



COMMONWEALTH *of* VIRGINIA

DEPARTMENT OF TRANSPORTATION
1401 EAST BROAD STREET
RICHMOND, VIRGINIA 23219 2000

Charles A. Kilpatrick, P.E.
Commissioner

December 15, 2015

Members of the General Assembly

Dear Ladies and Gentlemen:

Pursuant to Item 427 L1-2 (Item 427 L) of Chapter 2 of the 2014 Acts of Assembly (Special Session I), the Commonwealth Transportation Board (CTB) was required to direct the staff of the Virginia Department of Transportation's Bristol, Salem and Staunton districts to develop a list of project improvements to address congestion and safety concerns along the Interstate 81 corridor as part of the statewide prioritization process enacted by the 2014 General Assembly pursuant to § 33.2-214.1 of the *Code of Virginia*. Further, Item 427 L provides that the CTB give priority to projects that minimize impacts on adjacent communities, such as historic battlefields, and to projects that can be implemented within the existing right-of-way or with minimal additional right-of-way.

Item 427 requires, by January 1, 2016, a final list to be developed pursuant to the provisions of House Bill 2 of the 2014 Session of the General Assembly (HB2) that identifies the prioritized candidate projects identified for potential inclusion in the Six Year Improvement Program to be adopted by the CTB in June 2016. The final report required by Item 427 L is attached along with the resolution of the Commonwealth Transportation Board authorizing submission of the report. It is noted that Item 427 L. was enacted before HB2 was implemented and based on the implementation timeline of HB2, the I-81 projects could not undergo HB2 prioritization by the deadline for this report. A list of projects set out in the report was generated utilizing various factors described in the report and in the meantime, 14 applications for projects related to I-81 were submitted by entities pursuant to the HB2 process. Those 14 projects, which address entire projects or portions of projects on the project list developed pursuant to Item 427 L, are currently undergoing prioritization pursuant to the HB2 process, the results of which are anticipated to be available later in 2016.

If you have any questions or need additional information, please contact me.

Sincerely,

A handwritten signature in blue ink, appearing to read "C. Kilpatrick", written over a horizontal line.

Charles A. Kilpatrick, P.E.
Commissioner of Highways

Attachment

cc: The Honorable Aubrey L. Layne, Jr.

FINAL REPORT: LIST OF CORRIDOR PROJECTS ALONG
THE INTERSTATE 81 TO ADDRESS SAFETY AND
CONGESTION

Pursuant to:

Item 427 L of Chapter 2, 2014 Acts of the Assembly (Special Session I)

Commonwealth Transportation Board
and
Virginia Department of Transportation

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Executive Summary

Pursuant to Item 427 L 1 and 2 (Item 427 L) of the 2014 Appropriation Act, the Commonwealth Transportation Board (CTB) was required to direct the Virginia Department of Transportation's (VDOT) Bristol, Salem and Staunton districts to identify projects along the I-81 corridor in Virginia that address safety and congestion concerns as part a statewide prioritization process pursuant to § 33.1-23.5:5¹ of the *Code of Virginia* (See Appendix A). Item 427 L further requires the CTB to solicit input from local elected officials, state legislators, and other affected stakeholders in the identification of potential candidate projects for evaluation. The CTB is to give priority to projects that minimize the impacts on adjacent communities, such as historic battlefields, and to projects that can be implemented within the existing right-of-way or with minimal additional right-of-way.

An interim report including a list of safety and congestion projects and estimated costs from the FY 15-20 Six Year Improvement Program was completed in November 2014 and provided to members of the Virginia General Assembly in December 2014. This final report, required by Item 427 L, contains a list of projects developed using factors described in the report.

In April 2015, the VDOT Bristol, Salem and Staunton District Offices developed a candidate project list that contained 105 recommendations totaling approximately \$6 billion. Subsequently, a series of four meetings was held throughout the corridor for the purpose of obtaining input from local elected officials, state legislators and other affected stakeholders relating to issues and deficiencies along the corridor. These meetings commenced in June of 2015, with the first being hosted by the Secretary of Transportation, and culminated with a final meeting in September.

