delay	Delay	Delay	Delay	Delay	Delay
1	ALT US 58 (Cummings Street) at Bradley Street	Unsignalized	Left Through Right	Bradley Street				Cummings Street		Cummings Street	
				21	230			37	67		
								8	8	3	321*
				58	57					2	312*
2	ALT US 58 (Cummings Street) at Grove Terrace Drive / Wells Fargo	Unsignalized	Left Through Right	Grove Terrace Drive		Wells Fargo Driveway		Cummings Street		Cummings Street	
				28	46	19	148	-	9	24	11
								-	11	9	73
								7	9	-	74
3	ALT US 58 (Cummings Street) at Mont Calm	Unsignalized	Left Through Right			Mont Calm		Cummings Street		Cummings Street	
						42	149			24	38
								-	-	5	107
						42	149	-	3		
4	ALT US 58 (Cummings Street) at Abingdon Shopping Center	Unsignalized	Left Through Right			Abingdon Shopping Center Central		Cummings Street		Cummings Street	
						46	267			29	48
								4	7	9	167
						46	267	-	10		
5	ALT US 58 (Cummings Street) at Abingdon Shopping Center	Unsignalized	Left Through Right			Abingdon Shopping Center South		Cummings Street		Cummings Street	
						35	217			6	131
								3	5	-	121
						35	217	-	7		
6	ALT US 58 (Cummings Street) at Fiddler's Driveway	Unsignalized	Left Through Right			Fiddler's / Kroger Gas Station		Cummings Street		Cummings Street	
						35	97			25	38
								-	-	12	162
						44	49	-	4		
7	ALT US 58 (Cummings Street) at Cook Street	Signalized	Left Through Right	Cook Street		Cook Street		Cummings Street		Cummings Street	
				61	93	100	165	57	75	93	215
						120	549	180	168	124	402
						56	134	106	129		
8	ALT US 58 (Cummings Street) at Towne Centre Drive	Unsignalized	Left Through Right	Towne Centre Drive				Cummings Street		Cummings Street	
				-	156			4	5	10	392
										13	298
9	ALT US 58 (Cummings Street) at Shopping Center Driveway/	Unsignalized	Left Through Right	McDonald's Driveway		Shopper Center / Hampton Inn		Cummings Street		Cummings Street	
				9	16	67	160	34	39	11	23
								5	273	14	60
								13	36	31	71
10	ALT US 58 (Cummings Street) at I-81 Southbound Ramps	Signalized	Left Through Right			Southbound I-81 Off-Ramp		Cummings Street		Cummings Street	
						141	439	238	200		
								437	408	300	666
						330	350			208	386

- No queue length provided by SimTraffic report. Movement exists

Approach or movement does not exist

* During some simulations the southbound queue extends to the Bradley St intersection

Under existing conditions, the ALT US 58 (Cummings Street) and Cook Street intersection operates at LOS D for the eastbound approach with a 37 second per vehicle delay during the PM peak hour. The intersection queue lengths differed significantly between the AM and PM peak hours for the eastbound, southbound, and westbound approaches. The westbound approach has only a max queue length of 120 feet in the AM peak hour, but the queue extends past Green Spring Road with a max queue length of 549 feet in the PM peak hour. **Figure 29** and **Figure 30** display the peak hour queue lengths at the signalized study intersections.

The westbound approach (McDonald's driveway) at the ALT US 58 (Cummings Street) and McDonald's Entry Driveway intersection was significant in terms of delay. The approach operated at LOS F with a 54.4 second per vehicle delay in the AM peak hour and LOS D with a 28.6 second per vehicle delay in the PM peak hour. Drivers were observed using the two-way left-turn lane (TWLTL) to complete a two-stage left turn movement exiting the driveways, thereby reducing experienced delay compared to this model.

The ALT US 58 (Cummings Street) and I-81 Southbound Ramps intersection was significant in terms of delay and queue lengths. The intersection operated at LOS D with a 41.5 second per vehicle delay in the PM peak hour. The AM peak hour westbound approach operated at LOS D with a 35.6 second per vehicle delay. The PM peak hour southbound approach operated at LOS E with a 57.4 second per vehicle delay. The southbound approach had a max queue length of 666 feet and backs up to Towne Centre Drive according to the model.

The following trends were observed under existing conditions:

AM Peak Hour

- The intersections of ALT US 58 (Cummings Street) at Cook Street and ALT US 58 (Cummings Street) at I-81 Southbound Ramps operated at LOS C. All other intersections operated at LOS A
- The westbound approaches for the intersections of ALT US 58 (Cummings Street) at Shopping Center/McDonald's Driveway and ALT US 58 (Cummings Street) at I-81 Southbound Ramps operated at LOS F and LOS D, respectively. All other intersection approaches operated at LOS C or above

PM Peak Hour

- The intersections of ALT US 58 (Cummings Street) at Cook Street and ALT US 58 (Cummings Street) at I-81 Southbound Ramps operated at LOS C and D, respectively. All other intersections operated at LOS A
- The eastbound left lane group for the intersection of ALT US 58 (Cummings Street) at Bradley Street operated at LOS E
- The southbound through lane group for the intersection of ALT US 58 (Cummings Street) at I-81 Southbound Ramps operated at LOS E and had the highest delay for any lane group or movement at 73.5 seconds per vehicle
- Queue lengths were noticeably longer than the AM peak hour for the ALT US 58 (Cummings Street) at Cook Street and ALT US 58 (Cummings Street) at I-81 Southbound Ramps intersections

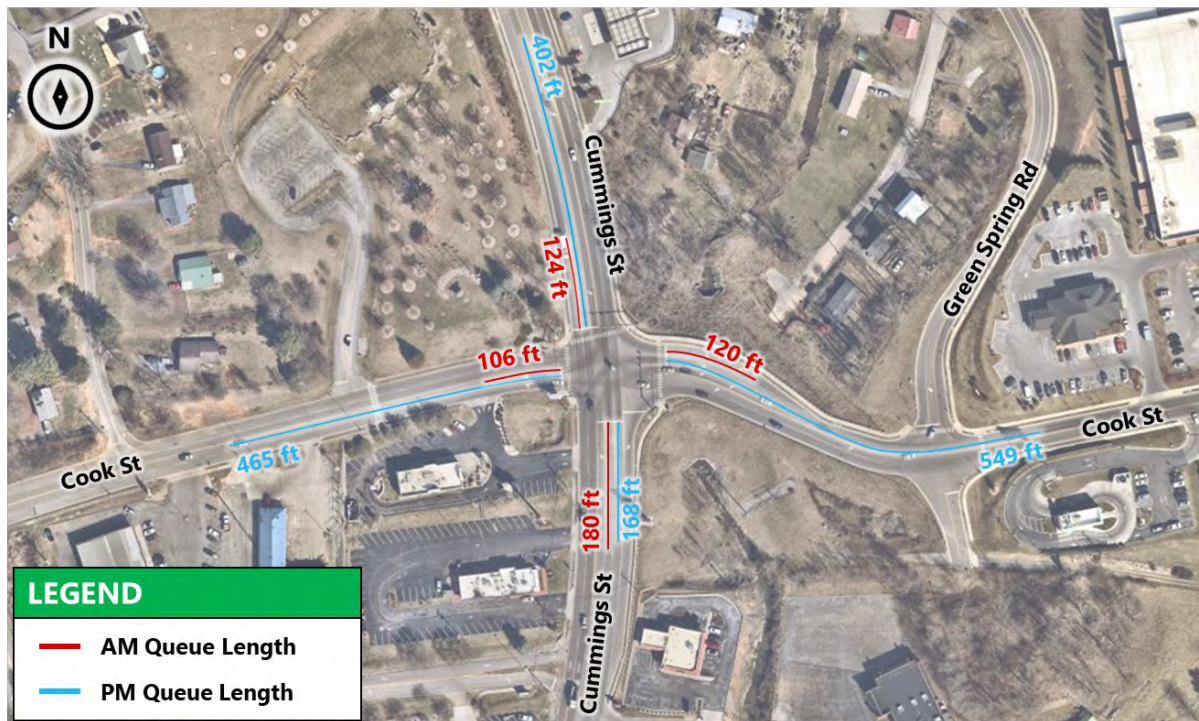


Figure 29: SimTraffic Queues at ALT US 58 (Cummings Street) at Cook Street



Figure 30: SimTraffic Queues at ALT US 58 (Cummings Street) at I-81 Southbound Ramps

1.6.2 Phase 1 Public Outreach

The Phase 1 Public Input online survey was held from May 27, 2025, to June 10, 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 440 participants and received 500 comments. Detailed results from the Phase 1 public outreach efforts can be found in **Appendix E**.

Participant travel information is as follows.

- Mode of travel: 100% personal vehicle (335 respondents), 17% walking (58 respondents), 10% cycling (33 respondents)
- 86% (286 respondents) travel during weekday afternoon rush (4:00 PM – 7:00 PM), 66% (222 respondents) travel during weekends, 62% (206 respondents) travel during weekday midday (9:00 AM – 4:00 PM), and 58% (195 respondents) travel during weekday morning rush (6:00 AM – 9:00 AM)

Participants ranked reducing traffic congestion and corridor safety / intersection safety as the two most critical issues in the study area. Sudden stopping and rear-end crashes were identified by respondents as their top safety issue concern. Difficulty weaving and merging was identified as the second highest safety issue concern. These concerns and issues can be referenced in **Figure 31** and **Figure 32**. Common themes among written comments related to safety concerns were as follows:

- People running red lights at the intersection of ALT US 58 (Cummings Street) and Cook Street
- Disregard for traffic rules throughout study area
- Difficulty seeing lane markings and signage to safely make decisions

178 respondents (74%) identified crosswalks and pedestrian signals, 106 respondents (44%) identified sidewalks, and 95 respondents (39%) identified bicycle lanes as needed multimodal facilities in the study area. Common themes among written comments related to multimodal facilities were as follows:

- Improve existing sidewalks and crosswalks to improve safety, accessibility, and efficiency
- Improve pedestrian connections between transit stops and destinations such as Kroger
- Bicycle facilities that allow safe access to nearby destinations such as local business, nearby parks, and the Virginia Creeper Trail

Most congestion (89%, 314 respondents) and mobility issues (84%, 269 respondents) are experienced during the weekday afternoon rush (4:00 PM – 7:00 PM). Participants identified difficulty making left turns as the highest ranked mobility issue (66%, 216 respondents). Common themes among written comments related to congestion and mobility concerns were as follows:

- Difficulty entering and exiting ALT US 58 (Cummings Street) at intersections with Bradley Street, Abingdon Shopping Center, and fast-food restaurants along Cummings Street
- Congestion influencing drivers to make poor decisions such as merging into tight spaces and blocking intersections
- Weekend congestion during summer due to traffic from South Holston Lake

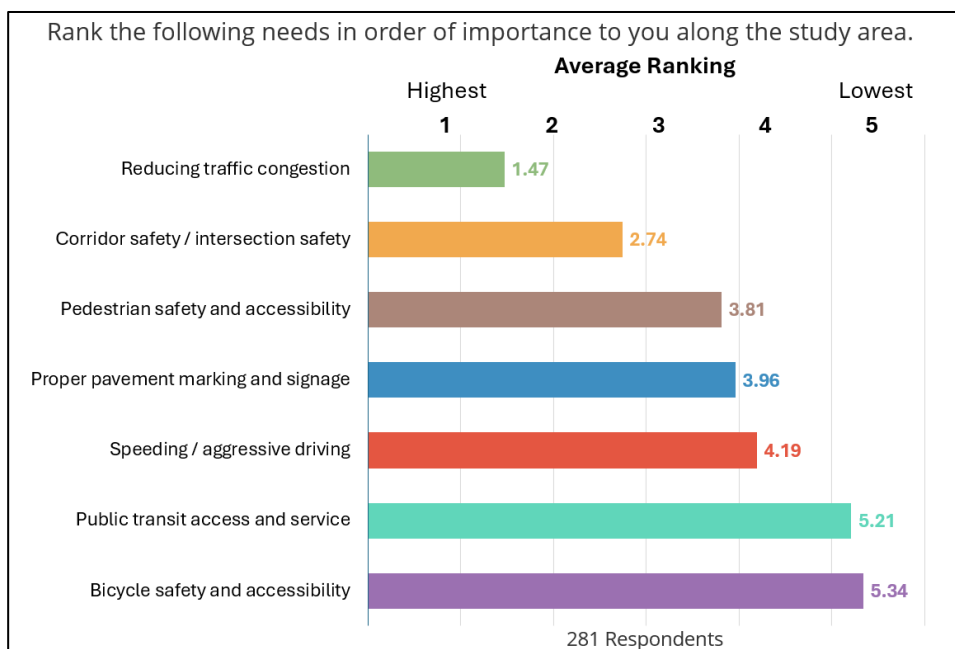


Figure 31: Ranked Corridor Needs Public Feedback



Figure 32: Public Outreach Identified Safety Concerns

1.6.3 No-Build Conditions Traffic Operations Analysis

No-Build 2054 Volume Development

Traffic operational analyses were conducted to evaluate the overall performance of the study corridor under No-Build (2054) 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.

The Town of Abingdon is within Bristol's Metropolitan Planning Organization (MPO), which has a Travel Demand Model (TDM); however, the existing TDM was not structured to provide the appropriate level of detail and precision for this project. Even after two rounds of revisions to the existing TDM – including the addition of multiple new roadways, new and modified connectors not originally included, and adjusted intersection capacity, VDOT and the MPO concluded that the TDM was still insufficiently calibrated to accurately project the future traffic patterns within the study area. As such, the study team focused on historical growth trends in Pathways for Planning data, known and potential land use development projects, and two previous transportation studies that evaluated the Cook Street extension / French Moore Boulevard extension - the Town of Abingdon's 2012 Connector Road Study and VDOT's 2020 I-81 Frontage Road Study. The study team synthesized this data and recommended overall traffic growth and pattern adjustments that represent a reasonable future volume for the study area.

The following sources were reviewed to determine the growth rates to apply to existing traffic volumes to forecasted future background (2054) traffic volumes.

Historical Traffic Count Data

Table 10 displays a comparison between the historical Average Annual Daily Traffic (AADT) for ALT US 58 (Cummings Street), the linear annual growth rates computed from those AADT values via linear regression, and the VDOT P4P growth rate. Per VDOT policy on how to manage 2020 and 2021 COVID-impacted traffic counts, the study team has excluded those two years of AADT from the linear regression calculation. The data trend from 2012 onward was identified as relatively stable and appropriate for forecasting. As indicated in the historical linear regression column of **Table 10**, the study area volume segment has experienced a declining volume trend over the past 13 years. When calculating annual growth from just field-counted data, the corridor has experienced -1.5% annual linear decline in traffic. When calculating annual growth from all data (field-counted and grown), the corridor has experienced -1.10% annual linear decline in traffic.

Table 10: Linear Growth Rate Development

ID	Segment	VDOT Historical Linear Regression Annual Growth Rate (2011-2019, 2022-2024)	VDOT P4P Regression Annual Growth Rate	Recommended Linear Growth Rate
1	ALT US 58 (Cummings Street) (R-VA SR0075NB)	-1.10% ¹ -1.50% ²	0.50%	0.50%

1 Annual growth rate derived from all VDOT AADT records, both field-counted and grown.

2 Annual growth rate derived from just field-counted VDOT AADT records.

Pathways for Planning Forecast

VDOT's Pathways for Planning web tool contains the official VDOT trend analysis for volume forecasts. This trend analysis is derived from the historical AADT linear regression calculations; however, if the linear regression calculations compute an annual growth rate less than 0.50%, then 0.50% is utilized as the minimum value.

Rerouting due to Roadway Projects

The redistributed traffic patterns due to the Cook Street / French Moore Boulevard extension project were determined using two previous studies. The study team could not retrieve a traffic forecast directly from either of these studies; however, the team extracted specific elements of each to utilize in development of a forecast.

The Town of Abingdon's 2012 Connector Road Study directly evaluated the Cook Street and French Moore Boulevard extension projects; however, it is based on fifteen-year-old data, aggressive traffic growth assumptions, and pre-dates the substantial Food City anchored development project on the east side of Cummings Street. The study team extracted the trip distribution percentages from this study to determine the new traffic patterns that will occur as a result of the extension.

