January 2026

2026 VDOT I-81 Corridor Improvement Plan

Final Report

IMPROVE 81

VDOT

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List of Abbreviations

Abbreviation	Description
AADT	Average Annual Daily Traffic
CEI	Construction and Engineering Inspection
CTB	Commonwealth Transportation Board
DRPT	Department of Rail and Public Transportation
EPDO	Equivalent Property Damage Only
FHWA	Federal Highway Administration
NEPA	National Environmental Policy Act
OIPI	Office of Intermodal Planning & Investment
O&M	Operations & Maintenance
PCE	Passenger Car Equivalent
PHD	Person-Hours of Delay
PE	Preliminary Engineering
RITIS	Regional Integrated Transportation Information System
SYIP	Six-Year Improvement Program
TIFIA	Transportation Infrastructure Finance and Innovation Act
VDOT	Virginia Department of Transportation
VMT	Vehicle-Miles Traveled
VSP	Virginia State Police

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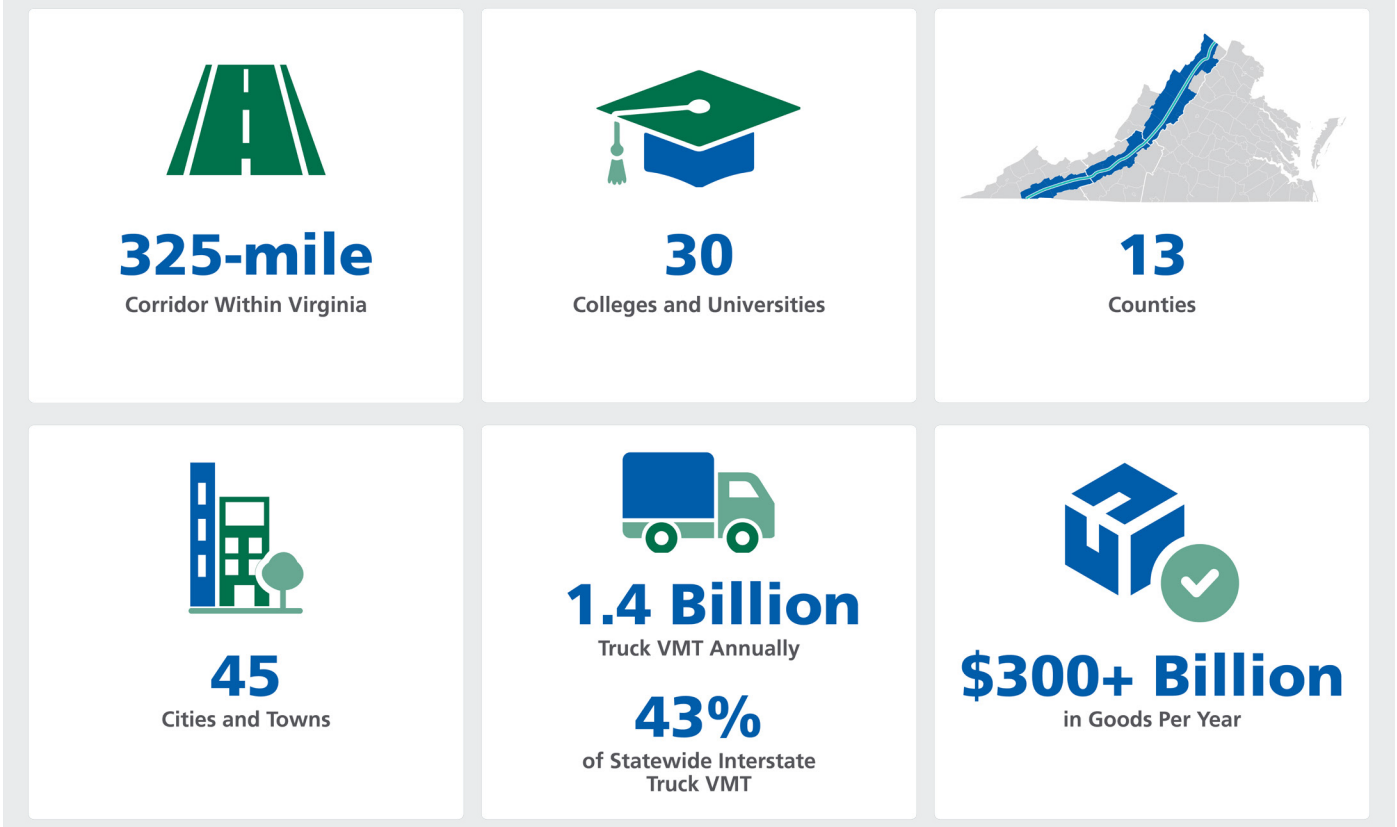
Introduction

Interstate 81 (I-81) is a vital interstate corridor that is critical to the efficient movement of goods and services as well as access to communities and tourism through Virginia. Trucks traveling along the corridor accumulate over 40 percent of all interstate truck vehicle-miles traveled statewide, transporting over 300 billion dollars in goods annually along this 325-mile corridor. As shown in **Figure 1**, I-81 stretches across 45 cities and towns, 13 counties, and 30 colleges and universities throughout Virginia. I-81 is also used by tourists as the corridor runs adjacent to the Blue Ridge Parkway, the most visited national parkway in the nation.

Figure 1: Significance of the I-81 Corridor



The high travel demand in the corridor has caused notable safety and operational issues. Over the past six years, there were on average 2,750 vehicle crashes annually, with approximately one-third involving heavy trucks. This factor causes unpredictable increases in travel delay that negatively impacts both commercial vehicle drivers' on-time performances and passenger car drivers' travel time. As of November 2025, most (509 of the 650 miles or 78 percent) of the corridor is two lanes in each direction; when one lane is blocked, that causes a reduction in capacity. Long crash clearance times are caused by a multitude of factors, including a lack of capacity, rolling terrain, a lack of reliable detour routes, high truck percentage, and narrow shoulders.