The 105 project list was later revised, utilizing factors further described in this report, to a list of 41 smaller break-out projects totaling approximately \$1.5 billion. VDOT District staff coordinated with the MPOs, PDCs, and local governments along the I-81 Corridor while developing these 41 candidate projects. Project categories included:

- Bridges / Structures
- Acceleration / Deceleration
- Interchange Modifications
- Intelligent Transportation Systems (ITS)
- Pavement Reconstruction
- Safety

¹ Section 33.1-23.5:5 was enacted into law pursuant to HB2 of the 2014 General Assembly. As a result of legislation recodifying, among others, Title 33.1, §33.1-23.5:5 was recodified as §33.2-214.1, effective October 1, 2014.

- Mainline Widening
- Truck Climbing Lanes

The list of projects was shared with the Metropolitan Planning Organizations (MPOs), Planning District Commissions (PDCs), and localities for consideration as part of the HB2 application submittal process for potential inclusion in the Six Year Improvement Program to be adopted by the CTB in June 2016. This list of projects has been presented and reviewed by State Legislators, MPOs, PDCs, and localities along the I-81 corridor. Their comments and their cost adjustments were taken into consideration in preparing the list as set out in Appendix B.

Also, a list of the final candidate HB2 projects submitted by the September 30, 2015, deadline by the eligible stakeholders has been provided in Appendix C. A total of fourteen I-81 candidate projects were submitted corridor-wide under the HB2 process with an estimated value of \$492 million. Due to the mandate of Item 427 L1-2 (Item 427 L) of Chapter 2 of the 2014 Acts of Assembly (Special Session I), that a final report be submitted by January 1, 2016, the results of the screening and scoring are not included in this report as the HB2 screening and scoring is not anticipated to be completed until sometime in January 2016.

Findings

Along 325 miles of Interstate 81 in Virginia from West Virginia to Tennessee, a total of forty-one projects were identified for purposes of this report. Many of the projects can be broken into smaller projects of independent utility or are a subset of a larger mainline widening or interchange project.

VDOT maintains a list of Statewide Transportation Planning recommendations and that list will be updated with the projects in this report as appropriate.

A summary of the total number of projects being recommended as potential candidate projects in each category with low and high cost ranges is included in the table below:

Category	Total No. Projects (I-81 Corridor)	Total Cost Range (Corridor)(Millions)(Rounded)	
		<i>Low</i>	<i>High</i>
Bridge	8	173	254
Capacity – Widening	5	380	581
Capacity - Interchange Modification	5	187	286
Pavement	10	222	342
Safety	10	197	302
Safety / ITS	3	7	11
TOTALS	41	1,166	1,776

Introduction

The Commonwealth Transportation Board (CTB) is required by Item 427 L of the 2014 Appropriation Act to direct VDOT's Salem, Bristol and Staunton district staff to develop a prioritized list of congestion relief and safety improvement projects along the I-81 corridor as part of the statewide prioritization process pursuant to § 33.1-23.5:5 of the *Code of Virginia*² (HB2, 2014). Item 427 L further requires the CTB to solicit input from local elected officials, state legislators, and other affected stakeholders in the identification of potential candidate projects for evaluation. Further, the CTB is to give priority to projects that minimize the impacts on adjacent communities, including historic battlefields, and to projects that can be implemented within the existing right-of-way or with minimal additional right-of-way.

Pursuant to Item 427 L, a final list of projects must be developed pursuant to the provisions of HB 2, 2014 Session of the General Assembly,) and must list the prioritized candidate projects identified for potential inclusion in the SYIP to be adopted by the CTB in June 2016. Given that project prioritizations under the HB2 prioritization process are currently in progress, the results of the HB2 analysis and prioritization were not available for publication of this report but will be considered for purposes of the final list of projects that must be developed pursuant to Item 427 L. The prioritized list of potential candidate projects from this document will be available by June 2016.

This report constitutes the final report required by Item 427 L and provides a list of projects (included in Appendix B) derived from analysis conducted by VDOT's Bristol, Salem and Staunton District Offices. Meetings were held in each of the three VDOT districts along the I-81 corridor where State Legislators, Metropolitan Planning Organizations (MPO), Planning District Commissions (PDC), and localities were given the opportunity to review and comment on the potential candidate projects.