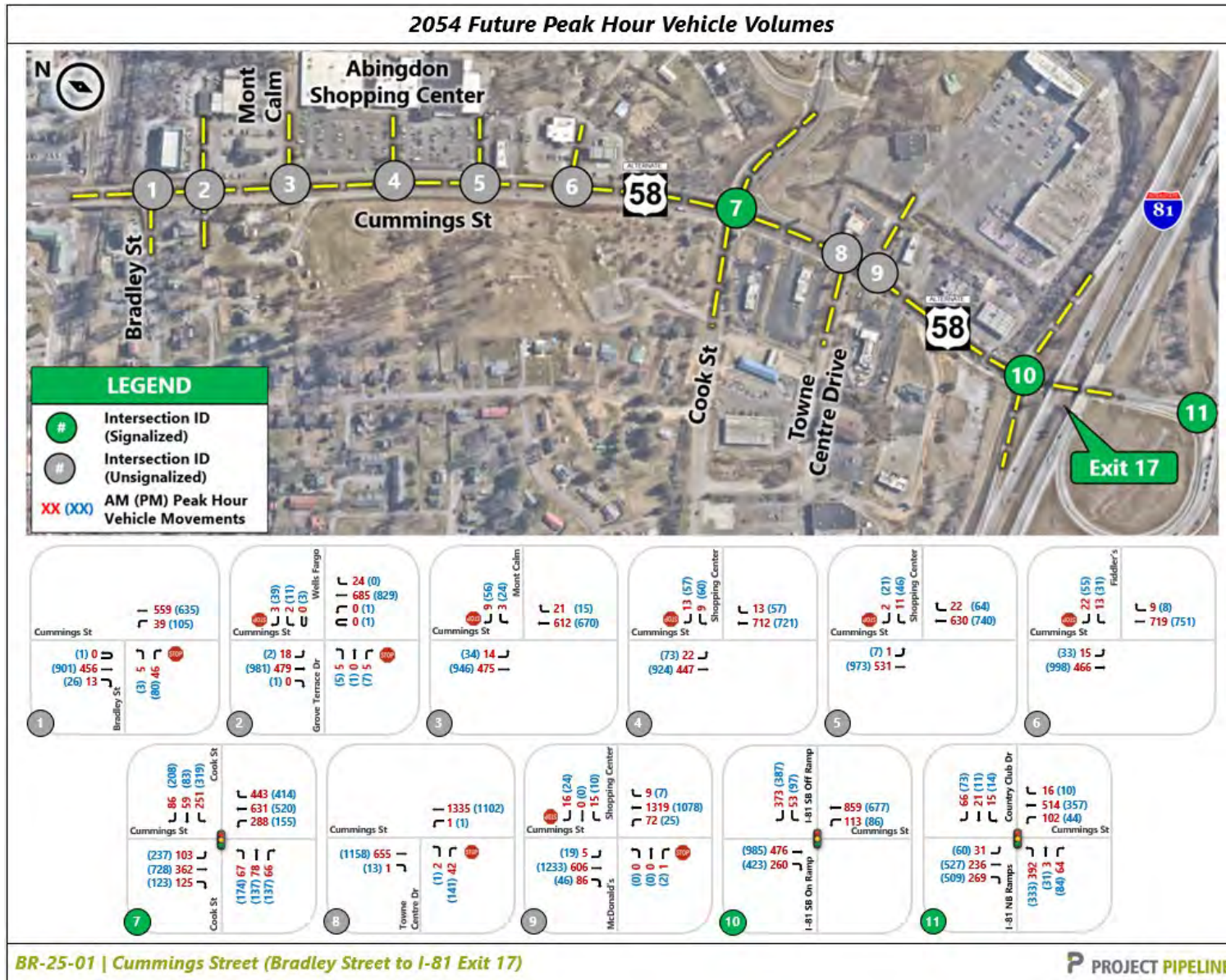
The I-81 Frontage Road Study explored the potential for frontage roads parallel to I-81 between Exit 7 and Exit 22; this study identified a projected ADT of 2,300 vehicles per day on the Cook Street / French Moore Boulevard extension but developed its full traffic pattern forecast in tandem with proposed frontage roads east of I-81. The 2035 projected ADT for the Cook Street / French Moore Boulevard extension from this study was used to calculate a 2025 ADT for the extension.

The step-by-step process of determining the new traffic pattern with these two studies is outlined in the Traffic Forecasting Memorandum which is included in **Appendix F**.

The forecasted future volumes also include the future development within Abingdon Towne Centre. For the purposes of this volume forecasting effort, three planned land uses within the expansion project were identified. These three planned land uses include a multi-use sports complex, office space, and a hotel. The trip generation methodology outlined in the *ITE Trip Generation Manual*, 12th Edition, was used to determine the site trips for each of these land uses. These site-generated trips were subsequently distributed along the roadway network using logical trip distributions and knowledge of local travel patterns. Distribution included the new Cook Street and French Moore Boulevard extension. Then, the trips were added to the grown and rerouted background volumes to develop the base future traffic volumes for the study area.

The No-Build (2054) AM and PM peak hour volumes including the background growth based on the determined growth rate, the redistributed traffic due to the Cook Street and French Moore Boulevard extension project, and the known future developments are shown in **Figure 33**.

Figure 33: 2054 No-Build Peak Hour Volumes



VISSIM Analysis

Traffic operational analyses were conducted to evaluate the overall performance of the study intersections under No-Build (2054) AM and PM peak hour conditions. The intent of No-Build conditions analysis was to provide a general understanding of the baseline future traffic conditions as a starting point for developing improvement alternatives. No-Build conditions were modeled using VISSIM 21 for the entire study area. Synchro/SimTraffic was not the most appropriate traffic software for this location due to the complexities of the signal control and preemption within the study area. The southbound I-81 offramp has queue detection / signal preemption and the entire Exit 17 interchange operates on the same signal controller; therefore, VISSIM was determined to be the appropriate software for analysis as it can analyze freeway facilities and complex traffic signal control scenarios.

The existing AM and PM VISSIM models were developed based on the existing roadway geometry, collected traffic count data, provided signal phasing/timing plans, and observations of the existing traffic behavior. Input and analysis methodologies were consistent with the VDOT Traffic Operations and Safety Analysis Manual (TOSAM), *Version 2.0* and VDOT's *VISSIM User Guide 2.0*. The VISSIM calibration memorandum documents all the calibration assumptions and methodology in greater detail. This memorandum is in **Appendix G**. Once calibrated, the study team used the model to obtain traffic analysis results.

The existing conditions VISSIM 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 2054 No-Build traffic volumes. 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.

Ten simulations were conducted for both the AM and PM No-Build VISSIM models. Control delay (seconds per vehicle), average queue length (feet), and maximum queue length (feet) were selected as measures of effectiveness to quantitatively report the performance of each study intersection.

In the existing conditions VISSIM model, the ALT US 58 (Cummings Street) and Cook Street intersection had an overall intersection delay of 11.5 seconds and 14.6 seconds in the AM and PM peak hours respectively. The northbound and southbound approaches operate with minimal delay and minor queue lengths, whereas the eastbound and westbound approaches have higher approach delays and longer queue lengths. The eastbound approach has the highest delays with 38.6 seconds in the AM peak hour and 35.4 seconds in the PM peak hour. Both the eastbound and westbound approaches have similar average and max queue lengths. Under No-Build conditions, the overall intersection delay is expected to increase to 18.7 and 34.6 seconds in the AM and PM peak hours, respectively. The northbound approach is expected to continue to operate with minimal delays and queue length. The southbound approach delay and queue lengths are expected to increase in both the AM and PM peak hours, including significant increases in the PM peak hour. This increase is partially due to green time starvation with southbound Cummings Street queue lengths extending from the I-81 interchange through Cook Street. Detailed VISSIM results of this intersection can be seen in **Table 11**.

The ALT US 58 (Cummings Street) and I-81 southbound off-ramp intersection had an overall intersection delay of 17.0 seconds and 21.1 seconds in the AM and PM peak hours, respectively. The westbound approach has relatively higher delays in the AM and PM peak hour and the southbound approach has a similar delay in the PM peak hour. All the approaches have relatively longer queue lengths in both the AM

and PM peak hours, except for the southbound approach in the AM peak hour. The longest maximum queues in both peak hours occur on the northbound approach; additionally, the off-ramp maximum queue lengths approach the ramp gore in the AM peak hour. Under No-Build conditions, the overall intersection delay is expected to increase to 56.5 and 94.3 seconds in the AM and PM peak hours, respectively. The westbound approach is expected to have the highest delays and longest queue lengths in both the AM and PM peak hours, with maximum queue lengths exceeding the length of the I-81 southbound off ramp and spilling back up to a half-mile upstream on southbound I-81. The southbound approach is expected to have the second highest delay in No-Build conditions in both the AM and PM peak hours. Detailed VISSIM results of this intersection can be seen in **Table 12**.

The ALT US 58 (Cummings Street) and Country Club Drive / I-81 northbound ramp intersection had an overall intersection delay of 23.1 and 14.4 in the AM and PM peak hours, respectively. The northbound and eastbound approaches have higher delays and queue lengths at this intersection. The westbound approach has a similar delay in the AM peak hour; however, this approach has significantly less volume compared to the other approaches. Under No-Build conditions, the overall intersection delay is expected to increase to 95.9 and 20.3 seconds in the AM and PM peak hours, respectively. In the AM peak hour, the delays and queue lengths are expected to be higher compared to the anticipated delay and queue lengths in the PM peak hour, with the northbound approach expected to have the highest delay and longest queue length. Detailed VISSIM results of this intersection can be seen in **Table 13**.

The Green Spring Road and Cook Street intersection operates with minimal delay and queue lengths in both existing and No-Build conditions. Detailed VISSIM results of this intersection can be seen in **Table 14**.

Table 11: ALT US 58 (Cummings Street) and Cook Street Intersection VISSIM Results – No-Build

Scenario	Approach	Lane Group	Movement Delay (sec)		Approach Delay (sec)		Average Queue (ft)		Maximum Queue (ft)	
			AM	PM	AM	PM	AM	PM	AM	PM
Existing	Cook Street	WBL	21.0	29.0	21.5	19.1	30	49	144	310
		WBT	20.7	27.3			30	49	144	310
		WBR	23.2	1.6			30	49	144	310
	Cummings Street	NBL	5.6	9.0	5.9	9.6	28	37	242	209
		NBT	10.0	17.0			28	37	242	209
		NBR	0.2	0.5			26	35	255	222
	Cook Street	EBL	28.7	31.9	38.6	35.4	32	45	194	227
		EBT	60.8	49.3			32	45	194	227
		EBR	26.2	25.5			30	43	198	230
	Cummings Street	SBL	6.6	10.9	8.7	11.9	18	48	155	289
		SBT	9.1	12.5			18	48	155	289
		SBR	10.5	9.0			18	50	155	296
	Intersection				11.5	14.6	-			
No Build (2054)	Cook Street	WBL	32.6	58.8	32.7	42.3	60	137	316	413
		WBT	36.0	61.3			60	137	316	413
		WBR	30.8	9.3			60	137	316	413
	Cummings Street	NBL	10.6	24.7	9.3	17.6	44	71	231	295
		NBT	14.6	28.5			44	71	231	295
		NBR	0.9	1.6			41	72	244	308
	Cook Street	EBL	35.8	41.1	45.9	58.2	61	81	306	332
		EBT	62.4	82.3			61	81	306	332
		EBR	35.5	54.8			59	80	310	335
	Cummings Street	SBL	9.3	32.2	19.4	42.6	63	254	277	930
		SBT	20.2	46.5			63	254	277	930
		SBR	25.1	40.1			63	258	277	937
	Intersection				18.7	34.6	-			

Table 12: ALT US 58 (Cummings Street) and I-81 Southbound Ramp Intersection VISSIM Results – No-Build

Scenario	Approach	Lane Group	Movement Delay (sec)		Approach Delay (sec)		Average Queue (ft)		Maximum Queue (ft)	
			AM	PM	AM	PM	AM	PM	AM	PM
Existing	I-81 SB Off-Ramp	WBL	22.7	49.3	24.0	19.2	94	78	616	456
		WBR	24.2	25.5			94	78	615	456
	Cummings Street	NBL	8.9	10.9	16.5	16.0	111	82	1,092	788
		NBT	18.0	12.5			111	82	1,092	788
	Cummings Street	SBT	19.8	9.0	12.5	25.2	57	253	440	846
		SBR	1.6	49.3			57	251	440	843
	Intersection				17.0	21.1	-			
No Build (2054)	I-81 SB Off-Ramp	WBL	120.3	137.5	118.3	141.3	965	1,164	2,996	2,413
		WBR	118.0	142.2			965	1,163	2,996	2,413
	Cummings Street	NBL	21.7	21.8	29.0	20.4	258	136	2,584	1,074
		NBT	29.9	20.2			258	136	2,584	1,074
	Cummings Street	SBT	54.5	133.7	41.2	119.5	232	819	776	1,134
		SBR	17.2	87.5			232	817	776	1,132
	Intersection				56.5	94.3	-			

Table 13: ALT US 58 (Cummings Street) and I-81 Northbound Ramp/Country Club Drive Intersection VISSIM Results – No-Build

Scenario	Approach	Lane Group	Movement Delay (sec)		Approach Delay (sec)		Average Queue (ft)		Maximum Queue (ft)	
			AM	PM	AM	PM	AM	PM	AM	PM
Existing	Country Club Drive	WBL	44.7	39.1	29.2	18.1	15	9	134	126
		WBT	43.9	39.1			15	9	134	126
		WBR	19.6	9.5			19	12	167	158
	Cummings Street	NBL	26.6	18.4	30.7	21.1	131	51	711	374
		NBT	31.6	21.5			131	51	711	374
		NBR	31.2	23.9			131	51	711	374
	I-81 NB Off-Ramp	EBL	33.9	27.1	29.2	21.5	101	78	617	467
		EBT	28.9	24.4			101	78	617	467
		EBR	3.6	1.7			103	80	623	473
	Cummings Street	SBL	16.5	11.4	7.0	7.2	19	41	248	404
		SBT	14.0	14.0			19	41	248	404
		SBR	0.0	0.1			0	0	72	75
	Intersection				23.1	14.4	-			
No Build (2054)	Country Club Drive	WBL	61.7	51.8	67.5	27.2	34	14	206	146
		WBT	62.8	48.8			34	14	206	146
		WBR	70.5	18.4			50	20	238	179
	Cummings Street	NBL	175.1	28.4	187.5	30.2	1,159	99	1,971	561
		NBT	188.5	31.1			1,159	99	1,971	561
		NBR	222.4	8.5			1,159	131	1,971	611
	I-81 NB Off-Ramp	EBL	83.4	36.3	77.4	30.7	340	117	1,175	632
		EBT	81.7	35.5			340	117	1,175	632
		EBR	39.6	5.4			344	120	1,181	638
	Cummings Street	SBL	31.6	16.5	25.1	9.7	97	69	549	600
		SBT	47.2	17.6			97	69	549	600
		SBR	5.2	0.5			1	1	101	145
	Intersection				95.9	20.3	-			

Table 14: Cook Street and Green Spring Road Intersection VISSIM Results – No-Build

Scenario	Approach	Lane Group	Movement Delay (sec)		Approach Delay (sec)		Average Queue (ft)		Maximum Queue (ft)	
			AM	PM	AM	PM	AM	PM	AM	PM
Existing	Cook Street	WBT	0.0	0.8	0.0	0.7	1	7	98	230
		WBR	0.0	0.0			0	4	9	143
	Cook Street	EBL	0.9	3.6	0.3	0.7	3	6	79	103
		EBT	0.0	0.0			0	1	39	67
	Green Spring Road	SBL	1.8	4.0	0.4	0.8	0	1	48	58
		SBR	0.2	0.4			0	0	37	46
	Intersection				0.2	0.7	-			
No-Build (2054)	Cook Street	WBT	1.9	20.4	1.8	19.9	10	129	186	568
		WBR	1.2	12.1			7	102	97	480
	Cook Street	EBL	1.7	6.7	0.5	1.7	5	14	124	175
		EBT	0.0	0.0			1	6	88	139
	Green Spring Road	SBL	3.2	14.1	1.0	6.3	1	2	79	85
		SBR	0.8	5.9			1	1	60	65
	Intersection				1.0	9.2	-			

1.7 Phase 1 Alternatives Development

VHB, in partnership with the SWG, developed preliminary alternatives in parallel with the high-level needs diagnosis efforts documented in **Chapter 1.5**. The proposed Phase 1 alternatives were developed to meet the following criteria:

- Improve operations at intersections in the study area
- Mitigate safety issues for the turning movements along Cummings Street
- Access management along Cummings Street
- Address queueing and congestion concerns
- Pedestrian accessibility

1.7.1 Initial Alternatives

The needs evaluation, diagnosis, and initial alternatives were presented in SWG Meeting #3, held on July 30, 2025. The SWG Meeting #3 was hosted on Mural, an online platform.² 16 alternatives for the study area along ALT US 58 (Cummings Street) were presented during the meeting, which are summarized in **Table 15**.

² Initial Alternatives Study Work Group Presentation:

<https://app.mural.co/t/vhbipd8103/m/vhbipd8103/1752859741747/f7aa0c48c333b37bb06028fc9e58698b41968edc>

Table 15: Phase 1 Alternatives

Section/Intersection	Alternative	Description
ALT US 58 (Cummings Street) and Bradley Street	Crosswalk Improvements	Add a pedestrian refuge island on Cummings Street
ALT US 58 (Cummings Street) between Bradley Street and Cook Street	Access Management Concept #1	Relocate left and right turn movements to and from the side streets and driveways along ALT US 58 (Cummings Street) by: • Allow southbound left into bank driveway (across Grove Terrace Drive) • Allow westbound left out of Mont Calm • Full access at shopping center driveway • Right-in/right-out only at southern shopping center driveway
	Access Management Concept #2	Relocate left and right turn movements to and from the side streets and driveways along ALT US 58 (Cummings Street) by: • Allow westbound left out of the bank driveway (across Grove Terrace Drive) • Allow southbound left into Mont Calm • Full access at shopping center driveway • Right-in/right-out only at southern shopping center driveway
	Access Management Concept #3	Relocate left movements to and from the side streets and driveways along ALT US 58 (Cummings Street) by: • Allow southbound left into bank driveway (across Grove Terrace Drive) • Allow westbound left out of Mont Calm • Allow southbound left into shopping center driveway • Allow westbound left out southern shopping center driveway
ALT US 58 (Cummings Street) and Cook Street*	Signal Phasing Changes	Implements protected only phasing for Cummings Street left turn movements or time of day protected only phasing for these left turns
	Infrastructure Improvements	Adds a supplemental signal head for southbound traffic on Cummings Street, adds ITS solutions for queue detection and warning on southbound Cummings

Section/Intersection	Alternative	Description
		Street, and adds speed feedback sign on southbound ALT US 58 (Cummings Street)
	Intersection Geometry Modification	Add a second northbound left turn lane and a southbound right-turn lane
	Pedestrian Bridge	Add a pedestrian bridge on north leg of the intersection
ALT US 58 (Cummings Street) between Cook Street and I-81 Southbound Ramps	Access Management Concept #1	Adds a median on ALT US 58 (Cummings Street) to restrict left turn movements to and from the side streets and driveways along ALT US 58 (Cummings Street) by: • Allow northbound left into Towne Centre Drive • Connect Green Spring Road to the shopping center • New connection to Wendy's from Towne Centre Drive • Median opening at the north driveway of the Exxon
	Access Management Concept #2	Adds a median on ALT US 58 (Cummings Street) to restrict left turn movements to and from the side streets and driveways along ALT US 58 (Cummings Street) by: • Construct median on Cummings Street • Maintain right-in/right-out at Towne Centre Drive • New connection to Wendy's from Towne Centre Drive • Median opening at the north driveway of the Exxon
ALT US 58 (Cummings Street) and I-81 Southbound Ramps*	Lane Restriping	Restripe northbound and southbound approach to support 2 southbound through lanes. Restripe the westbound approach to a left turn and a shared left/right turn lane.
	Single Lane Roundabout	Construct single lane roundabout
	Single Lane Roundabout with Channelized SBR	Construct single lane roundabout with channelized southbound right
	Timing Optimization	Optimize signal timings
	Yield-control Channelized WBR Turning Movement	Install yield for westbound right and remove from signal phase

* Intersections that will be further evaluated in Phase 2

For SWG Meeting #3, the study team used the Virginia Junction Screening Tool (VJuST) to screen intersection and interchange alternatives based on impacts to traffic operations, pedestrian accommodations, safety, and cost. The VJuST results are summarized in **Section 1.7.2**.