As the main travel corridor and key economic artery in western Virginia, I-81 continues to be improved to safely and efficiently accommodate the economic and travel demand growth over time. However, in the past two decades, economic growth along the corridor has increased sharply, leading to a similar increase in traffic and a degradation in the corridor's overall performance. Travel is expected to continue to rise in the future, so it is essential to provide an update to the I-81 improvement plan that will prevent further performance degradation as traffic continues to grow.

2018 Corridor Improvement Plan (CIP)

In 2018, the Virginia Department of Transportation (VDOT) developed the first I-81 Corridor Improvement Plan (CIP). Enactment of Chapter 743 of the 2018 Virginia Acts of the General Assembly required the Commonwealth Transportation Board (CTB) to develop and approve a plan that included an assessment of the entire corridor and options for financing potential improvements. In 2018, the CTB, Office of Intermodal Planning and Investment (OIPI), Virginia Department of Rail and Public Transportation (DRPT), and VDOT conducted public meetings and hearings, received public comments, and identified more than $4.3 billion in recommended improvements along the I-81 corridor. Based on public input, applied prioritization methodology, and available market capacity the plan included a recommendation of $2.0 to $2.5 billion in improvements for 65 projects.

Most of the operational and capital projects from the 2018 CIP are either complete or under development. To guide continued investment in the corridor, a comprehensive update to the CIP commenced in January 2025. The study team sought to determine how traffic conditions have changed on the interstate over the past seven years, focusing on emerging areas with performance issues.

Implementation of the 2018 CIP

The I-81 CIP identified $39 million in operational improvements, in addition to the capital improvement projects, to enhance safety and traffic flow along the corridor. In 2019, the I-81 Program Improvement Fund (33.2-3601) and CIP (33.2-3604) legislative requirements were established, which allowed the 2018 corridor improvement recommendations to advance. By 2021, the CTB adopted the Interstate Operations and Enhancement Program (IOEP) to guide the prioritization and selection of projects based on set performance goals, as referenced in **Appendix A**. Implementation of the I-81 CIP began that same year, and by December 2025, all the operational improvements and 38 of the 65 identified capital projects were completed, with 17 projects under construction.

All planned projects in the 2018 CIP, both operational and capital projects, are anticipated to be completed by 2035 as shown in **Figure 2**.

Figure 2: Status of 2018 CIP Projects

	Project Type	Status	Total Projects	Estimated Completion
Capital	Widening	12	12	2035
	Acceleration/Deceleration Lane Extension	25 / 10	35	2029
	Auxiliary Lane	1 / 3	4	2027
	Truck Climbing Lane	3 / 2	5	2027
	Curve Improvements	9	9	Completed
Operations	Safety Service Patrol Expansion	1	1	Completed
	Towing and Recovery Incentive Program	1	1	Completed
	Camera Installation	42	42	Completed
	Changeable Message Sign Installation	30	30	Completed

Legend: Completed | Programmed

Source: Virginia Department of Transportation, 2025

2026 Corridor Improvement Plan (CIP)

Recognizing that additional enhancements were needed, a comprehensive update to the CIP commenced in January 2025. VDOT, in partnership with OIPI, evaluated I-81 through Virginia to build on the progress made from the 65 programmed improvements in the 2018 CIP. The study update excludes portions of the interstate where widenings or truck-climbing lanes were recently completed or are under development.

Between January and December 2025, the study team conducted five key, interrelated activities.

1. Development and assessment of I-81 performance using established performance measures
2. Determination of contributing factors
3. Outreach to the public
4. Development of potential solutions (operational and capital)
5. Prioritization of capital improvements

Project Identification

Source: VDOT

The first two activities, developing and assessing performance measures and contributing factors, were used in the project identification phase. The process used for evaluating and selecting projects was similar to the approach taken in 2018, but the study team used the most recent available performance measure data collected from 2019 through 2024. Data from 2020 was excluded from the analysis due to the unusual traffic patterns caused by the COVID-19 pandemic, thereby ensuring the most accurate and relevant information was used for project identification. The analysis also excluded areas where widenings were recently completed or in development, to allow adequate time for the benefits of those projects to be determined before additional investment is considered for those areas.

The plan development process began by identifying the top 25 percent of areas along the corridor with issues related to (i) safety, (ii) congestion, and (iii) lane closures lasting more than one hour. Locations to recommend improvements were selected based on data and supplemented by public comments. Capital improvements were prioritized based on scoring how the improvement would increase safety, reduce congestion, and improve job accessibility.

Public Input

The study team received feedback from the public in three rounds of public engagement that took place during the year. Round 1 involved a virtual survey in April and focused on issue identification and validation of performance measures. Round 2 consisted of four public meetings in July at different locations along the corridor, as well as a virtual survey. This round identified potential improvements along I-81 and focused on segments with the highest rate and severity of crashes, or the most significant traffic delays. Round 3 occurred in October and included in person meetings and a virtual survey, focusing on refined solutions that were prioritized using a SMART SCALE-like process.

Source: VDOT

Project Selection

The analysis identified $3 million in immediate operational and incident management improvements (heretofore referred to as operational improvements) and up to $2.25 billion in capital improvements to be implemented within the forecasted available funding.

Operational improvements will be implemented in the corridor following plan approval. Construction of capital improvements will follow the implementation of operational improvements and will be constructed as funding becomes available.

Source: VDOT

Project Funding

As the 2025 CTB considered the next phase of improvements, using forecasted funding for the I-81 CIP, it was determined that up to $2.25 billion in funding would be available for new projects. This substantial investment will support the continued modernization and enhancement of I-81, address ongoing safety and congestion challenges, and ensure that the corridor meets the needs of travelers and communities as it continues to grow in the future.