Study Area

The study area includes 325 miles of Interstate 81, beginning at the Tennessee/Virginia State Line and continuing to the West Virginia/Virginia state line. Within the study area are 90 interchanges including connections with I-66, I-64, I-581, I-77 and I-381. Overall corridor traffic averages 48,000 vehicles per day (vpd), with almost 67,000 vpd near Roanoke. Originally, I-81 was designed for 15% truck traffic. Data shows the roadway currently carries an average of 18% trucks, and up to 33% on some sections.³ In Virginia, I-81 traverses rolling and mountainous topography. The up-and-

² Id.

³ VDOT's Traffic Engineering Division and Transportation & Mobility Planning Division Databases

down terrain complicates traffic flow. Maintaining consistent speeds is challenging due to the topography and the high volume of heavy vehicles such as trucks, RVs and horse trailers. People using I-81 in Virginia include commercial drivers, commuters, tourists, through travelers, and many college students. Twenty-nine colleges and universities are located along the I-81 corridor.

Process for Developing Project List(s)

VDOT's Bristol, Salem, and Staunton District offices developed a candidate project list in April 2015 examining the I-81 corridor. The list initially contained 105 recommendations totaling approximately \$6 billion which was later refined, utilizing the various factors described herein, resulting in a list of 41 smaller break-out projects totaling approximately \$1.5 billion. The I-81 corridor was analyzed using available performance data for capacity, safety, bridge and pavement deficiencies. The analysis processes and performance measures for each of the categories are outlined below.

Bridge

For purposes of this report, the Bridge category only considers mainline bridges, while other bridge improvement recommendations (interchange overpasses/underpasses) are included in the capacity category where interchanges are impacted. A total of eight bridge projects (**15 separate bridge structures**) are being recommended as the top structures warranting further consideration in the corridor, based on their deck ratings, superstructure ratings, substructure ratings and their structurally deficient/functionally obsolete status. Some of the bridge structures are already included in the Six-Year Improvement program and are partially funded as indicated in Appendix B.

Capacity

Potential capacity improvements were classified into two categories: Interchange Modification and Mainline Widening. Different metrics were used to prioritize the interchange modification and mainline widening projects resulting in two subcategories for capacity recommendations

The Capacity – Interchange Modification subcategory was scored with points being assigned to metrics based on:

- population density within a three mile radius of the interchange,
- traffic volume to capacity ratios,
- bridge sufficiency rating,

- bridge structurally deficient or functionally obsolete,
- designated technology zones,
- designated business incubator sites,
- designated enterprise zones,
- future year (2040) traffic volumes on I-81 and intersecting route, and
- major freight generating facilities adjacent to the interchange.

The Capacity – Widening category was scored on the average traffic density of the section under consideration.

Pavement

The Pavement Category used a measure to prioritize pavement conditions requiring a reconstruction effort. A Modified Structural Index (MSI) index number < 1 represents a section with an inadequate pavement structure. A total of ten projects were recommended for pavement reconstruction.

Safety

The Safety category was based on an evaluation of existing safety conditions of the area or facility to be improved by using the average of the ranking for Fatal + Injury Accidents and the ranking for Fatal+Injury Accidents/100 million Vehicle Miles Traveled. A total of ten projects were recommended for safety improvements.

Safety / ITS

A list of operational type ITS improvements were also included for each district. These projects will serve to fill gaps in the current ITS infrastructure along the entire I-81 corridor. ITS improvements should also be considered as an element of any other proposed I-81 improvements listed in other categories.

Findings

A total of forty-one projects were identified along the 325 miles of Interstate 81 in Virginia for inclusion in the list of candidate projects to be considered for the Six Year Program to be adopted by the CTB in June 2016. Many of the projects can be broken into smaller projects of independent utility or are a subset of a larger mainline widening or interchange projects. Although the candidate project list contains projects that may not qualify for HB2 funding, other sources of funding maybe available such as:

- State of Good Repair
- Open Container Safety Funds

- Revenue Sharing
- Asset Management
- Regional Revenues
- CMAQ Federal Funds
- Highway Safety Federal Funds
- Transportation Alternative Funding

VDOT maintains a list of Statewide Transportation Planning recommendations and that list will be updated with the projects in this report as appropriate.