Near-Term Safety Improvements

At the Cummings Street and Cook Street intersection, there were 51 total crashes including 25 injury crashes; eight (8) of these crashes were red-light running and nine (9) were southbound rear end crashes. Sight distance for both Cummings Street left turns and the southbound Cummings Street approach (to the signal heads) is limited due to roadway curvature and roadside hillside. A Synchro analysis indicates that conversion of the northbound left-turn movement to protected only phasing increase delay to 32.3 seconds in the AM peak hour and 55.0 seconds in the PM peak hour, both manageable conditions. A supplemental signal head for southbound Cummings Street could be added to the backside of the northbound Cummings Street signal mast arm to provide a signal display within the southbound approaching sightline. Flashing warning beacons could be added to the existing W3-3 (Signal Ahead) warning signs on southbound Cummings Street.

Pedestrian Alternatives

The SWG considered alternatives addressing pedestrian access in addition to concepts addressing vehicular operations and safety. The SWG analyzed alternatives aimed at improving pedestrian safety crossing ALT US 58 (Cummings Street). One alternative proposed to construct a pedestrian bridge across the northern leg of the ALT US 58 (Cummings Street) and Cook Street intersection to provide a safer option to cross the busy intersection by removing the conflict between pedestrians and vehicles. Another alternative proposed a pedestrian refuge island on the north leg of the ALT US 58 (Cummings Street) and Bradley Street intersection to give pedestrians who need more time to cross a safe place to wait. Both alternatives were selected for further analysis in Phase 2.

1.7.2 Phase 1 Alternatives Summary

The VJuST results are summarized for the ALT US 58 (Cummings St) and I-81 Southbound Ramps intersection in **Figure 34** and were presented at SWG Meeting #3, held on July 30, 2025, where it was decided which alternatives would move forward to Phase 2. In total, the SWG agreed to carry 12 alternatives forward to Phase 2 for further refinement, which include:

- Pedestrian refuge island at the ALT US 58 (Cummings Street) and Bradley Street intersection
- Four (4) access management concepts for ALT US 58 (Cummings Street) between Bradley Street and Cook Street
- Pedestrian bridge at the ALT US 58 (Cummings Street) and Cook Street intersection
- Additional turn lanes at the ALT US 58 (Cummings Street) and Cook Street intersection
- Two (2) access management concepts for ALT US 58 (Cummings Street) between Cook Street and the I-81 Southbound ramp
- Connecting Green Spring Road to the shopping center
- Restriping the I-81 southbound off-ramp to a left and shared left/right-turn
- Channelized westbound right-turn at the I-81 Southbound off-ramp

Intersection	Scenario	Maximum V/C		Weighted Total Conflict Points	Planning Level Cost Category
		AM	PM		
Cummings St and I-81 Southbound	Existing	0.76	0.81	48	\$
	2 SB thru lanes + 1 shared NBL/T lane	1.03	0.99	48	\$
	1 shared WB left/right turn lane + 1 right turn lane	0.67	0.61	48	\$
	Roundabout	0.82	0.99	8	\$\$
	Roundabout with SBR channelization	0.82	0.76	8	\$\$
	Channelized WBR	0.50	0.58	48	\$
Cummings St and Cook St	Existing	0.44	0.54	48	\$
	Additional NBL turn lane + 1 SBR turn lane	0.44	0.54	48	\$

Figure 34: VJuST Analysis Results

The SWG eliminated alternatives from Phase 1 for various constraints, including funding and viability constraints. The signal phasing changes and infrastructure improvements at the ALT US 58 (Cummings Street) and Cook Street intersection, and the timing optimization at ALT US 58 (Cummings Street) and I-81 Southbound Ramps were eliminated because there is a possible near-term alternative. Additionally, lane restriping of Cummings Street and the single lane roundabouts alternatives at ALT US 58 (Cummings Street) and I-81 Southbound Ramps were eliminated. The lane restriping alternative did not move forward because it did not appear viable between VJuST results and pre- Exit 17 northbound ramps interchange project operational performance. Single Lane Roundabout and Single Lane Roundabout with Channelized SBR were eliminated due to operational viability and proximity to the northbound ramp terminus signalized intersection. The alternatives that moved forward were all carried forward because of the safety and traffic operations benefits.

Table 16 summarizes the alternatives considered in Phase 1 and gives the justification of whether a concept were to move forward to Phase 2. **Figure 35** shows the preliminary alternatives graphically categorized by the needs addressed by the alternative.

Table 16: Phase 1 Alternatives to Move Forward to Phase 2

Section/Intersection	Alternative	Move Forward to Phase 2?	Justification
ALT US 58 (Cummings Street) at Bradley Street	Crosswalk Improvements	Yes	Low-cost safety improvement
ALT US 58 (Cummings Street) between Bradley Street and Cook Street	Access Management Alternative Options	Yes, with Modifications	Safety and traffic operations improvement. The SWG will analyze different left turn restriction configurations in Phase 2 to develop modified concept(s)
ALT US 58 (Cummings Street) and Cook Street*	Signal Phasing Changes	No	Possible near-term alternative; therefore, no need for SMART SCALE funding
	Supplement Signal Head / Warning Devices	No	Possible near-term alternative; therefore, no need for SMART SCALE funding
	Intersection Geometry Modification	Yes, with Modifications	Safety and traffic operations improvement. The SWG will analyze further in Phase 2 once traffic pattern changes associated with the French Moore Boulevard and Cook Street extension project has been projected.
	Pedestrian Bridge	Yes	Safety and traffic operations improvement
ALT US 58 (Cummings Street) between Cook Street and I-81 Southbound Ramps	Access Management Alternative Options	Yes	Safety and traffic operations improvement
ALT US 58 (Cummings Street) and I-81 Southbound Ramps*	Lane Restriping	Yes	Changes to southbound Cummings St does not appear viable between VJuST results and pre-interchange project operational performance. Westbound approach at off-ramp will be analyzed further in Phase 2, projected operations improvement in VJuST.
	Single Lane Roundabout	No	Detailed operations analysis is needed to determine viability
	Single Lane Roundabout with Channelized SBR	No	Detailed operations analysis is needed to determine viability

Section/Intersection	Alternative	Move Forward to Phase 2?	Justification
	Timing Optimization	No	Possible near-term alternative; therefore, no need for SMART SCALE funding
	Yield-control Channelized WBR Turning Movement	Yes, with Modifications	Safety and traffic operations improvement. The SWG will analyze further in Phase 2 once traffic pattern changes associated with the French Moore Boulevard and Cook Street extension project has been projected.

* Intersections that will be further evaluated in Phase 2



Operations Improvements	Safety Improvements
① Capacity improvements to accommodate traffic patterns of Cook St / French Moore Blvd ② Green Spring Rd extension to Shopping Center / Hampton Inn ③ Channelize southbound I-81 off-ramp right turns	① Access management strategies Bradley St to Cook St ② Protected northbound left turn signal phase ③ Mitigate southbound signal head limited sight distance ④ Access management strategies Cook St to I-81
Pedestrian Improvements	Transit/TDM Improvements
① Enhanced crosswalk treatment at Bradley Street	① Transit access

Figure 35: Phase 1 Scoping Level Improvement Alternatives

Chapter 2: Alternatives Refinement

2.1 Alternatives Refinement Overview

VHB further developed the alternatives chosen to be 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 present feasible alternatives to the public to obtain feedback and ultimately select a preferred alternative. VHB evaluated alternatives across several metrics, including traffic operations, safety, pedestrian and bicycle access, and cost. Additional attributes, such as feedback from the SWG and the results of the VISSIM analysis, were used to further refine the alternatives.

SWG Meeting #4/5 was held on February 5th, 2026. VHB presented revised concept sketches, cost estimates, and concept screening results to receive feedback from the SWG. The SWG analyzed the alternatives based on impacts to safety, traffic operations, cost, and right-of-way. The meeting concluded with the SWG selecting the concepts to be shared during public outreach. The SWG Meeting #4/5 presentation was hosted on Mural, an online platform.³

2.2 Phase 2 Alternatives Description

The SWG advanced 11 alternatives in Phase 2, a pedestrian refuge island at Bradley Street, access management concepts for ALT US 58 (Cummings Street) between Bradley Street and Cook Street, a pedestrian bridge at ALT US 58 (Cummings Street) and Cook Street, intersection geometry modification concepts at ALT US 58 (Cummings Street) and Cook Street, access management concepts for ALT US 58 (Cummings Street) between Cook Street and I-81 Southbound Ramps, and Exit 17 ramp improvement concepts at ALT US 58 (Cummings Street) and I-81 Southbound Ramps. The following section includes a description, a conceptual sketch, screening-level traffic operations analysis, and safety analysis for all alternatives.

³ Detailed Alternatives Study Work Group Presentation:
<https://app.mural.co/t/vhbipd8103/m/vhbipd8103/1769539057971/6830f82fbf99d68c692ad4d318019470c88a0cbf>

Pedestrian Refuge Island at Bradley Street

The pedestrian refuge island alternative would add a pedestrian refuge island on the north leg of the ALT US 58 (Cummings Street) and Bradley Street intersection. Additionally, the alternative would extend the funded roadway project on ALT US 58 (Cummings Street) that reconfigures southbound Cummings Street to one travel lane. The funded project's extents are currently ALT US 58 (Cummings Street) between Route 11 and Remsburg Drive. The alternative would extend the funded roadway project on ALT US 58 (Cummings Street) to Bradley Street to narrow the pedestrian crossing. The alternative would also add signage to properly warn all road users of pedestrian traffic, which includes two Pedestrian Crossing signs (W11-2) located 250 feet in advance of the crosswalk on both northbound and southbound ALT US 58 (Cummings Street) and a Keep Right (R4-7) sign for the new pedestrian refuge island. The alternative would enhance pedestrian safety by reducing the number of travel lanes needed to cross Cummings Street, introduce a two-stage crossing via the refuge island, and warn drivers of pedestrian traffic. The SWG identified this intersection within the area where pedestrian traffic is more present as documented in **Chapter 1.5.1**. **Figure 36** presents a conceptual sketch of the alternative.

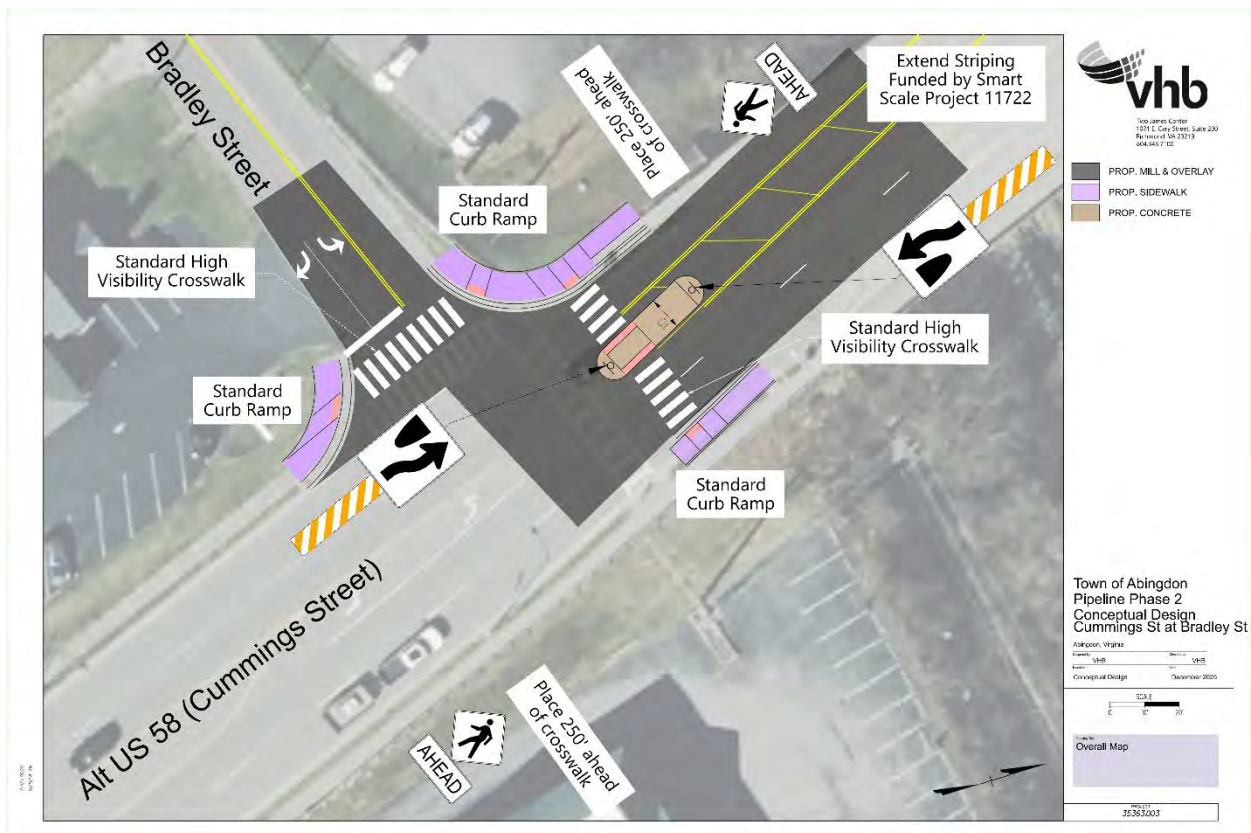


Figure 36: Phase 2 Alternative— Pedestrian Refuge Island at Bradley Street

Access Management Concepts for ALT US 58 (Cummings Street) between Bradley Street and Cook Street

In partnership with the SWG, VHB developed four access management concepts on ALT US 58 (Cummings Street) between Bradley Street and Cook Street. The concepts propose a median to restrict left turn movements to and from the side streets and driveways along ALT US 58 (Cummings Street). The

proposed access management concepts consolidate turning movements and mitigate crash risk. 12 angle crashes associated with the driveways occurred from 2020 to 2024 on this section of ALT US 58 (Cummings Street), one crash resulted in a Severe Injury (A). Restricting left turn movements would mitigate conflict points between vehicles.

The median would be constructed in place of the existing two-way left turn lane. Each access management concept proposes select left turns to consolidate and restrict. While the proposed concepts alter existing traffic patterns, there would be minimal rerouting. The existing northbound and southbound through lanes and curb and gutter would be maintained. The SWG informed the study team that Abingdon Olive Oil Company is routinely frequented by tour buses that stop to and from downtown Abingdon.

Northern Access Management Concept #1

The first access management concept proposes left turn movements in and out at the central shopping center driveway and restricts all left turn movements at the southern driveway. The concept would not provide left turn movements for the Abingdon Olive Oil Company. Vehicles that need to turn left in or out of the Abingdon Olive Oil Company would need to make a U-turn to complete their desired movement. All other left turns would be consolidated at the central shopping center driveway and at Mont Calm. This first concept is shown in **Figure 37**.



Figure 37: Phase 2 Alternative—Northern Access Management Concept #1

Northern Access Management Concept #2

The second access management concept would provide left turn movements into the central shopping center driveway while restricting left turn movements out. In addition to the central shopping center driveway, vehicles entering the shopping center from the north would be able to turn left at Mont Calm. Vehicles exiting the shopping center would make a left turn out at the southern shopping center driveway; however, left turns into the shopping center would be restricted at this driveway. In addition to the southern shopping center driveway, vehicles leaving the shopping center to travel south would be able to make a left turn movement from Mont Calm. The concept would not provide left turn movements for the Abingdon Olive Oil Company. Vehicles needing a left turn movement in or out of the Abingdon Olive Oil Company would need to make a U-turn to complete their desired movement. This concept is shown in **Figure 38**.



Figure 38: Phase 2 Alternative— Northern Access Management Concept #2

Northern Access Management Concept #3

The third access management concept proposes left turn movements into the shopping center at Mont Calm and restricts the left turn movements into the shopping center at both the central and southern shopping center driveways. Vehicles exiting the shopping center would be able to make a left turn movement out of the shopping center at the central shopping center driveway. This concept would restrict all left turn movements at the southern shopping center driveway. Vehicles would be able to turn left into the Abingdon Olive Oil Company at both driveways; however, left turn movements out would be prohibited. In this access management concept, the vehicle leaving the Abingdon Olive Oil company to travel north would need to make a U-turn to complete their desired movement. Vehicles entering the shopping center

from the north would turn left in at Mont Calm and the vehicles traveling south from the shopping center would make lefts out from the central shopping center driveway or from Mont Calm. The third access management concept is shown in **Figure 39**.



Figure 39: Phase 2 Alternative— Northern Access Management Concept #3

Northern Access Management Concept #4

The fourth access management concept is similar to the second access management concept. The primary difference is the turning movement permitted at the Abingdon Olive Oil Company driveway. The concept would provide left turn movements into the central shopping center, while restricting left turn movements out. In addition to the central shopping center driveway, vehicles entering the shopping center from the north would be able to turn left at Mont Calm. Vehicles exiting the shopping center would make a left turn out of the southern shopping center driveway; vehicles making left turn movement in would be restricted at this driveway. In addition to the southern shopping center driveway, vehicles leaving the shopping center to travel south would be able to make a left turn movement from Mont Calm. Left turn movements in the shopping center would be allowed at Grove Terrace Drive. Left turn movements in would be restricted at the Abingdon Olive Oil Company driveway, while left turn movements out of the driveway would be permitted. Vehicles making a left turn movement out of the Abingdon Olive Oil Company would need to make a U-turn to complete their desired movement. This concept is shown in **Figure 40**.