Understanding the Corridor Today

The study team evaluated existing congestion and safety conditions within the I-81 corridor using data from a variety of sources. This data included travel delays; number and types of crashes; number, types, and durations of incidents; origins and destinations of passenger cars and trucks; and volumes and types of traffic. Four performance measures were used for the primary analysis, along with several additional supplementary analyses. Furthermore, public feedback was collected throughout the study process to validate the performance measures against what is experienced by the driving public on the corridor.

Source: VDOT

Data Analysis

Performance Measures

Based on a review of the available data in the corridor and consistent with the 2018 analysis, the study team selected four performance measures to evaluate the most significant congestion and safety issues throughout the corridor.

The four performance measures were:

- **Crash severity:** the total number of crashes, weighted by severity using the equivalent property damage only (EPDO) scale[1]
- **Crash frequency:** crash severity per 100 million vehicle-miles traveled
- **Person-hours of delay:** the total person-hours of delay caused by the impacts of congestion, incidents, and weather events
- **Incident delay:** the total person-hours of delay caused by incidents (crashes and disabled vehicles) that led to closure of at least one lane of the interstate for an hour or more

Crash data was obtained from the VDOT Roadway Network System (RNS) and the VDOT Traffic Monitoring System (TMS). The delay data was obtained from INRIX and incident delay data came from the Regional Integrated Transportation Information System (RITIS). The team collected data for the five-year period encompassing 2019 and 2021 to 2024. The year 2020 was not included in the analysis due to the abnormal traffic patterns related to the COVID-19 pandemic. Crash data was analyzed for each unique one-mile segment. Delay data availability was limited to segments between each set of interchanges; thus, while applicable to the one-mile segments between those interchanges, is not specific to each individual segment.

1. The Equivalent Property Damage Only scale uses the KABCO crash-rating system, developed by the Federal Highway Administration, which weights fatal and serious injury (K and A) crashes as 170 points, B (minor injury) crashes as 20 points, C (possible injury) crashes as 10 points, and property damage only (O or PDO) crashes as 1 point. This scoring allows a segment with two fatal crashes to be compared to one with two PDO crashes.

To compare performance measures throughout the corridor, the interstate was divided into 650 one-mile segments, based on the VDOT linear referencing system (325 miles northbound and 325 miles southbound). The length of corridor in each VDOT district, from south to north, is detailed in **Table 1.**

Table 1: Centerline Miles in Each District

District	Length (miles)
Bristol	88
Salem	87
Staunton	150
Total	**325**

The study team then calculated the crash and delay measures fora each one-mile segment.

Segments where a widening or truck climbing lane (identified during the 2018 CIP) were constructed or programmed were excluded from the analysis ranking to allow adequate time for the benefits of those projects to be determined before additional investment is considered for those areas.

Each segment was ranked to determine the top 25 percent worst performing segments, i.e. those segments with the most crashes or delay per the CTB IOEP policy (CTB IOEP Policy - June 2021). This set of top 25 percent of segments was used to determine which areas should be reviewed for potential improvements.

Performance Measure Results

Histograms were generated for each performance measure, to better compare the values across the entire corridor and by direction of travel. Locations where widening or a truck climbing lane were previously constructed or programmed were excluded from the histogram. The overlaps with I-77 and I-64 are also noted. The black dashed line on the histograms indicates the cutoff for the top 25 percent; any bar that exceeds this value is within the top 25 percent. The histograms are shown in **Appendix B**. **Table 2** summarizes the number of one-mile segments in the top 25 percent by performance measure and by VDOT district. Note that there are segments where multiple performance measures are present: crash severity and frequency as well as delay. The Staunton district has many more segments since the corridor is double the length of the sections of the corridor in the Bristol and Salem districts.

Table 2: Number of One-Mile Segments in the Top 25 Percent by Performance Measure

Milepost	District	Crash Severity	Crash Frequency	Person Hours of Delay	Incident Delay
0-88	Bristol	38	48	8	2
88-175	Salem	27	29	28	18
175-325	Staunton	66	54	95	113

Supplementary Analyses

The study team collected and analyzed additional data to supplement the four performance measures for the identification of problem areas and project identification. The supplementary data included the following:

- **Speeds.** INRIX data was collected in 15-minute intervals to summarize average speed patterns and variability in speeds throughout the corridor per time of day, day of week, and time of year for 2023 and 2024.
- **Origins and destinations.** StreetLight data was used to summarize origin-destination patterns on I-81. AM and PM peak hours were compared for Tuesday through Thursday, Friday, Saturday, and Sunday. Truck trips were also reviewed.
- **Continuous traffic counts.** Traffic volume data was provided by VDOT in 15-minute intervals at various locations throughout the corridor and was used to identify peak hours.
- **Incidents.** 511 data was collected and summarized as additional incident data, including the number of total or lane-impacting incidents and the average time to clear a lane or scene.

This information was used to help identify specific countermeasures at various locations along the corridor.

Public Outreach

Public participation was actively incorporated during the formulation of the CIP and played a vital role in shaping the final plan. The study team used the website, improve81.org, to provide information and gather public input. In addition, an email address was established for receiving comments and the project manager's phone number was made available. Material presented at all the public meetings is also available on the website.

Three rounds of public engagement were held between April and October 2025. In April 2025, the public provided input on Issue Identification through a virtual survey. Issue Identification focused on understanding if the performance measure evaluation aligned with the public perception of various locations of the corridor and served as a validation of the data. In July 2025, four public meetings were held throughout the corridor, focusing on the identified potential improvements on segments with the highest rate and severity of crashes, or the most significant traffic delays. Round 3 of public involvement consisted of four public meetings in October 2025 throughout the corridor and presented refined solutions that were prioritized using a SMART SCALE-like process.