A summary of the total number of projects being recommended as candidate projects in each category and associated cost ranges is included in the table below:

Category	Total No. Projects (I-81 Corridor)	Total Cost Range (Corridor)(Millions)(Rounded)	
		<i>Low</i>	<i>High</i>
Bridge	8	173	254
Capacity – Widening	5	380	581
Capacity - Interchange Modification	5	187	286
Pavement	10	222	342
Safety	10	197	302
Safety / ITS	3	7	11
TOTALS		1,166	1,776

The complete candidate projects list by project type is provided in Appendix B.

VDOT solicited input from local elected officials, state legislators, and other affected stakeholders through a series of meetings that were held along the corridor. The corridor wide meeting that was held at VMI gave the attendees an overview of HB2 and an overview of deficiencies along the I-81 corridor. Additional meetings that were held in each of the districts provided a more in depth dialogue on the identified deficiencies in that specific district. Attendance at the corridor wide and regional meetings was as outlined in the table below.

Date / Region	Location	Attendees
June 30, 2015 Corridor Wide meeting— Hosted by the Secretary of Transportation	Virginia Military Institute (VMI), Lexington, VA	Members of VA General Assembly, Secretary of Transportation , CTB Members, MPOs, PDCs, Local Officials, VDOT Staff
August 10, 2015 Staunton District meeting	Blue Ridge Community College, Weyers Cave, VA	Members of VA General Assembly, CTB Members, MPOs, PDCs, Local Officials, VDOT Staff
August 27, 2015 Salem District meeting	VDOT Salem District Auditorium, Salem, VA	Members of VA General Assembly, CTB Members, MPOs, PDCs, Local Officials, VDOT Staff
September 10, 2015 Bristol District meeting	Heartwood, Abingdon, Virginia	Members of VA General Assembly, CTB Members, MPOs, PDCs, Local Officials, VDOT Staff

Appendix A- Budget Amendment Item 427 L

Secretary of Transportation (186)

Item 427.

Authority: Title 2.2, Chapter 2, Article 10, §2.2-201, and Titles 33, 46, and 58, Code of Virginia.

L. 1. The Commonwealth Transportation Board shall direct the staff of the Virginia Department of Transportation's Bristol, Salem and Staunton districts to develop a list of potential improvements to address congestion and safety concerns along the Interstate 81 corridor as a part of the statewide prioritization process enacted by the 2014 General Assembly pursuant to § 33.1-23.5:5, Code of Virginia.

2. In the identification of potential candidate projects for evaluation, the Board shall solicit input from local elected officials, state legislators, and other affected stakeholders. Further, the Board shall give priority to projects that minimize the impacts on adjacent communities, including historic battlefields, and to projects that can be implemented within the existing right-of-way or with minimal additional right-of-way. An interim report, including a listing of the identified projects and estimated costs shall be completed by November 1, 2014. By January 1, 2016, a final listing, developed pursuant to the provisions of House Bill 2, 2014 Session of the General Assembly, will list the prioritized candidate projects identified for potential inclusion in the Six Year Program adopted by the Commonwealth Transportation Board in June 2016.

Appendix B -Item 427 Candidate Project List

Project Type	District	UPC	Detailed Description	Candidate or in SYP	Start MP	End MP	Length (miles)	Direction	Estimate (Low) \$Millions	Estimate (High) \$Millions	Jurisdiction
Capacity / Widening	Bristol	To Be Determined	Interstate Mainline Widening between MP 8.0 and MP 11.3. Includes Exit 10 Modifications	Candidate	8	11.3	3.3	N&S	99.535	152.23	Washington
Capacity / Widening	Bristol	To Be Determined	Add an auxiliary lane to NB I-77/SB I-81 at Exit 81 to alleviate peak hour queues and driver confusion	Candidate	80.1	81.1	1	SB	8.585	13.13	Wythe
Capacity / Widening	Salem	To Be Determined	Widen from four (4) to six (6) lanes; bridge replacement over I-81 at Exit 141; includes Masons Creek bridges (already widened to handle six-lanes)	Candidate	140.4	143.6	3.2	N&S	110	169	Roanoke