Figure 40: Phase 2 Alternative— Northern Access Management Concept #4

Pedestrian Bridge at ALT US 58 (Cummings Street) and Cook Street Intersection

The pedestrian bridge concept proposes a pedestrian bridge above ALT US 58 (Cummings Street) on the north leg of the ALT US 58 (Cummings Street) and Cook Street intersection to improve the safety of the pedestrians crossing Cummings Street. The bridge would connect to Veterans Memorial Park on the west side of ALT US 58 (Cummings Street) and to Cook Street on the east. This concept is shown in **Figure 41**.

The pedestrian bridge was conceptually designed with 21 feet of overhead clearance on Cummings Street. If this alternative were to move forward, more detailed design would need to consider sight distance for southbound traffic on Cummings Street to the traffic signal display. As shown in Figure 41, due to the topography on Cook Street falling away from Cummings Street, the proposed pedestrian bridge must chase grade for several hundred feet east on Cook Street, even with a switchback and a maximum allowable gradient. As such, this conceptual design would service east-west pedestrian traffic along Cook Street but would be challenging for pedestrian traffic along Cummings Street to access. The SWG discussed potential solutions, including stair and/or elevator access at the ends of the bridge.

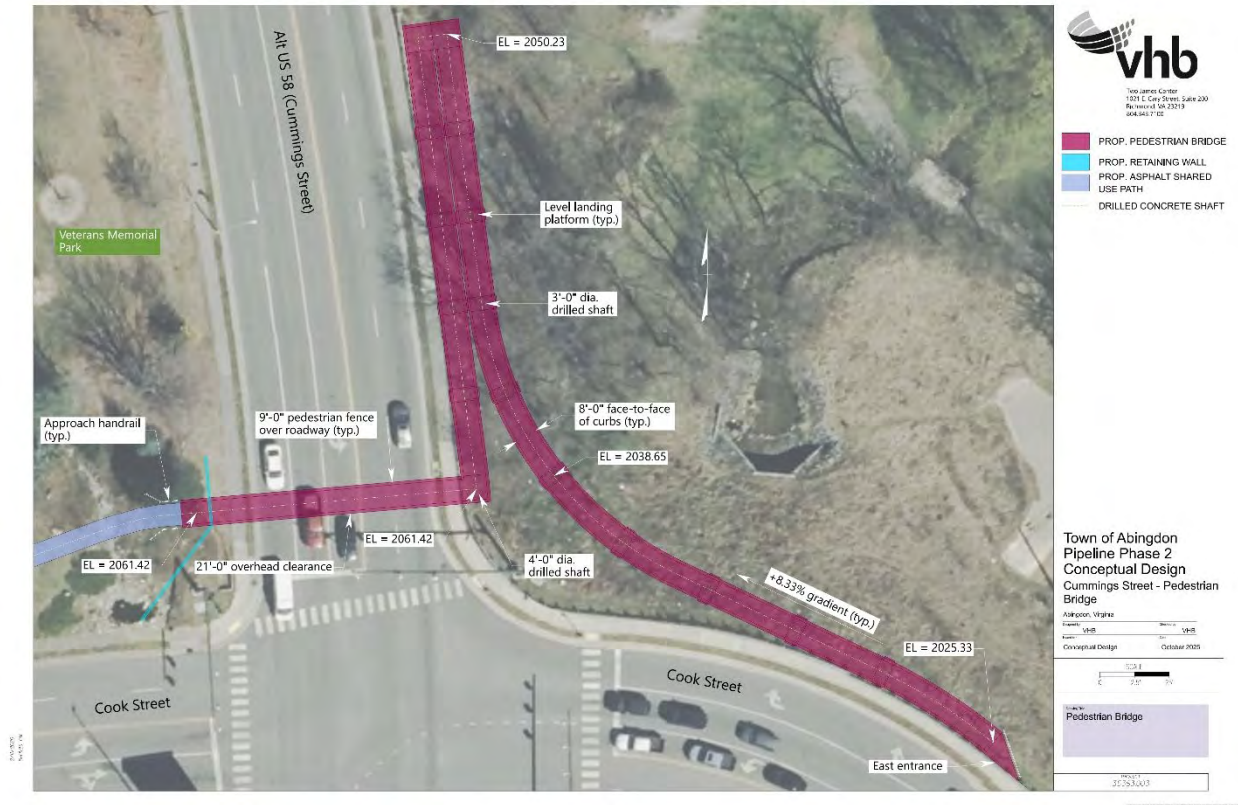


Figure 41: Phase 2 Alternative— Pedestrian Bridge

Intersection Geometry Modification at ALT US 58 (Cummings Street) and Cook Street Intersection

The intersection geometry modification alternative would construct a second northbound left turn lane from ALT US 58 (Cummings Street) onto westbound Cook Street and a southbound right turn lane from ALT US 58 (Cummings Street) onto westbound Cook Street. Additionally, the concept would widen both the north and south approaches of ALT US 58 (Cummings Street) to support the additional turn lanes. The additional lanes and widened road would support the projected increase in volume for these two turning movements upon the completion of the Cook Street and French Moore Boulevard extension project. **Figure 42** shows this proposed alternative concept.

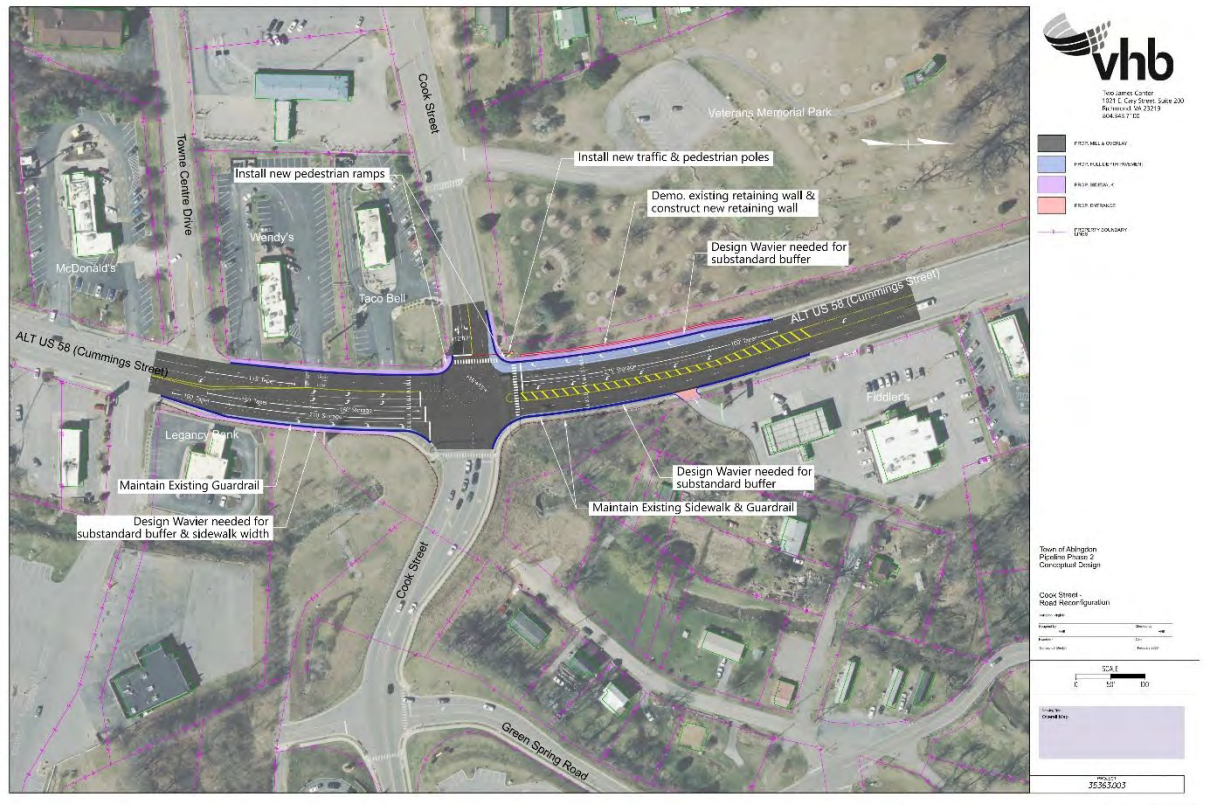


Figure 42: Phase 2 Alternative— Intersection Geometry Modifications

Access Management Concepts for ALT US 58 (Cummings Street) between Cook Street and I-81 Southbound Ramps

In partnership with the SWG, VHB developed two access management concepts for ALT US 58 (Cummings Street) between Cook Street and I-81 Southbound ramps. The access management concepts propose a median to restrict left turn movements to and from the side streets and driveways along Cummings Street. The proposed access management concepts consolidate turning movements and mitigate crash risk. 35 angle crashes associated with driveways and/or side streets occurred from 2020 to 2024 on this section of Cummings Street. Restricting left turns would mitigate conflict points between vehicles.

The median would be constructed in the space of the existing two-way left turn lane. Each access management concept proposes select left turns to consolidate and restrict. Existing traffic patterns would change considerably with either proposed access management as many of the direct left turns would be restricted; however, new connections are proposed to decrease the need for U-turns to complete movements.

Southern Access Management Concept #1

The first access management concept would provide left turn movements into Towne Centre Drive while restricting all other left turn movements along ALT US 58 (Cummings Street) between Cook Street and I-81 Southbound ramps through a raised median. This concept proposes extending Green Spring Road from Cook Street to the Hampton Inn Shopping Center to provide left turn access from the traffic signal at the ALT US 58 (Cummings Street) and Cook Street intersection. It would also construct a new driveway from Towne Centre Drive into Wendy's to facilitate replacement access from northbound Cummings Street. Although many of the direct left turn movements are restricted in this proposed concept, all properties except for Exxon and Hardee's would have left turn access to ALT US 58 (Cummings Street) either from Towne Centre Drive or from Cook Street. This concept can be seen in **Figure 43**.

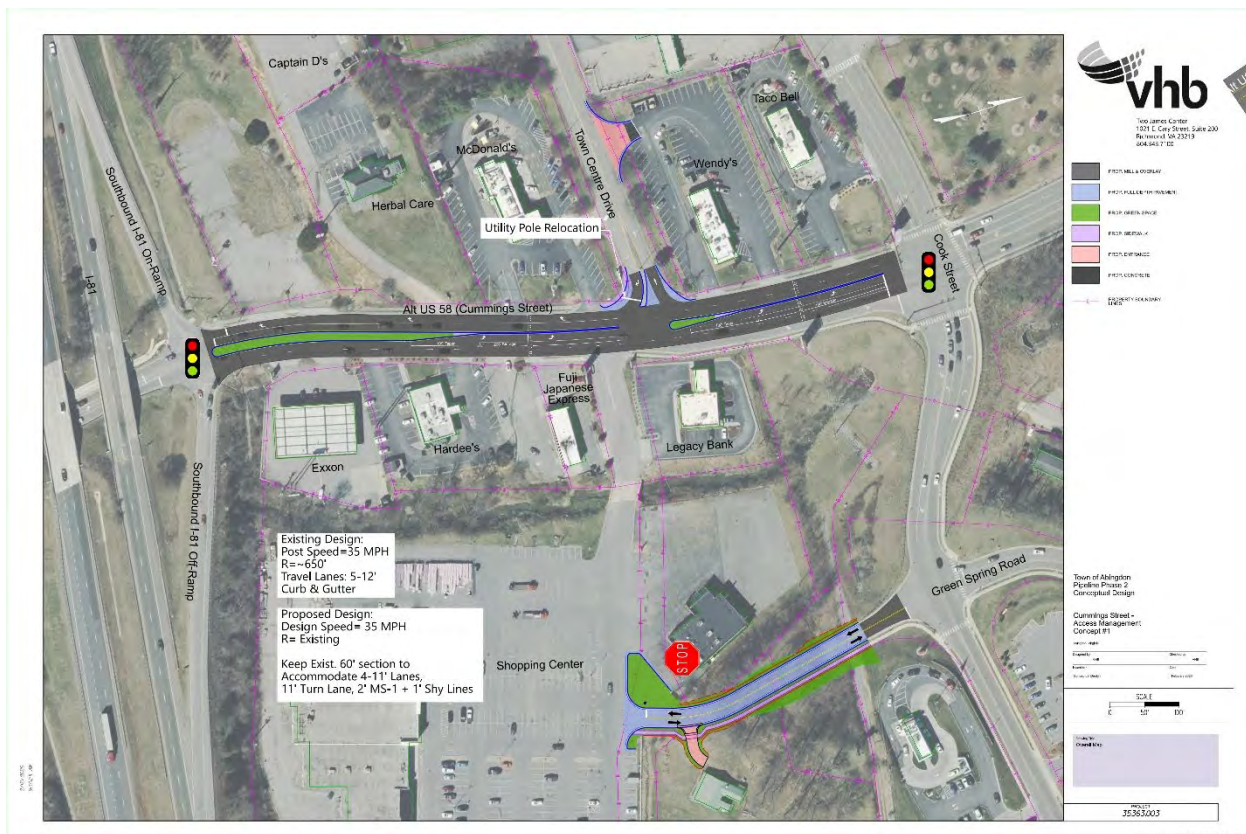


Figure 43: Phase 2 Alternative— Southern Access Management Concept #1

Southern Access Management Concept #2

The second access management concept would provide left turn movements into McDonald's and left turn movements into and out from the Hampton Inn Shopping Center. All other left turn movements along ALT US 58 (Cummings Street) between Cook Street and I-81 Southbound ramps would be restricted through a raised median. While many left turn movements would be restricted, all properties, except Exxon and Hardee's, would have left turn access to ALT US 58 (Cummings Street) either from a median opening or from Cook Street. This concept can be seen in **Figure 44**.



The SWG concluded during Phase 2 that there was a need for an alternative at the Exit 17 ramps to address safety and operations concerns. The SWG noted the existing and No-Build queue back up on the southbound off-ramp. The queue extends to the gore of the off ramp during existing peak conditions and will extend onto the I-81 southbound mainline as traffic volumes increase as documented in **Chapter 1.6.1**. The presence of a queue on an interstate mainline creates safety issues such as drivers encountering an unexpected speed differential and drivers becoming more likely to undertake risky maneuvers such as a last-minute lane change to avoid the queue. VHB developed two initial concepts to improve operations and mitigate queue lengths on the southbound off-ramp approach. The two concepts increase vehicular throughput capacity and decrease queue spillback onto I-81.



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be widened to six lanes at this interchange, which would introduce an opportunity for a more wholesale interchange reconfiguration.

There is a large box culvert structure that carries Town Creek underneath I-81; this structure passes beneath the southbound off-ramp approximately 200 feet upstream of the Cummings Street intersection stop bars. Construction to the north of the I-81 southbound off-ramp would likely affect this structure, which would have environmental ramifications as well as significant costs.

Exit 17 Ramp Improvement Concept #1 - Channelization

The first concept would add a channelized right turn lane, converting the southbound off-ramp right turn from signal control to a free-flow movement. The alternative would redistribute the regained green time to the other interchange movements since the right turn movement – 540 VPH (2054 AM) and 497 VPH (2054 PM) – is removed from signal control. Preliminary concept design for this alternative included full property acquisition of the Exxon gas station to remove driveways from the functional intersection vicinity. The proposed channelized turn lane would be received by the outside travel lane on northbound Cummings Street. **Figure 45** shows this concept.

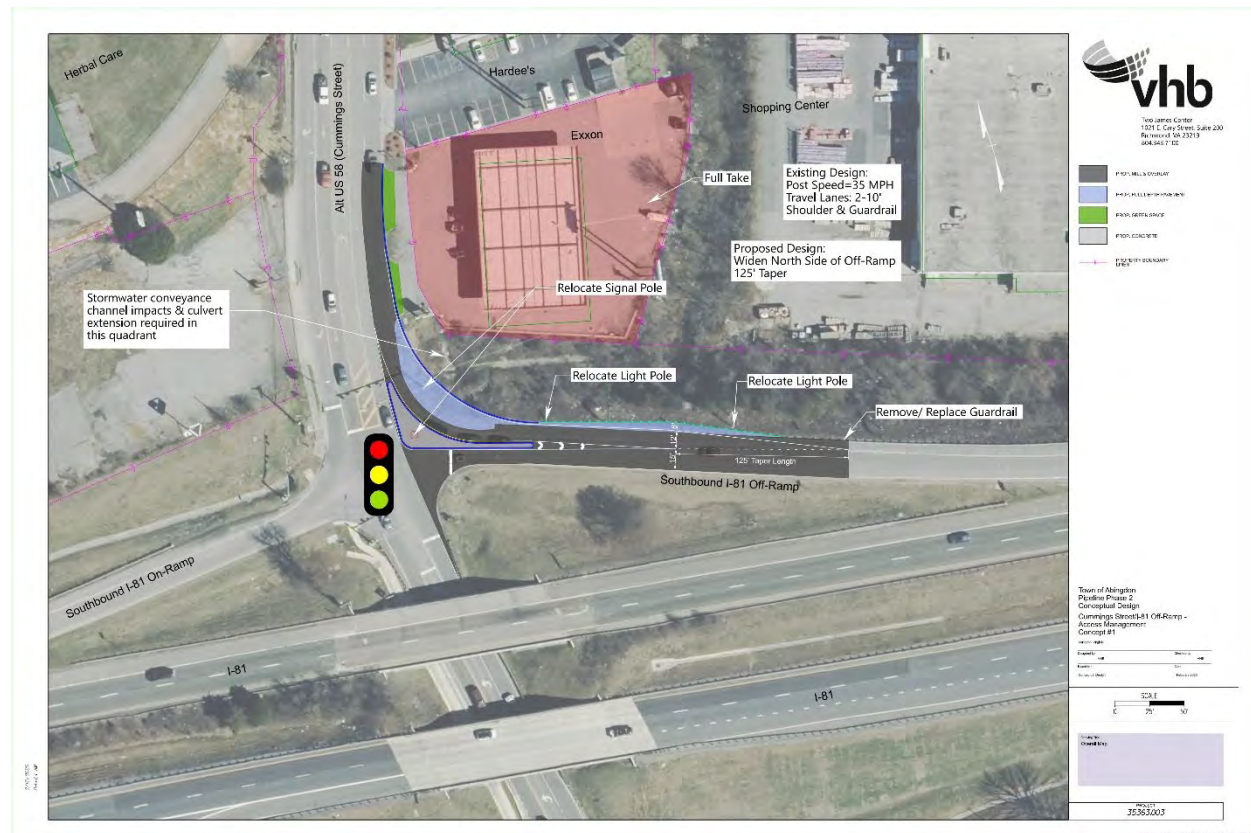


Figure 45: Phase 2 Alternative—Ramp Improvement Concept #1 - Channelization

Exit 17 Ramp Improvements Concept #2 – Ramp Restriping

The second concept proposes to convert the existing southbound off-ramp to a shared left and right turn lane plus a dedicated right turn lane. This would result in two lanes of right turn capacity onto northbound Cummings Street. The concept would redistribute the regained green time to other interchange movements. This concept fits within the public right-of-way. **Figure 46** shows this concept.