Source: VDOT

During the public input rounds, attendees were able to view maps of the corridor in their respective area; listen to a presentation about the project and its progress; identify problem areas; ask questions; and submit comments and suggestions. The display boards and presentations also were made available on the project website.

An online survey tool was used to obtain feedback from the public for each of the three rounds of public input. The study team used comments provided to inform the identification and verification of problem areas in the corridor and develop proposed improvements for consideration. The virtual survey was open for at least 14 days for each round and, when used in coordination with in-person meetings, was available in advance of the first meeting. Public meeting materials can be found in **Appendix C** and summaries of public comments can be found in **Appendix D.**

Public Outreach Results

Round 1 Meetings Summary

During the first public meeting, participants placed 'pins' on maps to indicate areas where they encountered issues such as congestion, safety, and heavy traffic volumes. **Table 3** summarizes the key themes from Round 1 of public outreach in the Bristol, Salem, and Staunton districts.

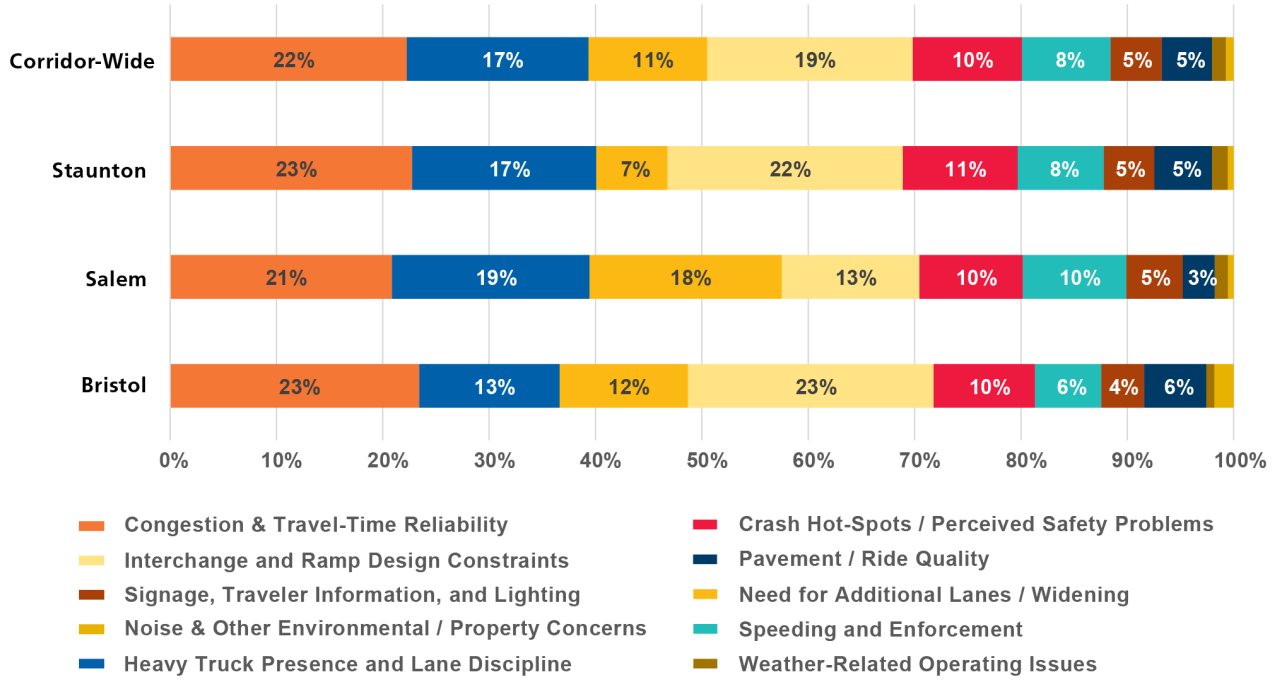
In addition to placing pins on a map, respondents were also able to provide written comments. Approximately 4,000 comments from 4,700 participants were received from the online survey for the first round of public meetings.

Those comments were analyzed to determine the top themes by district. **Figure 3** summarizes the key themes from Round 1 of public feedback in the Bristol, Salem, and Staunton districts. Like the map pins, the top issue raised in the written comments across all districts was congestion, followed by heavy truck presence and interchange constraints.

Table 3: Public Outreach Round 1 Map Pins by Issue Type (in percent)

Issue Type	Bristol	Salem	Staunton	Total
1. Congestion	36	31	42	39
2. Truck Operations	25	26	20	22
3. Safety	18	16	23	21
4. Speeding and Aggressive Driving	10	16	9	10
5. Geometry	5	7	3	4
6. Pavement Markings and Signing	3	1	2	2
7. Other	2	3	1	2

Figure 3: Summary of Round 1 Public Feedback Themes



Round 2 Meetings Summary

At the second round of public meetings, respondents were asked to review potential solutions to the top 25 percent problem areas and to indicate their support for proposed recommendations. VDOT held four in-person meetings throughout the corridor, with approximately 100 participants. Additionally, the virtual engagement feedback form received 1,136 comments from 1,674 participants. Participants were able to review a series of boards showing potential solutions throughout the corridor along with the performance measures on each one-mile segment. A majority of participants (87 percent) agreed with the proposed potential solutions.