Project Type	District	UPC	Detailed Description	Candidate or in SYP	Start MP	End MP	Length (miles)	Direction	Estimate (Low) \$Millions	Estimate (High) \$Millions	Jurisdiction
Capacity / Widening	Salem	To Be Determined	Widen from 4 to 6 lanes; northbound mainline bridge replacement at Exit 143 over I-581 ramps, mainline bridge replacements over Route 1836 (Belle Haven Road); bridge replacement over I-81 at Exit 146; mainline bridge replacements over Route 648 (Reservoir Road)	Candidate	143.6	147.6	4	N&S	94	143	Roanoke / Botetourt
Capacity / Widening	Salem	To Be Determined	Widen from 4 to 6 lanes; Weigh Station at mile point 148.9; mainline bridge replacements over Tinker Creek; northbound bridge replacement at Exit 150	Candidate	147.6	150.5	2.9	N&S	68	104	Botetourt

Project Type	District	UPC	Detailed Description	Candidate or in SYP	Start MP	End MP	Length (miles)	Direction	Estimate (Low) \$Millions	Estimate (High) \$Millions	Jurisdiction
Capacity / Interchange	Bristol	To Be Determined	Relocate Frontage Roads and modify ramps to improve safety at I-81 Exit 19 in Abingdon.	Candidate	19.6			N&S	71.4	109.2	Washington
Capacity / Interchange	Salem	To Be Determined	Improve interchange at Exit 114; includes replacement of northbound and southbound bridges over Route 8, including approaches; and improvements to Route 8	Candidate	114.4			N&S	45.05	68.9	Montgomery
Capacity / Interchange	Staunton	To Be Determined / 104177	Replace Rte 33 bridges (structures # 20441 & 20443, brige priorities 1 & 2) over I-81 and approaches. 1 of 2 bridges in Primary SYP, UPC 104077, 0033-082-805,P101,R201,C501,B624 partially funded, PE only	Both	247			over	27.2	41.6	City of Harrisonburg

Project Type	District	UPC	Detailed Description	Candidate or in SYP	Start MP	End MP	Length (miles)	Direction	Estimate (Low) \$Millions	Estimate (High) \$Millions	Jurisdiction
Capacity / Interchange	Staunton	To Be Determined / 100781	Replace Rte. 33 bridges (structures # 20446 & 20447, bridge priorities 3 & 4) over NSRR & creek, construct approaches, & tie-ins to I-81 SBL off-ramp and SBL on-ramp.1 of 2 bridges in Primary SYP, UPC 100781, 0033-082-765,P101,B623 partially funded.	Both	247			off ML	17	26	City of Harrisonburg
Capacity / Interchange	Staunton	To Be Determined / 104020	Replace Rte. 50/17 Bridge (structure # 8055, bridge priority 5) over I-81 and build approaches. Bridge only portion in primary SYP, UPC 104020, 0017-034-830, P101, R201, M501, B627 PE only	Both	313			over	26.35	40.3	City of Winchester

Project Type	District	UPC	Detailed Description	Candidate or in SYP	Start MP	End MP	Length	Direction	Estimate (Low) \$Millions	Estimate (High) \$Millions	Jurisdiction
Safety	Bristol	To Be Determined	Relocate Frontage Roads and modify ramps to improve safety at I-81 Exit 17 in Abingdon.	Candidate	15.68	18.26	1.5	NB	17	26	Town of Abingdon
Safety	Bristol	To Be Determined	Project will extend the SB I-77/NB I-81 acceleration to improve weave and will install an overhead sign to reduce driver confusion.	Candidate	76.5	76.6	0.15	NB	1.275	1.95	Town of Wytheville
Safety	Salem	To Be Determined	Extend southbound deceleration lane at Exit 114	Candidate	114.5		0.2	SB	1.105	1.69	Montgomery
Safety	Salem	To Be Determined	Construct northbound truck climbing / acceleration lane from Ironto rest area	Candidate	129.4	131.3	1.9	NB	29.75	45.5	Montgomery
Safety	Salem	To Be Determined	Extend northbound acceleration lane at Exit 137; includes bridges over Route 635 (Goodwin Avenue) and Route 619 (Wildwood Road)	Candidate	137.2			NB	1.275	1.95	Roanoke
Safety	Salem	To Be Determined	Construct northbound truck climbing lane from James River	Candidate	165.3	167.2	1.9	NB	26.35	40.3	Botetourt