Figure 46: Phase 2 Alternative—Ramp Improvement Concept #2

2.3 Traffic Operations and Safety Results

The study team conducted VISSIM analysis for the alternatives that involved intersection geometry modifications – intersection operations were evaluated to compare projected operations between the different alternatives in both the AM and PM peak hours for the future (2054) year. Control delay (seconds per vehicle), and average and maximum queue length (feet) were used as measures of effectiveness. The results of the Build scenarios are presented below.

Anticipated Traffic Operations Results for Alternatives

The VISSIM analysis was performed further along in the Phase 2 alternatives refinement process and therefore the analyzed alternatives were modified from what was presented to the stakeholders and in the public engagement survey. These modifications were based on the feedback and discussion between the study team and the SWG. Any modifications to an alternative is explained within the following sections.

Intersection Geometry Modification at ALT US 58 (Cummings Street)

With the addition of the second northbound left turn lane and the southbound right turn lane the ALT US 58 (Cummings Street) and Cook Street intersection is expected to have an overall delay of 19.0 and 30.2 seconds in the AM and PM peak hour respectively. The northbound approach delay and queue lengths are expected to increase with the second left turn lane due to the signal phasing change from protected-permissive to protected only. All other approaches are expected to have a decrease in delay and queue lengths. The analysis results for this alternative can be seen compared No-Build and Build conditions in **Table 17**.

Table 17: ALT US 58 (Cummings Street) and Cook Street Intersection VISSIM Results – Intersection Geometry Modification

Scenario	Approach	Lane Group	Movement Delay (sec)		Approach Delay (sec)		Average Queue (ft)		Maximum Queue (ft)	
			AM	PM	AM	PM	AM	PM	AM	PM
No-Build (2054)	Cook Street	WBL	32.6	58.8	32.7	42.3	60	137	316	413
		WBT	36.0	61.3			60	137	316	413
		WBR	30.8	9.3			60	137	316	413
	Cummings Street	NBL	10.6	24.7	9.3	17.6	44	71	231	295
		NBT	14.6	28.5			44	71	231	295
		NBR	0.9	1.6			41	72	244	308
	Cook Street	EBL	35.8	41.1	45.9	58.2	61	81	306	332
		EBT	62.4	82.3			61	81	306	332
		EBR	35.5	54.8			59	80	310	335
	Cummings Street	SBL	9.3	32.2	19.4	42.6	63	254	277	930
		SBT	20.2	46.5			63	254	277	930
		SBR	25.1	40.1			63	258	277	937
	Intersection				18.7	34.6	-			
Geometry Modification (2054)	Cook Street	WBL	31.8	40.3	25.6	28.3	54	97	294	801
		WBT	33.5	42.4			54	97	294	801
		WBR	1.8	3.5			54	97	294	801
	Cummings Street	NBL	32.7	44.5	14.1	31.1	67	137	308	522
		NBT	15.4	30.6			67	137	308	522
		NBR	0.8	26.7			52	149	318	538
	Cook Street	EBL	35.6	38.3	42.4	46.0	55	125	279	470
		EBT	56.8	58.1			55	125	279	470
		EBR	31.2	43.4			53	127	282	473
	Cummings Street	SBL	8.6	29.4	16.8	23.9	38	103	216	455
		SBT	18.8	22.7			38	103	216	455
		SBR	17.5	20.2			37	97	216	455
	Intersection				19.0	30.2	-			

Access Management Concepts for ALT US 58 (Cummings Street) between Cook Street and I-81 Southbound Ramps

The following VISSIM analyses for the access management concepts reflect the rerouted volumes due to the left turn restrictions and any other geometric modifications associated with the access management concepts. This concept also was modified to include the Green Spring Road extension in both concepts, as well as the left in allowed at Towne Centre Drive. The difference between the two concepts is at the Green

Spring Road and Cook Street intersection control. The first concept evaluated this intersection under signal control, and the second concept evaluated the intersection under stop control.

Access Management Concept with Green Spring Road Extension Signal-Controlled

The addition of the median to restrict left turn movements along the ALT US 58 (Cummings Street) corridor and the Green Spring Road extension with signal control at the Cook Street and Green Spring Road intersection affects two intersections within the study area, the ALT US 58 (Cummings Street) and Cook Street intersection and the Cook Street and Green Spring Road intersection. The ALT US 58 (Cummings Street) and Cook Street intersection is expected to have an overall delay of 31.3 and 30.3 seconds in the AM and PM peak hour, respectively. The analysis results for this alternative can be seen comparing No-Build and Build conditions in **Table 18**.

The Cook Street and Green Springs Road intersection is expected to have an overall delay of 9.4 and 22.8 seconds in the AM and PM peak hour respectively. In this alternative this intersection is signalized, and the northbound and westbound approaches are expected to have higher delays and longer queue lengths. The northbound approach has the highest delays and queue lengths compared to the No-Build conditions due to the new approach and rerouted traffic making a left at this intersection. The westbound approach has increased delay due to signal control. The analysis results for this alternative can be seen comparing No-Build and Build conditions in **Table 19**.

Access Management Concept with Green Spring Road Extension Stop-Controlled

The ALT US 58 (Cummings Street) and Cook Street intersection is expected to have an overall delay of 20.6 and 29.8 seconds in the AM and PM peak hour, respectively. Delay and queuing on westbound Cook Street is significantly less than in the Green Spring Road signalization concept due to the removal of the tightly coordinated signal system between Cummings Street and Green Spring Road. The analysis results for this alternative can be seen comparing No-Build and Build conditions in **Table 20**. These findings indicate that the rerouting associated with the Cummings Street access management concept can be accommodated by the Cummings Street / Cook Street intersection.

The Cook Street and Green Springs Road intersection is expected to have an overall delay of 1.1 and 25.3 seconds in the AM and PM peak hour, respectively. In this alternative this intersection is two-way stop-controlled, and the northbound and southbound approaches are expected to have higher delays and longer queue lengths. The new northbound Green Spring Road approach has 11.5 seconds of delay in the AM peak hour but over 350 seconds of delay in the PM peak hour. In the PM peak, when westbound Cook Street has heavy volume demand out to Cummings Street, there are very few available gaps in traffic for northbound left turn traffic to complete their turn. The analysis results for this alternative can be seen comparing No-Build and Build conditions in **Table 21**.

Table 18: ALT US 58 (Cummings Street) and Cook Street Intersection VISSIM Results – Access Management Concept with Green Spring Road Extension Signal-Controlled

Scenario	Approach	Lane Group	Movement Delay (sec)		Approach Delay (sec)		Average Queue (ft)		Maximum Queue (ft)	
			AM	PM	AM	PM	AM	PM	AM	PM
No-Build (2054)	Cook Street	WBL	32.6	58.8	32.7	42.3	60	137	316	413
		WBT	36.0	61.3			60	137	316	413
		WBR	30.8	9.3			60	137	316	413
	Cummings Street	NBL	10.6	24.7	9.3	17.6	44	71	231	295
		NBT	14.6	28.5			44	71	231	295
		NBR	0.9	1.6			41	72	244	308
	Cook Street	EBL	35.8	41.1	45.9	58.2	61	81	306	332
		EBT	62.4	82.3			61	81	306	332
		EBR	35.5	54.8			59	80	310	335
	Cummings Street	SBL	9.3	32.2	19.4	42.6	63	254	277	930
		SBT	20.2	46.5			63	254	277	930
		SBR	25.1	40.1			63	258	277	937
	Intersection				18.7	34.6	-			
Access Management Concept #1 (2054)	Cook Street	WBL	40.4	50.1	34.2	39.5	83	208	379	1,551
		WBT	44.7	51.8			83	208	379	1,551
		WBR	4.7	10.4			83	208	379	1,551
	Cummings Street	NBL	43.5	52.0	21.4	19.4	102	84	440	285
		NBT	26.2	24.2			102	84	440	285
		NBR	1.5	1.6			91	79	453	298
	Cook Street	EBL	48.2	41.6	55.2	54.0	79	162	329	567
		EBT	70.0	71.6			79	162	329	567
		EBR	48.6	54.6			78	163	332	571
	Cummings Street	SBL	22.9	20.2	38.4	24.6	95	115	397	536
		SBT	45.2	26.6			95	115	397	536
		SBR	34.6	22.7			100	118	404	542
	Intersection				31.1	30.3	-			

Table 19: Cook Street and Green Spring Road Intersection VISSIM Results – Access Management Concept with Green Spring Road Extension Signal-Controlled

Scenario	Approach	Lane Group	Movement Delay (sec)		Approach Delay (sec)		Average Queue (ft)		Maximum Queue (ft)	
			AM	PM	AM	PM	AM	PM	AM	PM
No-Build (2054)	Cook Street	WBL	0.0	0.0	1.8	19.9	7	103	101	484
		WBT	1.9	20.4			10	129	186	568
		WBR	1.2	12.1			7	102	97	480
	Future Green Spring Road Extension	NBL	0.0	0.0	0.0	0.0	0	0	0	0
		NBT	0.0	0.0			0	0	0	0
		NBR	0.0	0.0			0	0	0	0
	Cook Street	EBL	1.7	6.7	0.5	1.7	5	14	124	175
		EBT	0.0	0.0			1	6	88	139
		EBR	0.0	0.0			1	6	88	139
	Green Spring Road	SBL	3.2	14.1	1.0	6.3	1	2	79	85
		SBT	0.0	0.0			1	2	82	87
		SBR	0.8	5.9			1	1	60	65
	Intersection				1.0	9.2	-			
Access Management Concept #1 (2054)	Cook Street	WBL	0.0	0.0	14.9	38.1	45	245	313	1,092
		WBT	15.2	38.6			45	245	313	1,092
		WBR	11.3	31.6			43	242	308	1,089
	Green Spring Road Extension	NBL	50.5	56.7	50.5	56.7	22	51	120	242
		NBT	0.0	0.0			22	51	120	242
		NBR	0.0	0.0			22	51	120	242
	Cook Street	EBL	3.5	10.4	2.2	6.8	9	39	214	387
		EBT	1.6	5.7			9	39	214	387
		EBR	1.2	4.7			9	36	214	380
	Green Spring Road	SBL	62.8	59.4	6.9	26.8	3	7	57	94
		SBT	0.0	0.0			1	7	77	94
		SBR	2.4	24.6			1	6	59	94
	Intersection				9.4	22.8	-			

Table 20: ALT US 58 (Cummings Street) and Cook Street Intersection VISSIM Results – Access Management Concept with Green Spring Road Extension Stop-Controlled

Scenario	Approach	Lane Group	Movement Delay (sec)		Approach Delay (sec)		Average Queue (ft)		Maximum Queue (ft)	
			AM	PM	AM	PM	AM	PM	AM	PM
No-Build (2054)	Cook Street	WBL	32.6	58.8	32.7	42.3	60	137	316	413
		WBT	36.0	61.3			60	137	316	413
		WBR	30.8	9.3			60	137	316	413
	Cummings Street	NBL	10.6	24.7	9.3	17.6	44	71	231	295
		NBT	14.6	28.5			44	71	231	295
		NBR	0.9	1.6			41	72	244	308
	Cook Street	EBL	35.8	41.1	45.9	58.2	61	81	306	332
		EBT	62.4	82.3			61	81	306	332
		EBR	35.5	54.8			59	80	310	335
	Cummings Street	SBL	9.3	32.2	19.4	42.6	63	254	277	930
		SBT	20.2	46.5			63	254	277	930
		SBR	25.1	40.1			63	258	277	937
	Intersection				18.7	34.6	-			
Access Management Concept #2 (2054)	Cook Street	WBL	35.5	49.5	29.0	38.6	65	166	362	1096
		WBT	34.9	51.3			65	166	362	1096
		WBR	1.5	8.9			65	166	362	1096
	Cummings Street	NBL	33.7	51.6	14.6	19.5	77	84	352	304
		NBT	15.8	25.1			77	84	352	304
		NBR	1.3	1.0			63	80	365	317
	Cook Street	EBL	40.0	39.5	38.7	53.0	52	161	259	571
		EBT	47.1	70.5			52	161	259	571
		EBR	25.8	55.8			50	162	263	575
	Cummings Street	SBL	9.8	19.2	19.0	24.0	50	111	256	523
		SBT	23.5	26.1			50	111	256	523
		SBR	15.5	22.9			54	114	263	530
	Intersection				20.6	29.8	-			

Table 21: Cook Street and Green Springs Road Intersection VISSIM Results – Access Management Concept with Green Spring Road Extension Stop-Controlled

Scenario	Approach	Lane Group	Movement Delay (sec)		Approach Delay (sec)		Average Queue (ft)		Maximum Queue (ft)	
			AM	PM	AM	PM	AM	PM	AM	PM
No Build (2054)	Cook Street	WBL	0.0	0.0	1.8	19.9	7	103	101	484
		WBT	1.9	20.4			10	129	186	568
		WBR	1.2	12.1			7	102	97	480
	Future Green Spring Road Extension	NBL	0.0	0.0	0.0	0.0	0	0	0	0
		NBT	0.0	0.0			0	0	0	0
		NBR	0.0	0.0			0	0	0	0
	Cook Street	EBL	1.7	6.7	0.5	1.7	5	14	124	175
		EBT	0.0	0.0			1	6	88	139
		EBR	0.0	0.0			1	6	88	139
	Green Spring Road	SBL	3.2	14.1	1.0	6.3	1	2	79	85
		SBT	0.0	0.0			1	2	82	87
		SBR	0.8	5.9			1	1	60	65
	Intersection				1.0	9.2	-			
Access Management Concept #2 (2054)	Cook Street	WBL	0.0	0.0	0.1	7.8	0	46	73	652
		WBT	0.1	8.0			2	42	157	634
		WBR	0.0	5.6			0	42	53	634
	Green Spring Road Extension	NBL	11.5	351.7	11.5	351.7	8	382	83	470
		NBT	0.0	0.0			11	396	97	484
		NBR	0.0	0.0			16	416	117	504
	Cook Street	EBL	2.0	5.2	0.6	1.3	7	10	132	169
		EBT	0.0	0.0			2	3	96	127
		EBR	0.0	0.0			2	3	96	127
	Green Spring Road	SBL	3.3	7.8	0.6	21.6	1	13	73	133
		SBT	0.0	0.0			0	11	75	118
		SBR	0.3	22.4			0	22	53	145
	Intersection				1.1	25.3	-			

Exit 17 Ramp Improvements at ALT US 58 (Cummings Street) and I-81 Southbound Ramps Intersection

There were two ramp improvement concepts analyzed, and the following sections summarize the VISSIM analysis results for both concepts at the ALT US 58 (Cummings Street) and I-81 Southbound Ramps intersection. The first concept evaluated the ramp with a channelized right-turn lane, and the second

concept modifies the westbound approach to accommodate a dedicated right turn lane and a shared left and right turn lane. Both concepts aim to decrease the queue lengths at the westbound approach.

Exit 17 Ramp Improvements Concept #1 – Channelized Right

With the addition of the channelized right turn lane and optimized signal phasing, the ALT US 58 (Cummings Street) and I-81 Southbound Ramps intersection is expected to have an overall delay of 22.1 and 13.0 seconds in the AM and PM peak hour, respectively. The delay for the southbound off-ramp approach decreases significantly with the channelized right turn lane in both the AM and PM peak hours. The westbound right turn movement is free flow resulting in no queue and very little delay. The queue at the westbound approach decreases significantly compared to the queue in the No-Build conditions. The reallocation of signal time significantly decreases delay and queue lengths on northbound and southbound Cummings Street. The analysis results for this alternative can be seen comparing No-Build and Build conditions in **Table 22**.

Table 22: ALT US 58 (Cummings Street) and I-81 Southbound Ramps Intersection VISSIM Results – Ramp Improvement Concept #1 – Channelized Right

Scenario	Approach	Lane Group	Movement Delay (sec)		Approach Delay (sec)		Average Queue (ft)		Maximum Queue (ft)	
			AM	PM	AM	PM	AM	PM	AM	PM
No Build (2054)	I-81 SB Off-Ramp	WBL	120.3	137.5	118.3	141.3	965	1,164	2,996	2,413
		WBR	118.0	142.2			965	1,163	2,996	2,413
	Cummings Street	NBL	21.7	21.8	29.0	20.4	258	136	2,584	1,074
		NBT	29.9	20.2			258	136	2,584	1,074
	Cummings Street	SBT	54.5	133.7	41.2	119.5	232	819	776	1,134
		SBR	17.2	87.5			232	817	776	1,132
	Intersection					56.5	94.3	-		
Ramp Improvement Concept #1 (2054)	I-81 SB Off-Ramp	WBL	23.0	28.5	2.3	5.2	9	24	106	203
		WBR	0.1	0.0			0	0	0	0
	Cummings Street	NBL	20.3	21.8	26.0	12.1	239	78	1,650	734
		NBT	26.7	10.8			239	78	1,650	734
	Cummings Street	SBT	47.6	22.5	34.4	17.2	177	266	735	945
		SBR	10.5	5.2			177	264	735	945
	Intersection					22.1	13.0	-		

Exit 17 Ramp Improvements Concept #2 – Ramp Restriping

With the ramp lane configuration change and optimized signal phasing, the ALT US 58 (Cummings Street) and I-81 Southbound Ramps intersection is expected to have an overall delay of 31.5 and 35.8 seconds in the AM and PM peak hour, respectively. The delay for the westbound approach decreases significantly as vehicles can make the westbound right turn movement from two lanes in both the AM and PM peak hours. The queue at the westbound approach decreases significantly compared to the queue in the No-Build conditions. The analysis results for this alternative can be seen comparing No-Build and Build conditions in **Table 23**.