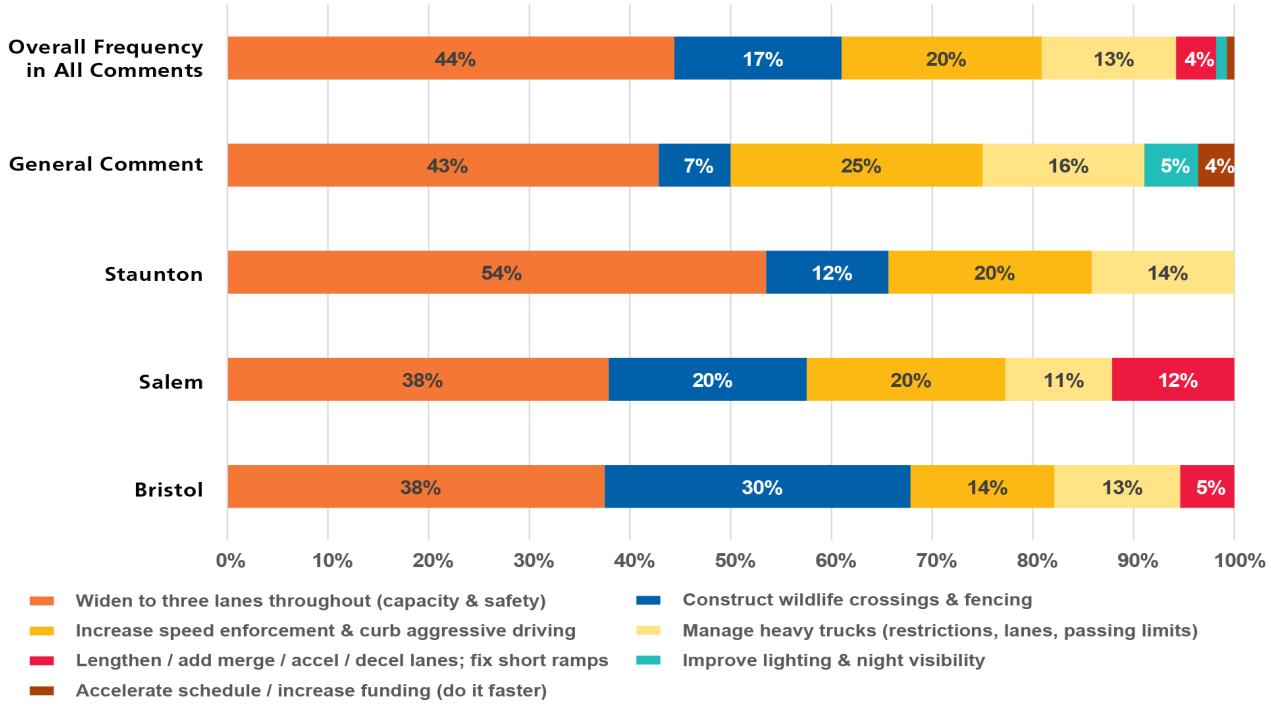
In the written comments, there were over 100 mentions of speeding and enforcement, over 90 mentions of widening to three lanes, and over 30 mentions of truck management. Across the comments in all three districts, the most common themes were interchange and ramp geometry weaving issues and recurring traffic congestion and backups.

Round 3 Meetings Summary

The third round of public input focused on the Staff Recommended Funding Scenario that depicted which of the potential solutions were suggested for funding and advancing to construction in the next round of projects in the plan. There were 96 comments received on projects within the Bristol district, 105 comments on projects within the Salem district, and 117 comments on projects within the Staunton district. Additionally, there were 53 general comments and 40 comments sent to the I-81 email inbox.

Figure 4 summarizes the comments received in the third round of public input. Support for widening to three lanes was the most common comment throughout the corridor. Additionally, 45 commenters requested wildlife crossings or fences be considered. Speed enforcement and managing heavy trucks were the two other most common themes from the comments.

Figure 4: Summary of Round 3 Public Feedback Themes



Additional Outreach

The CTB was updated over the life of the study to track the progress of the study and ask questions of the study team. The purpose of these meetings was to:

- Keep the decision-making board informed of progress on the plan
- Provide an opportunity for questions and answers on specific aspects of the plan
- Receive guidance on the plan development

Each presentation is available on the CTB website at www.ctb.virginia.gov.

The I-81 Advisory Committee was also briefed in December 2024, July 2025, and December 2025 so that members were informed of progress on the update and allow them to provide feedback as work progressed and ultimately provide a recommendation to the CTB for the final CIP funding scenario.

Targeted Improvements Development

The study team developed targeted solutions following the calculation of key segments with performance measure issues along the corridor, the validation of the performance data identified by the public in each district, and the subsequent performance analysis results. The plan proposes a comprehensive suite of improvements to address performance issues and contributing factors that improve reliability of I-81. The solutions included two types of improvements: operational and capital. Both types of improvements are necessary to address problems in the corridor.

Operational Improvements

Operational Improvements target the systems that support smooth traffic flow along the corridor, such as special signal timing plans along parallel routes to accommodate detoured traffic during I-81 incidents. Because most of the operational improvements identified in the 2018 CIP have been implemented, the focus of operational solutions for the 2026 CIP was on improving the efficiency of the traffic signals to serve additional traffic volume detoured during I-81 incidents.

Roadways parallel to I-81 often serve as alternate routes for travelers when there are incidents on the interstate, particularly those incidents requiring lane closures on I-81. These improvements included recommendations for developing retiming plans for traffic signals, incident signal timing plans, and the addition of Automated Traffic Signal Performance Measures (ATSPM) for traffic signals on detour routes as described in more detail below. In the City of Harrisonburg, recommended upgrades included an adaptive traffic signal system that could accommodate detoured traffic onto parallel facilities within the city and maintain operational standards on the city's street network.

- **Traffic signal retiming:** optimize traffic signal timings to reduce delays and increase traffic flow
- **Incident management timing plan:** A strategic traffic signal timing plan that allows the detour of traffic to efficiently flow through the corridor when an incident occurs on the interstate
- **Automated Traffic Signal Performance Measures (ATSPM):** A system that collects and analyzes data from traffic signals to evaluate performance, identifying issues and improving traffic signal timing efficiency

These operational improvements would provide daily benefits to localities and travelers along the parallel facilities. The recommended traffic signal upgrades address existing safety concerns, crash patterns, and travel time issues. Enhanced signal equipment and communications will improve day-to-day operations and optimize traffic progression along these corridors. **Table 4** summarizes the number of traffic signal locations proposed for improvement in each district and identifies the corresponding signal owners.