Project Type	District	UPC	Detailed Description	Candidate or in SYP	Start MP	End MP	Length	Direction	Estimate (Low) \$Millions	Estimate (High) \$Millions	Jurisdiction
Safety	Salem	104130	Reconstruction and realignment to eliminate substandard geometry; includes Exits 167 interchange and bridges, and Exit 168 interchange and overhead bridge	SYP	166.5	168	1.5	N&S	107.95	165.1	Botetourt
Safety	Staunton	To Be Determined	Extend acceleration/deceleration lanes at Exit 220	Candidate	220			N&S	4.25	6.5	Augusta
Safety	Staunton	To Be Determined	Extend acceleration/deceleration lanes at Exit 222	Candidate	222			N&S	4.25	6.5	Augusta
Safety	Staunton	To Be Determined	Extend acceleration/deceleration lanes at Exit 323	Candidate	323			N&S	4.25	6.5	Frederick

Project Type	District	UPC	Detailed Description	Candidate or in SYP	Start MP	End MP	Length	Direction	Estimate (Low) \$Millions	Estimate (High) \$Millions	Jurisdiction
Safety / ITS	Bristol	To Be Determined	Various Locations - ITS improvements. VMS installation to enhance driver notification and messaging. Camera installation to enhance driver notification and messaging. Projects work to achieve desired camera spacing for corridor.	Candidate	1	86		N&S	\$1.90	\$2.90	Various
Safety / ITS	Staunton	To Be Determined	Various Locations - ITS improvements. VMS installation to enhance driver notification and messaging. Camera installation to enhance driver notification and messaging. Projects work to achieve desired camera spacing for corridor.	Candidate	174	324		N&S	\$4.30	\$6.50	Various
Safety / ITS	Salem	To Be Determined	Various Locations - ITS improvements. VMS installation to enhance driver notification and messaging. Camera installation to enhance driver notification and messaging. Projects work to achieve desired camera spacing for corridor.	Candidate	92	153		N&S	\$0.80	\$1.20	Salem District

Project Type	District	UPC	Detailed Description	Candidate or in SYP	Start MP	Direction	Estimate (Low) \$Millions	Estimate (High) \$Millions	Jurisdiction
Bridge	Bristol	To Be Determined	Replace NB and SB mainline bridges (structures #18944 & 18942) over Halls Bottom Road (Rte 808) in Washington County	Candidate	11.1	N&S	\$11	\$17	Washington
Bridge	Bristol	To Be Determined	Replace NB and SB mainline bridges (structures #18922 & 18924) over Routes 11/US58 at Exit 19 in Washington County	Candidate	19.7	N&S	\$14	\$21	Washington
Bridge	Bristol	97556 & To Be Determined	Replace NB mainline bridge (structure #18928) over Route 80 at Exit 24 in Washington County near Meadowview. Project 0081-095-956, P101, B674 in SYP, partially funded. Replace SB mainline bridge (structure #18926) over Route 80 at Exit 24 in Washington County near Meadowview.	SYP & Candidate	25.1 & 25.2	NB & SB	\$7.80	\$12.00	Washington
Bridge	Bristol	To Be Determined	Replace NB and SB mainline bridges (structures #17426 & 17427) over the Middle Fork Holston River in Smyth County.	Candidate	34.8	N&S	\$14	\$21	Smyth

Project Type	District	UPC	Detailed Description	Candidate or in SYP	Start MP	Direction	Estimate (Low) \$Millions	Estimate (High) \$Millions	Jurisdiction
Bridge	Bristol	To Be Determined	Replace NB and SB mainline bridges (structures #17470 & 17472) over Mulberry Lane (Route 686) in Smyth County	Candidate	51.4	N&S	\$11	\$17	Smyth
Bridge	Bristol	104936	Replace NB and SB mainline I-81 Bridges (Structures 19596 & 19597) over Reed Creek in Wythe Co. Project 0081-098-778, P101 is in the SYP, partially funded	SYP			\$20	\$20	Wythe
Bridge	Salem	56899	Replace northbound bridge (structure # 12161) over the New River at Exit 105	SYP	105.1	NB	\$66	\$101	Montgomery / Pulaski
Bridge	Salem	93074 / 93075	Replace northbound and southbound bridges (structures # 22513 & 22515) over Route 8 at Exit 114; includes improving approaches	SYP	114.4	N&S	\$30	\$46	Montgomery