Table 23: ALT US 58 (Cummings Street) and I-81 Southbound Ramps Intersection VISSIM Results – Ramp Improvement Concept #2 – Ramp Restriping

Scenario	Approach	Lane Group	Movement Delay (sec)		Approach Delay (sec)		Average Queue (ft)		Maximum Queue (ft)	
			AM	PM	AM	PM	AM	PM	AM	PM
No Build (2054)	I-81 SB Off-Ramp	WBL	120.3	137.5	118.3	141.3	965	1,164	2,996	2,413
		WBR	118.0	142.2			965	1,163	2,996	2,413
	Cummings Street	NBL	21.7	21.8	29.0	20.4	258	136	2,584	1,074
		NBT	29.9	20.2			258	136	2,584	1,074
	Cummings Street	SBT	54.5	133.7	41.2	119.5	232	819	776	1,134
		SBR	17.2	87.5			232	817	776	1,132
	Intersection				56.5	94.3	-			
Ramp Improvement Concept #2 (2054)	I-81 SB Off-Ramp	WBL	24.3	29.1	17.7	21.0	75	94	770	711
		WBR	17.0	19.2			76	94	772	712
	Cummings Street	NBL	22.5	24.2	29.7	16.8	261	110	1,650	927
		NBT	30.6	15.8			261	110	1,650	927
	Cummings Street	SBT	59.8	62.6	45.1	53.7	242	575	792	1,787
		SBR	18.5	33.6			242	573	792	1,787
	Intersection				31.5	35.8	-			

Compared to Concept #1 – Ramp Channelization, Concept #2 – Ramp Restriping does not alleviate the I-81 southbound off-ramp delay and queue as significantly, nor does it alleviate Cummings Street delay and queue as significantly. While both concepts significantly reduce the off-ramp queue spillback onto I-81 southbound as shown in **Figure 47**, the ramp restriping concept is not as resilient under 2054 design year traffic demand as the ramp channelization concept.



Figure 47: No Build 2054 and Build 2054 Concepts 1 and 2 Conditions Maximum Queue Lengths

Anticipated Crash Reduction for Alternatives

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 7. For CMFs that could not be located within the SMART SCALE Planning Level CMF List from Round 7, appropriate CMFs from the FHWA CMF Clearinghouse were selected.

Table 24 shows the CMFs and annual crash reductions for the alternatives that provide a safety benefit.

Table 24: CMF and Crash Reduction Summary

Alternative	CMF	Crash Type	Crash Severity	Annual Crash Reduction (F+I)	Location
Protected-Only Left Turn Phasing	0	Angle	All	1.00	ALT US 58 (Cummings Street) and Cook Street
Replace TWLTL with Raised Median	0.65	Angle	All	2.45	On ALT US 58 (Cummings Street) between Cook Street and I-81 Southbound Ramps

Some of the evaluated alternatives considered do not have a match with an existing CMF but do have notable safety benefits:

- The addition of a southbound right turn lane at ALT US 58 (Cummings Street) and Cook Street will reduce rear end crash risk and improve sight distance to the signal head displays by pushing back the roadside hillside
- Eliminating the queue spillback onto the I-81 mainline from the southbound off-ramp will provide a significant safety benefit on I-81

The study team utilized the “Interchange Safety Analysis Tool Enhanced” (ISATe) to project the future safety performance of the two Build 2054 Options relative to the No Build 2054 conditions. ISATe helps to understand the relationship between the proposed geometric design features and safety on the roadway. The tool uses research that has quantified the correlation between design elements and components such as lane widths or dedicated turn lanes and the expected crash frequency.

Table 25 shows the results of the safety predictions for the two Build alternatives under Build 2054 conditions. The study team used ISATe to predict the crashes per year in existing conditions and the crashes per year under both Build concepts. Under Concept 1, the predicted KABC crashes decrease; however, the predicted PDO and total crashes increase. This is due to increased low severity lane-change crashes on northbound Cummings Street. Under Concept 2, all the predicted crashes decrease. The overall safety performance comparison between the two Build options indicates slight preference to Build Option 2; however, this predictive analysis does not account for the safety implications (e.g., elevated rear end crash risk) associated with longer vehicle queues on the off-ramp in Build Option 2 as compared to Build Option 1. ISATe output summaries for Build Options 1 and 2 are included in **Appendix H**.

It is important to note these are predicted crashes and there were a relatively low number of crashes within the study period. This highlights the importance of using this tool for relative crash comparison between alternatives rather than absolute crash total predictions.

Table 25: Interstate Ramp CMF and Crash Reduction Summary

Crash Severity	Existing Crashes Per Year (Predicted) ¹	Concept 1 ISATe CMFs ²	Concept 2 ISATe CMFs ²	Concept 1 2054 Crashes Per Year ³	Concept 2 2054 Crashes Per Year ³
KA	0.07	0.70	0.00	0.05	0.00
KABC	1.85	0.89	0.70	1.65	1.30
PDO	3.20	1.14	0.84	3.65	2.7
All	5.06	1.05	0.79	5.30	4.0

1 Based on ISATe

2 Crash Modification Factors. CMF = 1.0 represents equivalent crash performance. CMF < 1.0 represents crash reduction.

3 Computed as Existing Crashes Per Year (Actual) x ISATe CMF

2.4 Phase 2 Public Involvement

The Phase 2 PublicInput survey was held from February 13th to February 27th, 2026, to collect feedback on the potential improvements within the study corridor. The PublicInput survey provided the study team with an understanding of how the public viewed each alternative before selecting the preferred alternative. 138 respondents participated in the survey and submitted 152 written comments.

The SWG held an in-person public information meeting on Tuesday, February 17th, 2026, from 4:00–6:00 PM at the EO Regional Workforce and Child Development Hub, to collect additional feedback and input on the potential improvements. 23 community members attended the public information meeting, including 10 government staff/officials. Feedback gathered during the in-person meeting was consistent with the feedback received from the PublicInput survey.

Survey Results by Alternative

Survey respondents were asked to rate the alternatives from strongly opposed to strongly support. **Figure 48** summarizes the average ranking of the alternatives presented in the survey for each intersection. An average score of five corresponds with strong support while an average score of one corresponds with strong opposition. Most alternatives had an average ranking close to three, showing a range of moderate opposition to moderate support across alternatives. **Table 26** presents public involvement feedback themes associated with the proposed alternatives and **Table 27** presents the survey feedback for each intersection concept. Detailed survey results are shown in **Appendix I**.

Pedestrian Safety Alternatives

Survey respondents ranked the pedestrian bridge at the ALT US 58 (Cummings Street) and Cook Street intersection and the pedestrian refuge island at Bradley Street alternatives above three showing support for the pedestrian-focused alternatives. The pedestrian bridge was the highest ranked alternative with an average rank of 3.46. 56% of respondents (47 respondents) supported the pedestrian bridge, and 45% of respondents (56 respondents) supported the pedestrian refuge island. Public involvement respondents raised concerns over the level of pedestrian activity and questioned whether there was enough pedestrian

activity to justify the crossings. The SWG had already established that there is a need for pedestrian infrastructure from the VDOT Pedestrian Bicycle Safety Action Plan v.4 (PBSAP) and STRAVA data as documented in **Chapter 1.5.2**.

Access Management Concepts for ALT US 58 (Cummings Street) between Bradley Street and Cook Street

Survey respondents ranked the four access management concepts between ALT US 58 (Cummings Street) between Bradley Street and Cook Street similarly with scores between two and three. Concept #4 had the highest support with 37% of respondents supporting the concept (29 respondents). Public involvement respondents shared concerns about making the left turn movement into the shopping center after removing the two-left turn lane. Additionally, participants requested a traffic light for this section of ALT US 58 (Cummings Street).

Intersection Geometry Modification at ALT US 58 (Cummings Street) and Cook Street Intersection

Survey respondents were in favor of the intersection geometry modifications at ALT US 58 (Cummings Street) and Cook Street with an average ranking of 3.14. 44% of respondents (35 respondents) supported the alternative. There was general support for the southbound right turn lane, but public involvement participants questioned whether the northbound left turn lanes are needed. Respondents had concerns about other movements like the westbound left turn and the eastbound right turn not being addressed for congestion issues.

Access Management Concepts for ALT US 58 (Cummings Street) between Cook Street and I-81 Southbound Ramps

Survey respondents preferred the first access management concept for ALT US 58 (Cummings Street) between Cook Street and the I-81 Southbound Ramps over the second concept. 52% of respondents (34 respondents) supported Concept #1 while only 25% of respondents (16 respondents) supported Concept #2. There was general support among respondents for the Green Spring Road extension, however many responses opposed a raised median.

Exit 17 Ramp Improvements at ALT US 58 (Cummings Street) and I-81 Southbound Ramps Intersection

Survey respondents favored Concept #1 for the Exit 17 ramp improvement concept over Concept #2. Concept #1 received an average ranking of 3.41, which is the second most supported alternative across the corridor. 57% of respondents (33 respondents) supported Concept 1, while only 33% of respondents (19 respondents) supported Concept #2. Respondents shared concerns about the shared left/right turn option making the left turn more difficult.

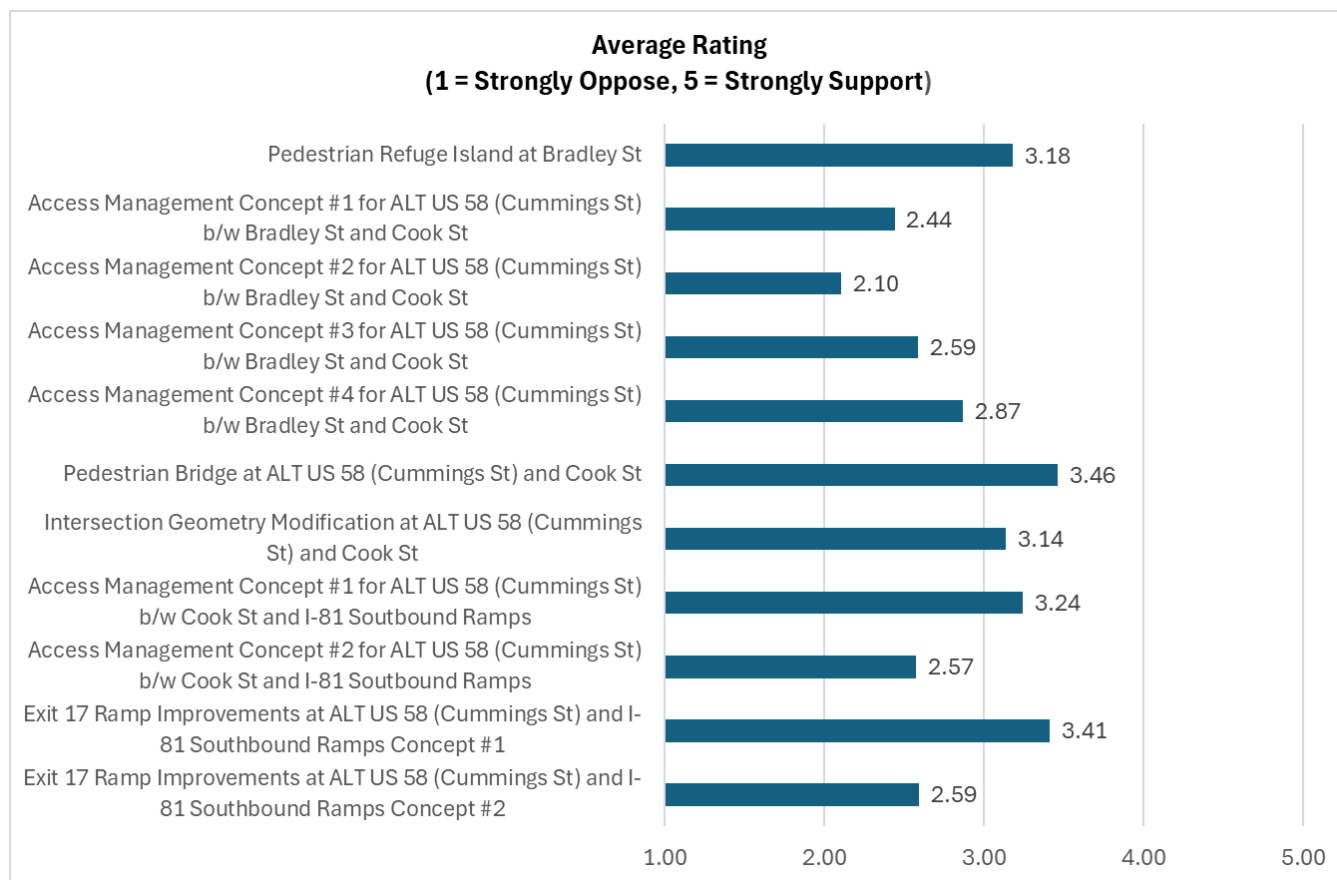


Figure 48: Public Engagement—Average Rating of Alternatives

Table 26: Public Involvement Feedback Themes for Proposed Alternatives

Alternative	Public Involvement Feedback Themes
Pedestrian Refuge Island at Bradley St	General support for improvements that would make this crossing safer. There were some concerns about pedestrian safety due to visibility of the crosswalk to drivers, and some concerns about whether there is enough pedestrian activity to justify the crossing.
Access Management Concepts for ALT US 58 (Cummings St) b/w Bradley St and Cook St	Concerns about making the left turn into the shopping center harder after removing the two-left turn lane. Multiple comments about a traffic light desired for this section of ALT US 58 (Cummings Street) and allowing lefts at the light.
Pedestrian Bridge at ALT US 58 (Cummings St) and Cook St	Concerns about whether there is enough pedestrian activity to justify the construction of a pedestrian bridge. Multiple comments about the steep grade of the ramps to/from the pedestrian bridge. Additionally, concerns about the limited access points to the bridge and being accessible to current pedestrian travel patterns.
Intersection Geometry Modification at ALT US 58 (Cummings St) and Cook St	General support for the southbound right turn lane, but not sure if the northbound left turn lanes are needed. Concerns about other movements like the westbound left turn and the eastbound right turn not being addressed for congestion issues.
Access Management Concepts for ALT US 58 (Cummings St) b/w Cook St and I-81 Southbound Ramps	General support for the Green Spring Road extension, however many responses opposed a raised median.
Exit 17 Ramp Improvements at ALT US 58 (Cummings St) and I-81 Southbound Ramps	General support for the channelized right concept, and concerns about the shared left/right turn option making the left turn more difficult.

Table 27: Intersection Survey Responses

Alternative	Public Involvement Feedback Themes																														
Pedestrian Refuge Island at Bradley St	<table><tr><th>Response</th><th>Percentage</th></tr><tr><td>Strongly Oppose</td><td>24%</td></tr><tr><td>Somewhat Oppose</td><td>6%</td></tr><tr><td>Neutral</td><td>25%</td></tr><tr><td>Somewhat Support</td><td>17%</td></tr><tr><td>Strongly Support</td><td>28%</td></tr></table>	Response	Percentage	Strongly Oppose	24%	Somewhat Oppose	6%	Neutral	25%	Somewhat Support	17%	Strongly Support	28%																		
Response	Percentage																														
Strongly Oppose	24%																														
Somewhat Oppose	6%																														
Neutral	25%																														
Somewhat Support	17%																														
Strongly Support	28%																														
Access Management Concepts for ALT US 58 (Cummings St) b/w Bradley St and Cook St	<table><tr><th>Response</th><th>Access Management Concept #1 for ALT US 58 (Cummings St) b/w Bradley St and Cook St</th><th>Access Management Concept #2 for ALT US 58 (Cummings St) b/w Bradley St and Cook St</th><th>Access Management Concept #3 for ALT US 58 (Cummings St) b/w Bradley St and Cook St</th><th>Access Management Concept #4 for ALT US 58 (Cummings St) b/w Bradley St and Cook St</th></tr><tr><td>Strongly Oppose</td><td>35%</td><td>44%</td><td>41%</td><td>35%</td></tr><tr><td>Somewhat Oppose</td><td>17%</td><td>21%</td><td>5%</td><td>8%</td></tr><tr><td>Neutral</td><td>27%</td><td>21%</td><td>20%</td><td>19%</td></tr><tr><td>Somewhat Support</td><td>10%</td><td>9%</td><td>20%</td><td>13%</td></tr><tr><td>Strongly Support</td><td>11%</td><td>5%</td><td>13%</td><td>25%</td></tr></table>	Response	Access Management Concept #1 for ALT US 58 (Cummings St) b/w Bradley St and Cook St	Access Management Concept #2 for ALT US 58 (Cummings St) b/w Bradley St and Cook St	Access Management Concept #3 for ALT US 58 (Cummings St) b/w Bradley St and Cook St	Access Management Concept #4 for ALT US 58 (Cummings St) b/w Bradley St and Cook St	Strongly Oppose	35%	44%	41%	35%	Somewhat Oppose	17%	21%	5%	8%	Neutral	27%	21%	20%	19%	Somewhat Support	10%	9%	20%	13%	Strongly Support	11%	5%	13%	25%
Response	Access Management Concept #1 for ALT US 58 (Cummings St) b/w Bradley St and Cook St	Access Management Concept #2 for ALT US 58 (Cummings St) b/w Bradley St and Cook St	Access Management Concept #3 for ALT US 58 (Cummings St) b/w Bradley St and Cook St	Access Management Concept #4 for ALT US 58 (Cummings St) b/w Bradley St and Cook St																											
Strongly Oppose	35%	44%	41%	35%																											
Somewhat Oppose	17%	21%	5%	8%																											
Neutral	27%	21%	20%	19%																											
Somewhat Support	10%	9%	20%	13%																											
Strongly Support	11%	5%	13%	25%																											
Pedestrian Bridge at ALT US 58 (Cummings St) and Cook St	<table><tr><th>Response</th><th>Percentage</th></tr><tr><td>Strongly Oppose</td><td>21%</td></tr><tr><td>Somewhat Oppose</td><td>5%</td></tr><tr><td>Neutral</td><td>18%</td></tr><tr><td>Somewhat Support</td><td>18%</td></tr><tr><td>Strongly Support</td><td>38%</td></tr></table>	Response	Percentage	Strongly Oppose	21%	Somewhat Oppose	5%	Neutral	18%	Somewhat Support	18%	Strongly Support	38%																		
Response	Percentage																														
Strongly Oppose	21%																														
Somewhat Oppose	5%																														
Neutral	18%																														
Somewhat Support	18%																														
Strongly Support	38%																														