Table 4: Number of Traffic Signals Recommended for Improvements

Traffic Signal Owner	Bristol District	Salem District	Staunton District	Total
VDOT	20	29	53	102
Locality	48	36	33	117
Total	**68**	**65**	**86**	**219**

Capital Improvements

Once the top 25 percent performance locations were validated by the public, the study team considered additional contributing factors to assist in the development of capital improvement recommendations. The following five contributing factors were evaluated:

1. **Traffic volume:** traffic volumes were considered high when peak traffic volumes exceeded 1,700 passenger car equivalent (PCE) vehicles per hour per lane. Traffic volumes were derived from published 2024 VDOT ADT traffic volumes and a factor of 1.7 was used to convert heavy commercial vehicle volumes to PCE volumes. No adjustment for grade was used for determining PCE volumes.
2. **Grade:** contour elevations for the I-81 corridor were evaluated to determine areas with steep grades
3. **Curvature:** areas with tight horizontal curves were noted using aerial and street-level imagery
4. **Ramp spacing:** locations where the distance between an on-ramp and the next off-ramp was less than two miles
5. **Merge/diverge area:** locations where an acceleration and/or deceleration lane length was less than 1,300 feet

A combination of performance measures and contributing factors led to the development of 41 potential capital improvements throughout the corridor with an estimated cost of over $7 billion.

The study team considered performance measures, the presence of contributing factors, and public input to develop potential capital improvement solutions. The team reviewed:

- **projects already funded in the Six-Year Improvement Program (SYIP)** to determine how those projects may help improve conditions in the corridor
- **recently constructed projects** to determine how those projects may resolve issues in the corridor
- **crashes and delays** that may have been due to construction work zones.

The study team reviewed crash data for the entire corridor in both directions to determine where the highest crash frequency and crash severity occurred. Descriptions from crash reports were used to determine the cause of crashes and what, if any, solutions could mitigate the crash pattern. Crashes involving vehicles changing lanes, sideswipes, and rear-end collisions, and in some cases running off the road may be linked to deficiencies in the roadway that could be mitigated by geometric improvements. Crash patterns linked to behavioral issues, such as driver inattention or mechanical failure, cannot be remedied by changes to the roadway.

The study team recommended the following types of capital improvements in the corridor based on the prevailing crash types and contributing factors (e.g., traffic volume, geometrics, and ramp spacing) for evaluation:

- **Auxiliary lane:** an extra lane constructed to connect on- and off-ramps between closely spaced interchanges to reduce the impacts of traffic entering and exiting the interstate
- **Widening by one lane:** a new lane, typically constructed within the existing median, for multiple miles to increase the capacity of the interstate
- **Acceleration and deceleration lane extension:** more space for drivers to accelerate when entering the interstate and decelerate when exiting the interstate
- **Curve improvement:** superelevation improvements in curves to reduce the potential for run-off-the-road crashes
- **Realignment:** adjusting the alignment of the roadway to remove or reduce horizontal curvature
- **Truck climbing lane:** an extra lane on steep grades to encourage the separation of trucks from other vehicles

Recommendations selected to advance to construction will undergo further analysis and consideration to account for the many historic and natural resources in the I-81 corridor. During the preliminary engineering phase of project development when environmental impact analyses are conducted, the potential impacts of proposed improvements on these resources must be carefully evaluated. The potential impacts of proposed improvements on natural resources along the I-81 corridor were not evaluated as part of this study.

Before any improvements are advanced further, there will be comprehensive environmental review and permitting processes conducted to meet both federal and state requirements (such as those under the National Environmental Policy Act (NEPA), Clean Water Act, Clean Air Act, and Endangered Species Act). These processes may result in certain projects not being advanced as initially proposed or substantially modified to avoid or mitigate adverse impacts.

Corridor Improvements Cost Estimates

To facilitate the analysis and prioritization of recommended operational and capital improvements, planning level cost estimates for each individual improvement were developed.

Operational Improvements

The operational improvements have an estimated implementation capital cost of about $3 million, which does not include ongoing operations and maintenance (O&M) costs. **Table 5** shows the details of the estimated capital cost for traffic signal upgrades for parallel routes along the I-81 corridor.

Table 5: Proposed Operational Improvements

Proposed Operational Improvement	Capital Cost
Traffic Signal Upgrades	**$2.2M**
Traffic Signal Retiming	$1.5M
Incident Management Timing Plan	$279K
ATSPM	$465K
Adaptive Traffic Signal System	**$765K**
Total	**$3.0M**

No O&M costs were included in these cost estimates

Mainline Roadway Improvements

Planning level cost estimates were developed by the study team. Recent construction contract bid costs per mile or cost per unit were established to assist in the development of costs for linear improvements such as widenings, truck climbing lanes, and auxiliary lanes. A summary of per mile and per unit line-item costs was created to estimate the construction costs for the capital improvements.

Using assumed unit construction costs, each linear improvement was segmented at bridges, interchanges, or other identifiable landmarks (such as locations of inside widening, outside widening, or partial inside and outside widening). The appropriate costs per mile or unit were then applied to each segment to develop a total construction cost for each improvement. In a few cases, VDOT staff provided individual cost estimates for bridges based on project development. For the non-linear improvements, such as acceleration and deceleration length extensions, and curve improvements, the construction costs were developed using a combination of the VDOT Project Cost Estimating System and unit cost breakdowns from historical bid tabulation data, recent construction bids, and the Statewide Planning Cost Estimate tool.

Once the construction costs for each improvement were determined, the study team developed estimates for preliminary engineering, construction engineering and inspection (CEI), and right-of-way and utilities using a percentage of the construction cost, which is consistent with VDOT recommended project cost estimating methodology.