Project Type	District	UPC	Detailed Description	Candidate or in SYP	Start MP	End MP	Length	Direction	Estimate (Low) \$Millions	Estimate (High) \$Millions	Jurisdiction
Pavement Reconstruction	Salem	To Be Determined	New River Valley area - Full depth pavement reconstruction; various locations northbound and southbound	Candidate	103.8	121.1	17.3	NB/SB	6	10	Pulaski / Montgomery
Pavement Reconstruction	Salem	To Be Determined	Roanoke Valley area - Full depth pavement reconstruction northbound; including stabilization of existing subsurface concrete slabs of interstate roadway in Botetourt County	Candidate	137.8	151.8	14	NB	11	18	Roanoke / Botetourt
Pavement Reconstruction	Salem	To Be Determined	Buchanan area - Full depth pavement reconstruction southbound	Candidate	164.2	172.2	8	SB	10	16	Botetourt
Pavement Reconstruction	Staunton	To Be Determined	Reconstruct pavement section from milepost 178.7-182.5 NB	Candidate	178.7	182.5	3.8	NB	10	16	Rockbridge
Pavement Reconstruction	Staunton	To Be Determined	Reconstruct pavement section milepost 180-202.2 SB	Candidate	180	202.2	22.2	SB	59	90	Rockbridge

Project Type	District	UPC	Detailed Description	Candidate or in SYP	Start MP	End MP	Length	Direction	Estimate (Low) \$Millions	Estimate (High) \$Millions	Jurisdiction
Pavement Reconstruction	Staunton	To Be Determined	Reconstruct pavement section milepost 186.2-191.3 NB	Candidate	186.2	191.3	5.1	NB	14	21	Rockbridge
Pavement Reconstruction	Staunton	To Be Determined	Reconstruct pavement section milepost 202-219.0 NB	Candidate	202	219	17	NB	43	66	Rockbridge & Augusta
Pavement Reconstruction	Staunton	To Be Determined	Reconstruct pavement section milepost 205.5 to 217.0 SB	Candidate	205.5	217	11.5	SB	29	45	Augusta
Pavement Reconstruction	Staunton	To Be Determined	Reconstruct pavement section milepost 237.5-243.8 NB	Candidate	237.5	243.8	6.3	NB	17	26	Rockingham
Pavement Reconstruction	Staunton	To Be Determined	Reconstruct pavement section milepost 276.2-285 NB	Candidate	276.2	285	8.8	NB	23	35	Shenandoah