Table 27: Intersection Survey Responses

Alternative	Public Involvement Feedback Themes																		
Intersection Geometry Modification at ALT US 58 (Cummings St) and Cook St	<table><tr><th>Response</th><th>Percentage</th></tr><tr><td>Strongly Oppose</td><td>19%</td></tr><tr><td>Somewhat Oppose</td><td>13%</td></tr><tr><td>Neutral</td><td>24%</td></tr><tr><td>Somewhat Support</td><td>24%</td></tr><tr><td>Strongly Support</td><td>20%</td></tr></table>	Response	Percentage	Strongly Oppose	19%	Somewhat Oppose	13%	Neutral	24%	Somewhat Support	24%	Strongly Support	20%						
Response	Percentage																		
Strongly Oppose	19%																		
Somewhat Oppose	13%																		
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Access Management Concepts for ALT US 58 (Cummings St) b/w Cook St and I-81 Southbound Ramps	<table><tr><th>Response</th><th>Access Management Concept #1 for ALT US 58 (Cummings St) b/w Cook St and I-81 Southbound Ramps</th><th>Access Management Concept #2 for ALT US 58 (Cummings St) b/w Cook St and I-81 Southbound Ramps</th></tr><tr><td>Strongly Oppose</td><td>26%</td><td>30%</td></tr><tr><td>Somewhat Oppose</td><td>8%</td><td>16%</td></tr><tr><td>Neutral</td><td>15%</td><td>29%</td></tr><tr><td>Somewhat Support</td><td>20%</td><td>17%</td></tr><tr><td>Strongly Support</td><td>32%</td><td>8%</td></tr></table> ■ Access Management Concept #1 for ALT US 58 (Cummings St) b/w Cook St and I-81 Southbound Ramps ■ Access Management Concept #2 for ALT US 58 (Cummings St) b/w Cook St and I-81 Southbound Ramps	Response	Access Management Concept #1 for ALT US 58 (Cummings St) b/w Cook St and I-81 Southbound Ramps	Access Management Concept #2 for ALT US 58 (Cummings St) b/w Cook St and I-81 Southbound Ramps	Strongly Oppose	26%	30%	Somewhat Oppose	8%	16%	Neutral	15%	29%	Somewhat Support	20%	17%	Strongly Support	32%	8%
Response	Access Management Concept #1 for ALT US 58 (Cummings St) b/w Cook St and I-81 Southbound Ramps	Access Management Concept #2 for ALT US 58 (Cummings St) b/w Cook St and I-81 Southbound Ramps																	
Strongly Oppose	26%	30%																	
Somewhat Oppose	8%	16%																	
Neutral	15%	29%																	
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Strongly Support	32%	8%																	
Exit 17 Ramp Improvements at ALT US 58 (Cummings St) and I-81 Southbound Ramps Concepts	<table><tr><th>Response</th><th>Exit 17 Ramp Improvements at ALT US 58 (Cummings St) and I-81 Southbound Ramps Concept #1</th><th>Exit 17 Ramp Improvements at ALT US 58 (Cummings St) and I-81 Southbound Ramps Concept #2</th></tr><tr><td>Strongly Oppose</td><td>21%</td><td>36%</td></tr><tr><td>Somewhat Oppose</td><td>5%</td><td>15%</td></tr><tr><td>Neutral</td><td>17%</td><td>17%</td></tr><tr><td>Somewhat Support</td><td>26%</td><td>19%</td></tr><tr><td>Strongly Support</td><td>31%</td><td>14%</td></tr></table> ■ Exit 17 Ramp Improvements at ALT US 58 (Cummings St) and I-81 Southbound Ramps Concept #1 ■ Exit 17 Ramp Improvements at ALT US 58 (Cummings St) and I-81 Southbound Ramps Concept #2	Response	Exit 17 Ramp Improvements at ALT US 58 (Cummings St) and I-81 Southbound Ramps Concept #1	Exit 17 Ramp Improvements at ALT US 58 (Cummings St) and I-81 Southbound Ramps Concept #2	Strongly Oppose	21%	36%	Somewhat Oppose	5%	15%	Neutral	17%	17%	Somewhat Support	26%	19%	Strongly Support	31%	14%
Response	Exit 17 Ramp Improvements at ALT US 58 (Cummings St) and I-81 Southbound Ramps Concept #1	Exit 17 Ramp Improvements at ALT US 58 (Cummings St) and I-81 Southbound Ramps Concept #2																	
Strongly Oppose	21%	36%																	
Somewhat Oppose	5%	15%																	
Neutral	17%	17%																	
Somewhat Support	26%	19%																	
Strongly Support	31%	14%																	

2.5 Preferred Alternative Selection

VHB presented the PublicInput survey results at SWG Meeting #6, held on March 10th, 2026.⁴ During this meeting, VHB suggested a set of alternatives to advance towards the development of a preferred alternative as outlined in **Chapter 1: Needs Evaluation and Diagnosis**. The improvements were also categorized into three different categories as follows:

- **Short-Term Recommendations:** This category consists of recommended maintenance and operational improvements that can be implemented immediately by state/local forces. Examples of short-term recommendations include vegetation management, HSIP systemic-level safety improvements, and signal timings adjustments. Some of the short-term recommendations from this category can be included in the final mid-term investment strategy.
- **Mid-Term Investment Strategy:** This category consists of the preferred alternatives for which funding will be requested within the next year. The recommendations from this category advance to Phase 3 of the Project Pipeline study for further refinement and cost analysis.
- **Long-Term Investment Vision:** This category includes recommendations that represent a long-term investment vision (beyond 20 years) intended to guide the locality in their comprehensive planning. These improvements will not be considered for SMART SCALE funding and will not advance to Phase 3 of Project Pipeline.

Table 28 shows the Phase 2 alternatives sorted into the three categories. Based on preliminary VISSIM results, public survey responses, and discussions with the SWG, the preferred alternatives were selected, further developed in Phase 3, and subsequently presented at SWG Meeting #8 on May 21st, 2026. The following alternatives were selected as the final preferred alternatives:

- Pedestrian refuge island at the ALT US 58 (Cummings Street) and the Bradley Street intersection
- Intersection geometry modifications at ALT US 58 (Cummings Street) and Cook Street intersection
- Access management concept #1 for ALT US 58 (Cummings Street) between Cook Street and I-81 Southbound Ramps intersection, along with the Green Spring Road connection
- Intersection geometry changes at the I-81 Southbound off-ramp (the westbound right turn channelization concept)

Presentation materials are provided for reference below from the finalized Preferred Alternatives meeting and the Phase 2 Preferred Alternative Summary.⁵ The decision to long-term plan for the pedestrian bridge was based on cost and funding viability. The decision to long-term plan for access management improvements on the northern end of the study corridor was based on a variety of factors, including current vacancy of former Kroger parcel, lack of clear consensus on the best alternative, and design challenges that surfaced during an April 2026 field meeting, including sight distance at the Abingdon Olive Oil Company and issues along Mont Calm (right of way status, parking lot retaining structure).

Figure 49 shows the final selected alternatives combined within the study area.

⁴ [PublicInput Results Study Work Group Presentation:](https://app.mural.co/t/vhbipd8103/m/vhbipd8103/1771276753382/66ef8e267b7d2429b378b8123d6199df52a8150a)
<https://app.mural.co/t/vhbipd8103/m/vhbipd8103/1771276753382/66ef8e267b7d2429b378b8123d6199df52a8150a>

⁵ [Preferred Alternatives Study Work Group Presentation:](https://app.mural.co/t/vhbipd8103/m/vhbipd8103/1778010336732/a5d9055de6e37683f5296f087e38264f0bd27be4)
<https://app.mural.co/t/vhbipd8103/m/vhbipd8103/1778010336732/a5d9055de6e37683f5296f087e38264f0bd27be4>

Table 28: Preferred Alternative Selection

Section/Intersection	Short-Term	Preferred Alternative	Long-Term	Not Recommended
ALT US 58 (Cummings Street) at Bradley Street		Crosswalk improvements – pedestrian refuge island, southbound road diet		
ALT US 58 (Cummings Street) between Bradley Street and Cook Street			Access Management Improvements to consolidate left turn movements	
ALT US 58 (Cummings Street) and Cook Street	Change left turn signal phasing to protected only and install supplemental signal head for southbound Cummings Street	Construct second northbound left-turn lane and construct southbound right turn lane. Reconfigure lanes on westbound Cook Street	Pedestrian bridge recommended for long term Town of Abingdon planning	
ALT US 58 (Cummings Street) between Cook Street and I-81 Southbound Ramps		Construct access management option with left turn into Towne Center and Green Spring Road extension		
ALT US 58 (Cummings Street) and I-81 Southbound Ramps		Construct channelized off-ramp right turn lane		Ramp restriping/widening

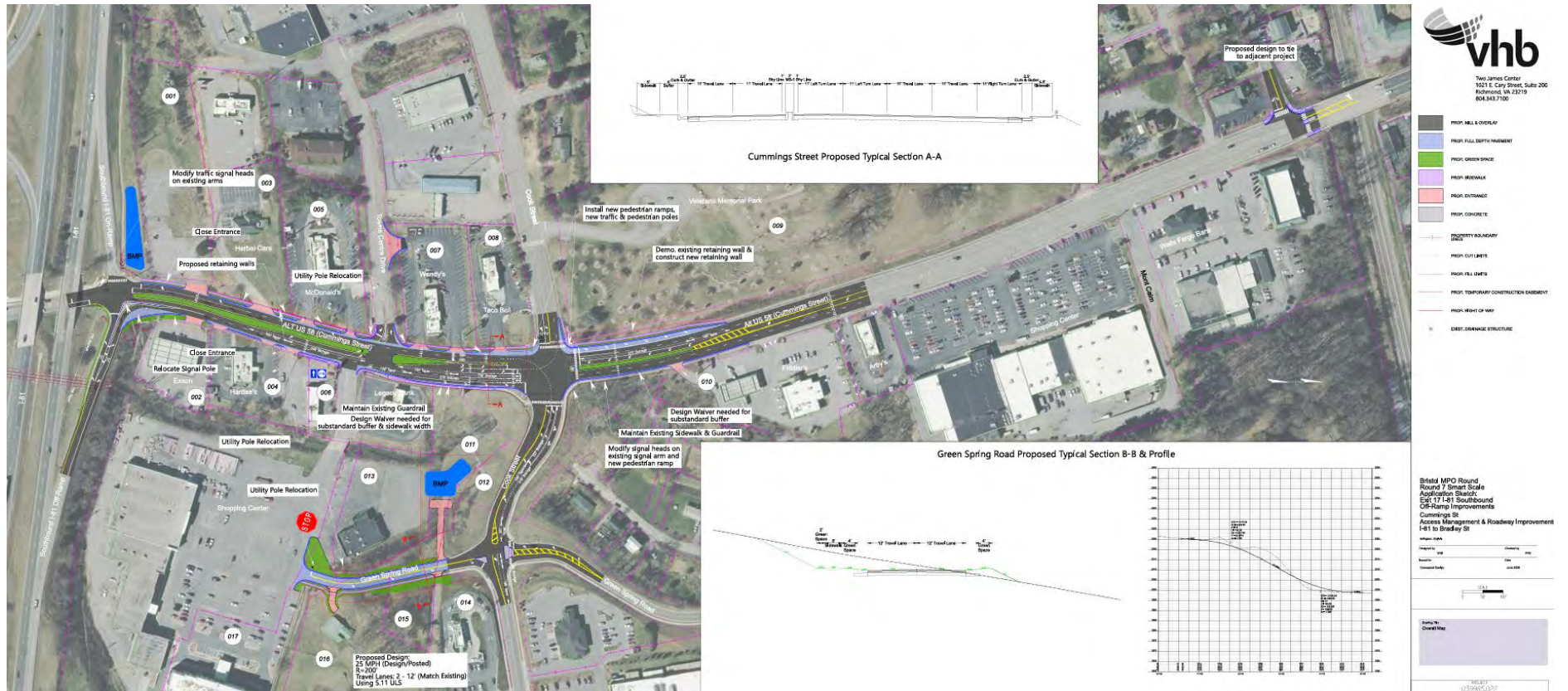


Figure 49: Preferred Alternative Sketch

With the addition of the two dedicated right-turn lanes and optimized signal phasing, the ALT US 58 (Cummings Street) and I-81 Southbound Ramps intersection is expected to have an overall delay of 15.9 and 20.5 seconds in the AM and PM peak hour, respectively. The delay for the westbound approach decreases significantly as vehicles can make the westbound right turn movement from two lanes in both the AM and PM peak hours. The queue at the westbound approach decreases significantly compared to the queue in the No-Build conditions. The analysis results for this alternative can be seen comparing No-Build and Build conditions in **Table 29**. Operationally, this ramp widening concept performs better than the ramp restriping concept but not as well as the ramp channelization concept.

Table 29: ALT US 58 (Cummings Street) and I-81 Southbound Ramps Intersection VISSIM Results – New Ramp Widening Concept

Scenario	Approach	Lane Group	Movement Delay (sec)		Approach Delay (sec)		Average Queue (ft)		Maximum Queue (ft)	
			AM	PM	AM	PM	AM	PM	AM	PM
No Build (2054)	I-81 SB Off-Ramp	WBL	120.3	137.5	118.3	141.3	965	1,164	2,996	2,413
		WBR	118.0	142.2			965	1,163	2,996	2,413
	Cummings Street	NBL	21.7	21.8	29.0	20.4	258	136	2,584	1,074
		NBT	29.9	20.2			258	136	2,584	1,074
	Cummings Street	SBT	54.5	133.7	41.2	119.5	232	819	776	1,134
		SBR	17.2	87.5			232	817	776	1,132
	Intersection				56.5	94.3	-			
Phase 3 New Ramp Widening Concept (2054)	I-81 SB Off-Ramp	WBL	20.6	19.9	24.9	20.2	70	53	432	281
		WBR	25.3	20.2			71	52	432	281
	Cummings Street	NBL	16.6	21.1	12.1	10.8	92	60	2,052	610
		NBT	11.5	9.5			92	60	2,052	610
	Cummings Street	SBT	20.2	31.7	13.4	26.1	74	348	457	1,236
		SBR	1.2	13.4			72	345	453	1,236
	Intersection				15.9	20.5	-			

This alternative was ultimately not selected as the preferred alternative due to the negative impacts to the northbound approach from pushing the stop bars back. There is a significant queue on the northbound approach, especially in the AM peak hour, and pushing the stop bars back decreased the distance between this intersection and the southern northbound ramps intersection. Instead, a revised ramp channelization concept was developed, as documented in **Chapter 3: Preferred Alternative Analysis and Investment Strategy**.

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. As discussed in **Section 2.5 Preferred Alternative Selection**, the SWG chose the access management concept with the northbound left turn into Towne Centre Drive, the Green Spring Road extension, the geometry modifications at the ALT US 58 (Cummings St) and Cook Street intersection, and the ALT US 58 (Cummings St) and I-81 Southbound ramp channelization. The preferred alternative concept has the following components:

- Pedestrian refuge island at the ALT US 58 (Cummings St) and Bradley Street intersection
- ALT US 58 (Cummings St) and Cook Street intersection geometry modifications
 - Construct southbound right turn lane
 - Construct second northbound left turn lane
 - Restripe westbound Cook St approach to dual left turn lanes with one shared through/right turn lane
 - Widen receiving lanes on southbound Cummings Street to provide more width for dual left
- Install median along ALT US 58 (Cummings St) to manage access between Cook Street and I-81
 - Allow northbound left turns at Towne Centre Drive
 - Extend Green Spring Road from Cook Street
- Cook Street and Green Spring Road intersection modifications
 - Convert existing southbound approach to right-in/right-out only
 - New northbound approach will be right-in/left-in/right out
- Construct channelized right turn lane on I-81 Southbound off-ramp

3.1 Preferred Alternative Safety and Operational Analysis

Once the preferred alternative was selected, the study team conducted VISSIM analysis to reflect the refined geometry of the preferred alternative and quantify the anticipated future traffic operations. The Build VISSIM models include the geometry modifications at the ALT US 58 (Cummings St) and Cook St intersection, the addition of a channelized westbound right turn lane at the ALT US 58 (Cummings St) and the I-81 Southbound off-ramp intersection, and the addition of the Green Spring Road extension. Traffic signal cycle lengths were assumed to be consistent with No-Build conditions, while splits and offsets were optimized.

Anticipated Traffic Operations Results for Preferred Alternative

Build conditions analyses were conducted for the AM and PM peak periods. **Table 30** through **Table 32** summarize the VISSIM control delay, as well as average, and maximum queue lengths measures of effectiveness and compare the Build conditions results against the No-Build conditions results.

Intersection Geometry Modification at ALT US 58 (Cummings Street) and Cook Street

At this intersection an additional modification was proposed during Phase 3. The westbound approach at Cook Street is recommended to be re-stripped to include dual left-turn lanes and a shared through and right turn lane. With this modification along with the addition of the second northbound left turn lane and the southbound right turn lane, the ALT US 58 (Cummings Street) and Cook Street intersection is expected to have an overall delay of 19.5 and 31.7 seconds in the AM and PM peak hour, respectively. The northbound approach delay and queue lengths are expected to increase with the second left turn lane due to the signal phasing change from protected-permissive to protected only. The analysis results for this alternative can be seen comparing No-Build and Build conditions in **Table 30**.