Funding

Chapters 837 and 846 of the 2019 Acts of Assembly established Chapter 36 (§ 33.2-3600 et seq.) of Title 33.2 of the Code of Virginia, created the I-81 Corridor Improvement Fund (Fund), and directed the CTB to adopt an I-81 Corridor Improvement Program to be updated by July 1 of each year.

Dedicated funding for the I-81 Program is deposited in the Fund, which includes regional fuels tax along the I-81 corridor and a share of statewide revenues from IOEP allocations. The IOEP allocations for I-81 are equal to the ratio of vehicle-miles traveled (VMT) on I-81 by Class 6 (three-axle, single unit truck) or higher to total VMT on all interstates in Virginia as shown in **Table 6**. VMT data in the chart is provided in December of each year to inform assumptions for the subsequent fiscal year.

Table 6: I-81 VMT Percent of Statewide VMT by Fiscal Year

Fiscal Year	I-81 Share of Truck VMT
2023	43.5
2024	43.7
2025	43.9

Since the 2024 Appropriation Action (Item 438(M)), the CTB is authorized to advance preliminary engineering and right-of-way activities prior to full funding for construction of projects in the Program as adopted by the CTB. This flexibility was granted because of the dedicated funding for the I-81 corridor and is needed to advance complex projects and reduce the impacts of cost inflation over time.

For the 2026 CIP, annual revenues for the I-81 Corridor Improvement Fund are forecast to be approximately $200-250M for the foreseeable future. To develop a constrained list of projects for the CIP update, 10 years of revenues were assumed to provide a budget amount of $2.25B. In the coming years, revenues will continue to be applied to the expenditures necessary to complete the remaining programmed 2018 CIP projects (2035 target year for completion). Additional revenues will be programmed to the CTB-approved 2026 CIP funding scenario as they become available. For more information about annual remaining revenue capacity, please review the January 2026 CTB presentation of the I-81 CIP Update.

Prioritization of Improvements

The improvement prioritization process was a three-step process starting with a ranking of projects based on a SMART SCALE-like prioritization, followed by the development of a staff recommended funding scenario, and ending with a consensus funding scenario.

SMART SCALE-Like Prioritization

For statewide transportation funding in the Commonwealth of Virginia, prioritization is an objective and quantifiable analysis that considers added benefit in terms of congestion mitigation, accessibility, and safety, divided by the requested funding. This process, commonly known as SMART SCALE, was implemented by the CTB in 2015.

Following the same process used in the 2018 CIP, a SMART SCALE-like process that focused on the most relevant benefits was used to prioritize capital projects. The operational improvements were assumed to be a stand-alone fundamental plan element and were excluded from the prioritization process.

The following three SMART SCALE measures, and associated weightings, were used in the I-81 prioritization process:

- **Safety:** reduction in the number of fatal and injury crashes (40 percent)
- **Congestion mitigation:** decrease in person-hours of delay (40 percent)
- **Accessibility:** access to jobs (20 percent)

The basic project components required for the plan prioritization process were improvement type (such as widening, auxiliary lane, acceleration/deceleration lane extensions), location and length of improvement, and project cost. As required by SMART SCALE, the prioritization process incorporates identified improvement benefits relative to project cost and compares I-81 project recommendations against other potential I-81 project recommendations throughout the corridor.

Like SMART SCALE, once the cost estimates were completed the recommended capital improvements were selected based on sorting by the highest benefit-cost score. A SMART SCALE-like prioritization list was developed based on prioritization rank and includes all the projects that could be funded within the anticipated $2.25 billion available for new projects. The SMART SCALE-like prioritization list can be found in **Appendix E**.

Staff Recommended Funding Scenario

Following the completion of the SMART SCALE-like prioritization process, the study team reviewed the list of ranked projects to identify areas where the incorporation of new projects, along with those recently completed or in development, may cause operational issues. Two types of operational issues were identified by the team:

- **Hourglass effect:** a short two-lane segment (four miles or less) between two three-lane segments, requiring drivers to merge unexpectedly
- **Projects in the vicinity of a system-to-system interchange:** additional consideration is needed in areas leading to interchanges between two interstate systems, as those areas typically incorporate a variety of movements with high traffic volumes

Two areas of concern were identified by the study team as having the potential to create operational issues. To mitigate those issues, the study team adjusted the project list accordingly. This revised list is the Staff Recommended Funding Scenario and can be found in **Appendix F**.

Consensus Funding Scenario

The development process for this plan initially identified 41 projects for consideration. After the prioritization process, receipt of additional public input, feedback from the I-81 Advisory Committee, and presentation of the Staff Recommended Funding Scenario, the CTB approved the report summary with the Consensus Funding Scenario.

Information about the CTB's decision, including the adopted resolution and meeting minutes, is available on the CTB website at www.ctb.virginia.gov.

As a result, a total of 22 projects were prioritized for funding, totaling up to $2.25 billion. This Consensus Funding Scenario represents the CTB's priorities out of the 41 projects initially identified for consideration in the three VDOT districts.

- **Bristol District:** 6 projects estimated at **$410-501** million
- **Salem District:** 3 projects estimated at **$300-462** million
- **Staunton District:** 13 projects estimated at **$1.1-1.6** billion

A summary of the recommended capital improvements by project type and district is included in **Table 7**. Each district improvement is summarized in **Table 8, 9,** and **10** for Bristol, Salem, and Staunton districts, respectively.

The recommended projects consider the projects already in the Six-Year Improvement Program (SYIP). **Appendix G** and **Appendix H** contain maps and tables depicting the Consensus Funding Scenario.

The S-Curve improvement project in Botetourt County was identified for priority funding by the Governor and adopted by the CTB to be fully funded at their November 10, 2025 meeting. This project was added to the VDOT CTB SYIP.

Table 7: Number of Proposed Projects by Type

District	Widening	Auxiliary Lane	Truck Climbing Lane	Acceleration Lane Extension	Deceleration Lane Extension	Total Number of Projects	Total Cost (millions of dollars)
Bristol	1	1	-	4	-	6	$410-501M
Salem	-	-	2	1	-	3	$300-462M
Staunton	7	1	-	4	1	13	$1.1-1.8B
Total I-81 Corridor Number of Improvements	**8**	**2**	**2**	**9**	**1**	**22**	**$1.6-2.6B**

Table 8: Summary of Capital Improvements – Bristol District

Improvement Description	County	Mile Marker From	Mile Marker To	Direction	Corridor Prioritization Rank
Acceleration Lane Extension	Washington	25.1	25.7	NB	2
Acceleration Lane Extension	Washington	29.5	30.1	NB	3
Auxiliary Lane	Washington	4.5	5.0	NB	7
Acceleration Lane Extension	Washington	19.9	20.2	NB	11
Acceleration Lane Extension	Washington	24.8	24.4	SB	20
Widening (+1 Lane)	Washington	9.9	14.9	NB/SB	22
Bristol District Total Recommended Improvement Costs					**$410-501M**

**Includes PE (Preliminary Engineering), RW (Right-of-Way and Utilities), and CO (Construction)*

Table 9: Summary of Capital Improvements – Salem District

Improvement Description	County	Mile Marker From	Mile Marker To	Direction	Corridor Prioritization Rank
Acceleration Lane Extension	Botetourt	162.1	161.0	SB	6
Truck Climbing Lane	Pulaski	104.9	103.4	SB	15
Truck Climbing Lane	Montgomery	106.0	110.5	NB	16
Salem District Total Recommended Improvement Costs					**$300-462M**

**Includes PE (Preliminary Engineering), RW (Right-of-Way and Utilities), and CO (Construction)*

Table 10: Summary of Capital Improvements – Staunton District

Improvement Description	County	Mile Marker From	Mile Marker To	Direction	Corridor Prioritization Rank
Acceleration Lane Extension	Rockingham	251.1	250.7	SB	1
Acceleration Lane Extension	Shenandoah	265.2	265.5	NB	4
Deceleration Lane Extension	Frederick	307.5	307.3	SB	5
Acceleration Lane Extension	Augusta	227.8	228.1	NB	8
Acceleration Lane Extension	Shenandoah	268.4	269.1	SB	9
Auxiliary Lane	Augusta	220.8	221.5	NB	10
Widening (+1 Lane)	Augusta	221.7	217.0	SB	12
Widening (+1 Lane)	Augusta/Rockingham	237.2	242.2	NB/SB	19
Widening (+1 Lane)	Shenandoah	296.8	298.6	NB	21
Widening (+1 Lane)	Rockbridge	202.2	204.8	NB	23
Widening (+1 Lane)	Rockbridge	190.5	195.7	NB	29
Widening (+1 Lane)	Shenandoah	298.6	300.3	NB	30
Widening (+1 Lane)	Frederick	310.6	313.3	NB	34
Staunton District Total Recommended Improvement Costs					**$1.1-1.6B**

**Includes PE (Preliminary Engineering), RW (Right-of-Way and Utilities), and CO (Construction)*

Improvements and Locations Requiring Further Study

In concert with input from the VDOT districts, the study team also identified several areas where improvements necessary to resolve performance measure issues required additional analysis that went beyond the scope of this study. These locations, shown in **Tables 11, 12,** and **13**, were not advanced to project prioritization since there was insufficient information to evaluate the projects.

Table 11: Additional Areas of Study – Bristol District

Description	Exit(s)
Analyze interchange at US 58 and US 421 (Gate City Highway) for potential operational, safety, and/or configuration improvements. [City of Bristol]	1
Study the need for widening northbound and southbound between Exit 14 (Routes 19 / 11 | Lee Highway) to Exit 22 (Enterprise Road) to improve congestion and safety. [Washington County | Town of Abingdon]	14 - 22
Study the need for a northbound auxiliary lane from Exit 70 (N 4th Street) to Exit 72 (I-77 to WV) to improve safety. [Wythe County | Town of Wytheville]	70 - 72

Table 12: Additional Areas of Study – Salem District

Description	Exit(s)
Analyze interchange at US 11 (Lee Highway) and Route 100 (Wysor Rd) for potential operational, safety, and/or configuration improvements. [Pulaski County]	89
Analyze interchange at Route 99 (Count Pulaski Dr) for potential operational, safety, and/or configuration improvements. [Pulaski County]	94
Widen to three lanes in each direction. [Roanoke County]	143
Analyze interchange at US 11 (Lee Highway) to improve safety. [Botetourt County]	162

Table 13: Additional Areas of Study – Staunton District

Description	Exit(s)
Analyze interchange at US 11 (Lee Highway) for potential operational, safety, and/or configuration improvements. [Rockbridge County]	180
Analyze interchange at US 60 (E. Midland Trail) for potential operational, safety, and/or configuration improvements. [Rockbridge County]	188
Analyze interchange at US 11 (Lee Highway) for potential operational, safety, and/or configuration improvements. [Augusta County]	213

Next Steps

The three VDOT districts will review the scope, schedule, anticipated cost, and risks for each project to begin developing a schedule for program development. This process may consist of conceptual design, risk assessment, preliminary schedule development, and project delivery prioritization.

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Appendices

A. Interstate Operations and Enhancement Program Policy

B. Performance Measures Data

C. Public Meeting Boards: April, July, October

D. Public Meeting Comments Summary

E. Improvement Prioritization Scoring Results

F. Staff Recommended Scenario

G. Consensus Funding Scenario Plan Boards

- Bristol District
- Salem District
- Staunton District

H. Consensus Funding Scenario Tables

IMPROVE **81**

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