Table 30: ALT US 58 (Cummings Street) and Cook Street Intersection VISSIM Results – Preferred Alternative

Scenario	Approach	Lane Group	Movement Delay (sec)		Approach Delay (sec)		Average Queue (ft)		Maximum Queue (ft)	
			AM	PM	AM	PM	AM	PM	AM	PM
No-Build (2054)	Cook Street	WBL	32.6	58.8	32.7	42.3	60	137	316	413
		WBT	36.0	61.3			60	137	316	413
		WBR	30.8	9.3			60	137	316	413
	Cummings Street	NBL	10.6	24.7	9.3	17.6	44	71	231	295
		NBT	14.6	28.5			44	71	231	295
		NBR	0.9	1.6			41	72	244	308
	Cook Street	EBL	35.8	41.1	45.9	58.2	61	81	306	332
		EBT	62.4	82.3			61	81	306	332
		EBR	35.5	54.8			59	80	310	335
	Cummings Street	SBL	9.3	32.2	19.4	42.6	63	254	277	930
		SBT	20.2	46.5			63	254	277	930
		SBR	25.1	40.1			63	258	277	937
	Intersection				18.7	34.6	-			
Preferred Alternative (2054)	Cook Street	WBL	30.6	48.5	31.0	54.0	56	197	254	965
		WBT	30.4	61.4			56	197	254	965
		WBR	32.7	63.3			56	197	254	965
	Cummings Street	NBL	31.6	42.5	13.8	18.7	69	74	337	328
		NBT	15.4	25.1			69	74	337	328
		NBR	0.7	1.0			63	74	353	344
	Cook Street	EBL	34.1	38.7	35.2	42.3	49	115	253	482
		EBT	45.1	52.2			49	115	253	482
		EBR	24.6	37.9			47	116	256	485
	Cummings Street	SBL	10.1	24.1	16.1	25.2	35	104	179	488
		SBT	17.3	25.9			35	104	179	488
		SBR	18.4	23.9			31	100	178	488
	Intersection				19.5	31.7	-			

Access Management Concepts for ALT US 58 (Cummings Street) between Cook Street and I-81 Southbound Ramps

The access management concept with the Green Spring Road extension was selected as the preferred alternative. Based on previous operations analysis and substandard signal spacing, the study team determined that the Green Spring Road connection should be stop controlled with a right out only at the Green Spring Road and Cook Street intersection.

The Cook Street and Green Springs Road intersection is expected to have an overall delay of 0.2 and 7.4 seconds in the AM and PM peak hour respectively. In this alternative this intersection is stop-controlled with a right out only, and there are no significant projected operational issues. The analysis results for this alternative can be seen comparing No-Build and Build conditions in **Table 31**.

Table 31: Cook Street and Green Springs Road Intersection VISSIM Results – Preferred Alternative

Scenario	Approach	Lane Group	Movement Delay (sec)		Approach Delay (sec)		Average Queue (ft)		Maximum Queue (ft)	
			AM	PM	AM	PM	AM	PM	AM	PM
No-Build (2054)	Cook Street	WBL	0.0	0.0	1.8	19.9	7	103	101	484
		WBT	1.9	20.4			10	129	186	568
		WBR	1.2	12.1			7	102	97	480
	Green Spring Road Extension	NBL	0.0	0.0	0.0	0.0	0	0	0	0
		NBT	0.0	0.0			0	0	0	0
		NBR	0.0	0.0			0	0	0	0
	Cook Street	EBL	1.7	6.7	0.5	1.7	5	14	124	175
		EBT	0.0	0.0			1	6	88	139
		EBR	0.0	0.0			1	6	88	139
	Green Spring Road	SBL	3.2	14.1	1.0	6.3	1	2	79	85
		SBT	0.0	0.0			1	2	82	87
		SBR	0.8	5.9			1	1	60	65
	Intersection				1.0	9.2	-			
Preferred Alternative (2054)	Cook Street	WBL	0.0	0.0	0.0	11.6	0	103	5	586
		WBT	0.0	12.3			0	82	0	497
		WBR	0.0	9.8			0	93	0	540
	Green Spring Road Extension	NBR	2.3	6.1	2.3	6.1	5	13	85	129
	Cook Street	EBT	0.0	0.0	0.0	0.0	0	0	0	0
		EBR	0.0	0.0			0	0	0	0
	Green Spring Road	SBR	1.7	35.6	1.7	35.6	5	28	86	176
	Intersection				0.2	7.4	-			

During Phase 3, the SWG discussed potential access improvements to the Taco Bell property but ultimately decided that the new left turn into Towne Centre Drive provided Taco Bell with access from northbound Cummings Street.

Exit 17 Ramp Improvements at ALT US 58 (Cummings Street) and I-81 Southbound Ramps Intersection

The selected preferred alternative at the interchange is the channelized right turn lane. As mentioned previously, the selected preferred alternative was refined in Phase 3 to no longer propose a full property acquisition of the Exxon gas station, as this could result in significant project costs or schedule delays. The alternative was modified to only close the southern Exxon driveway and to introduce a raised median in front of the Exxon to prevent left turn movements. Due to the changes proposed to the I-81 southbound off-ramp, the study team completed an Operational Safety Analysis Report (OSAR) – see **Appendix J**.

With the addition of the channelized right turn lane and optimized signal phasing, the ALT US 58 (Cummings Street) and I-81 Southbound Ramps intersection is expected to have an overall delay of 8.0 and 17.9 seconds in the AM and PM peak hour, respectively. The delay for the westbound approach decreases significantly with the channelized right turn lane in both the AM and PM peak hours. The westbound right turn movement is free flow resulting in no queue and very little delay. The queue at the westbound approach decreases significantly compared to the queue in the No-Build conditions. The analysis results for this alternative can be seen comparing No-Build and Build conditions in **Table 32**.

Table 32: ALT US 58 (Cummings Street) and I-81 Southbound Ramps Intersection VISSIM Results – Ramp Improvement Preferred Alternative

Scenario	Approach	Lane Group	Movement Delay (sec)		Approach Delay (sec)		Average Queue (ft)		Maximum Queue (ft)	
			AM	PM	AM	PM	AM	PM	AM	PM
No Build (2054)	I-81 SB Off-Ramp	WBL	120.3	137.5	118.3	141.3	965	1,164	2,996	2,413
		WBR	118.0	142.2			965	1,163	2,996	2,413
	Cummings Street	NBL	21.7	21.8	29.0	20.4	258	136	2,584	1,074
		NBT	29.9	20.2			258	136	2,584	1,074
	Cummings Street	SBT	54.5	133.7	41.2	119.5	232	819	776	1,134
		SBR	17.2	87.5			232	817	776	1,132
	Intersection					56.5	94.3	-		
Preferred Alternative (2054)	I-81 SB Off-Ramp	WBL	1.7	22.7	0.2	7.6	2	44	78	529
		WBR	0.0	4.2			0	39	14	524
	Cummings Street	NBL	17.2	23.6	10.1	11.5	82	63	1,994	603
		NBT	9.2	10.0			82	63	1,994	603
	Cummings Street	SBT	18.0	31.0	11.7	26.1	65	344	435	1,274
		SBR	0.6	14.8			63	341	432	1,274
	Intersection					8.0	17.9	-		

Figure 51 depicts the maximum queue lengths at the ALT US 58 (Cummings St) and I-81 Southbound off-ramps intersection with the preferred alternative.



Figure 51: Preferred Alternative Maximum Queue Lengths

3.2 Conceptual Sketch and Cost Estimates

The SWG and study team developed two SMART SCALE applications for the Town of Abingdon Project Pipeline study. The first application consists of the entirety of the selected preferred alternative, and the second application consists of only the selected preferred alternative at the ALT US 58 (Cummings Street) and I-81 southbound off-ramp intersection.

3.2.1 Cummings Street Access Management and Turn Lanes

This application consists of the following preferred alternative:

- Pedestrian refuge island at the ALT US 58 (Cummings Street) and the Bradley St intersection
- Intersection geometry modifications at ALT US 58 (Cummings Street) and Cook Street intersection
- Access management concept #1 for ALT US 58 (Cummings Street) between Cook Street and I-81 Southbound Ramps intersection, along with the Green Spring Road connection
- Intersection geometry changes at the I-81 Southbound off-ramp (the westbound right turn channelization concept)

Appendix K 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 52** presents the preferred alternative planning level 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 33**. Detailed cost estimates are included in **Appendix K** as part of the Basis of Design Memos.

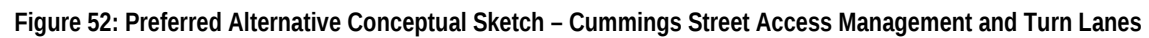


Table 33: BR-25-01 Preferred Alternative Improvements – Cummings Street Access Management and Turn Lanes

Phase Description	Budget (FY 2026)
Preliminary Engineering	\$ 3,649,325
Right of Way and Utility Relocation	\$ 3,136,429
Construction	\$20,528,082
Total Project Budget	\$27,313,837

3.2.2 I-81 Exit 17 Southbound Off-Ramp

This application consists of the following preferred alternatives:

- Intersection geometry changes at the I-81 Southbound off-ramp (the westbound right turn channelization concept)

Appendix L 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 53** presents the preferred alternative planning level 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 34**. Detailed cost estimates are included in **Appendix L** as part of the Basis of Design Memos.

Table 34: BR-25-01 Preferred Alternative Improvements – I-81 Exit 17 Southbound Off-Ramp

Phase Description	Budget (FY 2026)
Preliminary Engineering	\$ 1,683,437
Right of Way and Utility Relocation	\$ 484,748
Construction	\$ 4,748,459
Total Project Budget	\$ 6,916,644

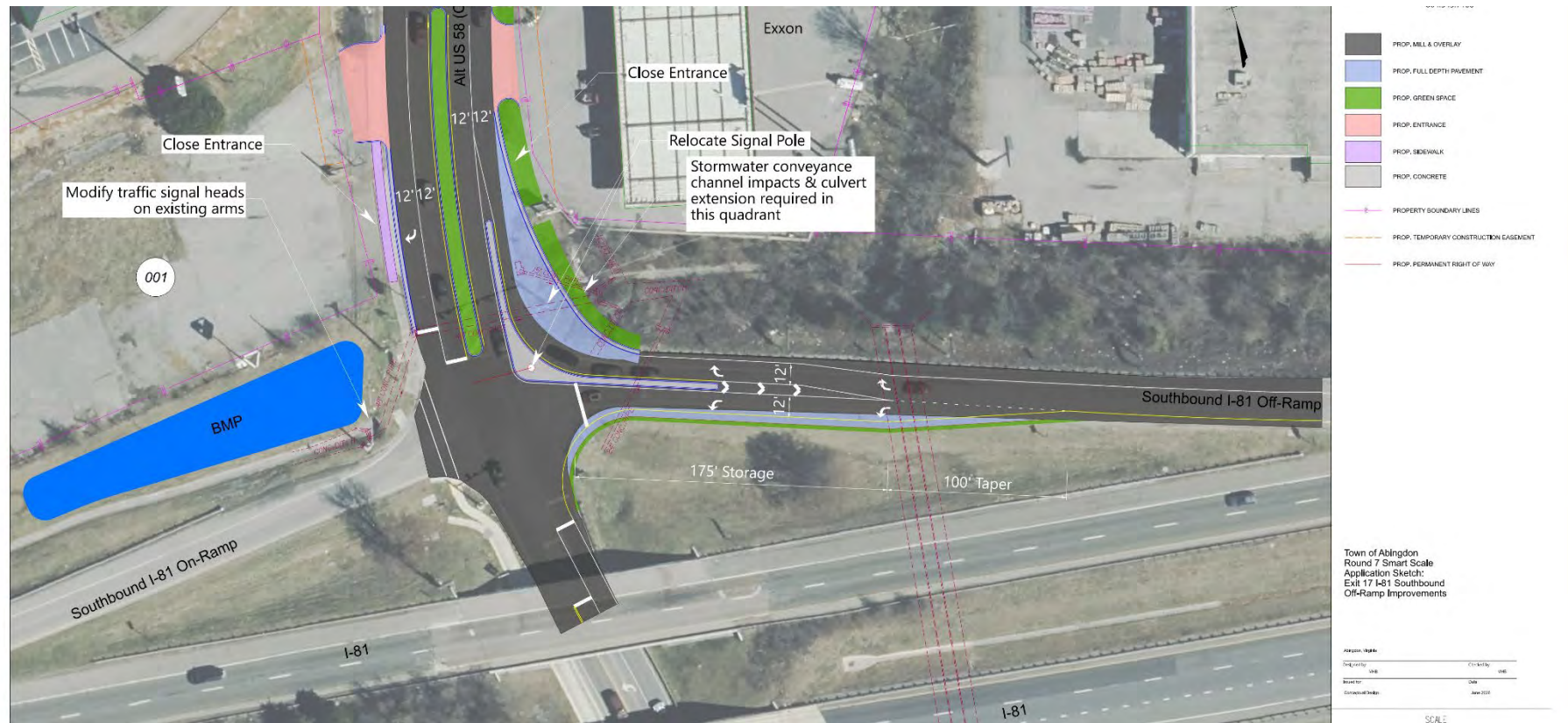


Figure 53: Preferred Alternative Conceptual Sketch – I-81 Exit 17 Southbound Off-Ramp

3.3 Schedule Estimates

VDOT developed schedule estimates for the preferred alternatives. **Table 35** and **Table 36** summarize the projected timeframes for the preliminary engineering (PE), right of way (RW), and construction (CN) phases.

Table 35: Schedule Estimate for Cummings Street Access Management and Turn Lanes

Estimated Schedule by Phase	PE	RW	CN	Total
Preferred Concept (all inclusive, months)	37	15	32	84

Table 36: Schedule Estimate for I-81 Southbound Off-Ramp

Estimated Schedule by Phase	PE	RW	CN	Total
Preferred Concept (all inclusive, months)	22	15	24	61

3.4 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.

Project risk was discussed at the SWG Meeting #7, #8, and #9. The SWG decided not to include a full-take of the Exxon gas station to avoid major risk associated with required maintenance of the retaining wall or environmental remediation. The SWG also limited the I-81 off ramp widening to the south so that the stream is not impacted. A final concept, cost, and risk meeting (SWG Meeting #9) was held on June 17th, 2026, to review the final preferred alternative. Presentation materials are provided for reference below from the finalized Final Concept, Cost, and Risk Meeting.⁶

The following is a list of 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 K** and **Appendix L** include the materials from both meetings as a part of the risk register section of each Basis of Design memorandum. The Basis of Design memorandums include risk analysis matrices that detail risk assessment and mitigation strategies for the project. The following risks are from both applications.

Risk/Issue: Roadway Design

Potential for new signal pole at Cook Street, conceptual design of new Green Spring Road alignment based on 2-foot contour data, potential for existing private road to be brought into VDOT system and up to VDOT design standards

⁶ [Final Concept, Cost, and Risk Meeting:](https://app.mural.co/t/vhbipd8103/m/vhbipd8103/1781099259321/452275a5fcb4431bb66001158c1ee4fc597c86a9)

<https://app.mural.co/t/vhbipd8103/m/vhbipd8103/1781099259321/452275a5fcb4431bb66001158c1ee4fc597c86a9>

Risk/Issue: Bridge Design

Potential existing bridge structure between Cummings St and the Hampton Inn to be adopted into public system and upgraded to meet design standards

Risk/Issue: Right of Way

Potential right of way negotiations and cost/schedule impacts associated with modified property access.

Risk/Issue: Environmental

Based on the desktop environmental review, a noise study will be required due to the proposed intersection improvements at the I-81 westbound off-ramp, and the Veterans Memorial Park is a Section 4(f) resource that could be affected by the addition of the southbound right turn lane at the ALT US 58 (Cummings St) and Cook St intersection.

Risk/Issue: Utilities

The study team identified two utility poles that need to be relocated to accommodate the preferred alternatives. Based on observed above ground appurtenances and available GIS data, there are areas of fiber optic communication lines, overhead power poles, light poles, water, sewer force main and gravity sewer identified to be relocated to avoid impacts with proposed widening, storm drain system, curb and gutter.

Risk/Issue: Drainage

Unforeseen challenges with modifying/replacing stormwater infrastructure, notably the culvert beneath the parking lot where the Green Spring Road extension will connect.

Risk/Issue: Geotechnical

The retaining wall adjacent to the Veterans Memorial Park will need to be removed and a new one will need to be constructed with the addition of the southbound right turn lane at the ALT US 58 (Cummings St) and Cook St intersection.

Risk/Issue: Construction

Need to maintain pedestrian detours and property access. Potential Time-of-Year Restrictions

Risk/Issue: Coordination with Ongoing Projects

The recommendation to install a pedestrian refuge island at Bradley Street is adjacent to the Cummings Street and Remsburg Drive SMART SCALE project. The Cook Street and French Moore Boulevard extension will also occur adjacent to the preferred alternatives in the study area.

Risk/Issue: Additional Issues

True inflation exceeds anticipated inflation applied through Smart Scale and makes project exceed budget.

3.5 Possible Funding Sources

The Town of Abingdon elected to submit the I-81 Exit 17 Southbound Off-Ramp preferred alternative for SMART SCALE funding, which includes the channelized westbound right turn lane at the ALT US 58 (Cummings St) and I-81 Southbound Off-Ramp intersection.

PROJECT PIPELINE

The Bristol MPO elected to submit the Cummings Street Access Management and Turn Lanes preferred alternative for SMART SCALE funding, which includes the installation of a pedestrian refuge island and crosswalk at the Bradley Street intersection, a southbound right turn lane and an additional northbound left turn lane at the ALT US 58 (Cummings St) and Cook St intersection, a median along ALT US 58 (Cummings St) south of Cook Street, the Green Spring Road extension, and a channelized westbound right turn lane at the ALT US 58 (Cummings St) and I-81 Southbound Off-Ramp intersection.