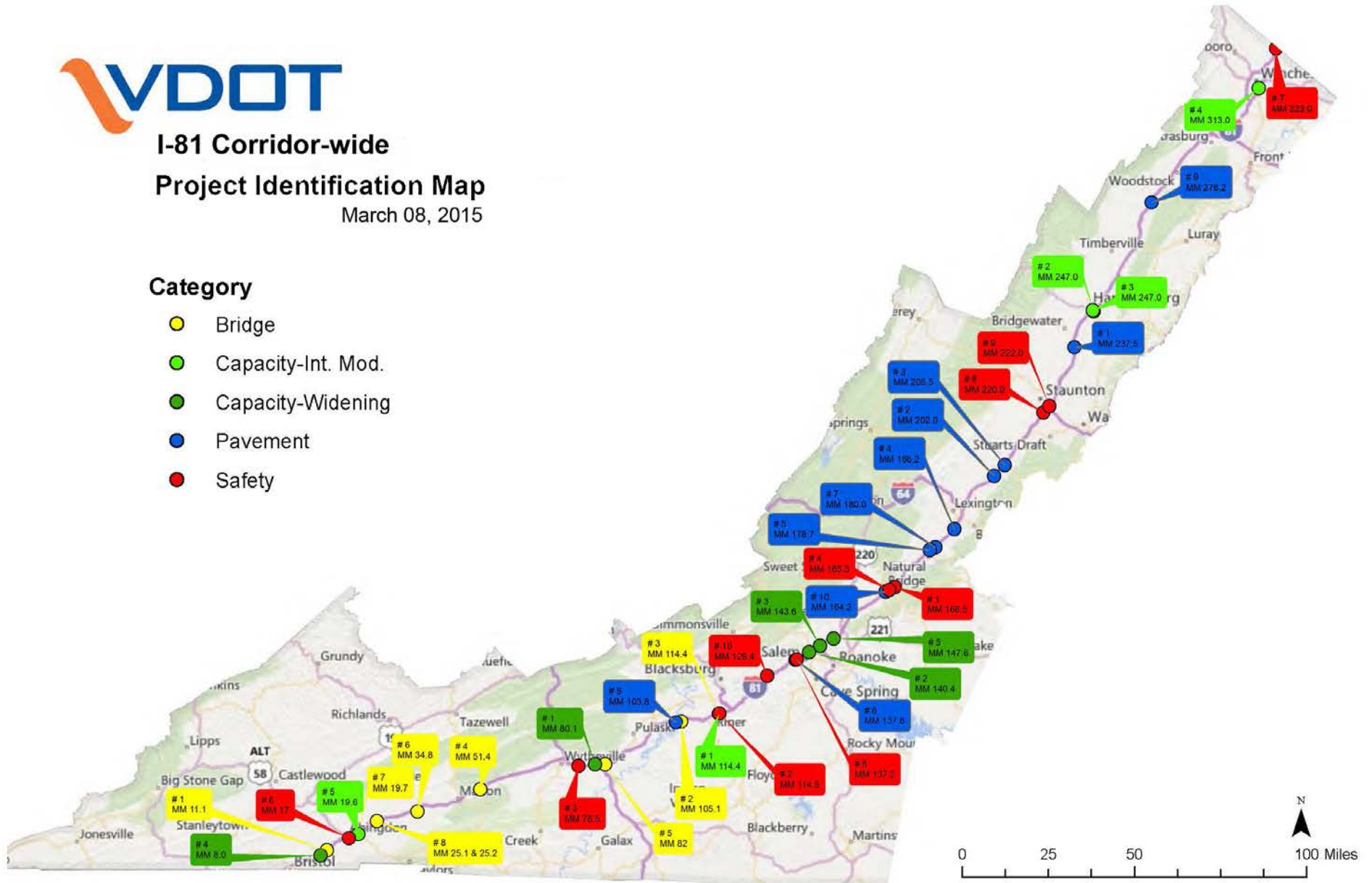


I-81 Corridor-wide Project Identification Map

March 08, 2015

Category

- Bridge
- Capacity-Int. Mod.
- Capacity-Widening
- Pavement
- Safety



Appendix C - Item 427 HB2 Projects Submitted (September 30, 2015 Deadline)

HB2 Application ID	District	Locality	Project Type	Project Cost	HB2 Project Description
337	Bristol	Washington County	Interchange Modification	\$9,735,983	I-81/Exit 19 interchange modification - reconfiguration of the Exit 19 northbound and southbound on and off ramps. It also includes the relocation and widening of a service road (Empire Drive) to accommodate the reconfigured southbound off ramp traffic. Empire Drive will also have paved shoulders to accommodate bike and pedestrian traffic. The reconfigured ramps and service road provide additional turn lanes and traffic signals to reduce the risk of off ramp queuing on I-81 and to reduce queuing on Route 11 (Lee Highway). The additional turn lanes also provide improved traffic flow into numerous businesses and retail developments located near this interchange.
166	Salem	City of Salem / Roanoke County	Auxiliary Lane / Widening	\$29,830,716	The Interstate 81 Capacity Project "A" seeks to provide an auxiliary lane and widening of inside and outside lanes of northbound 81 between Exits 141 (VA 419/Electric Road) and 143 (I-581/U.S. 220). This would be the first of a three-phased project which would ultimately provide auxiliary lane addition and widening of both northbound and southbound I-81 from Exit 141 to 143.
297	Salem	City of Salem / Roanoke County	Widening	\$72,992,643	I-81 Widening from Exit 140 to 143 - This project will add one lane Northbound and one lane Southbound on Interstate I-81 between Exits 140 and 143. Widening North of the Rte. 419 overpass will occur primarily toward the median. Widening south of the Rte. 419 overpass will transition away from the median back towards the outside (Right hand side of each lane as seen from the direction of travel) and take advantage of the existing wide bridges over Kessler Mill Rd. and the existing wide pavement in this vicinity. No modifications to the bridges will be necessary to pass under the Rt 419 bridge or to make use of the bridges over Kessler Mill Rd. Lanes will be 12' wide with 10' paved shoulders. A design exception may be required for a small reduction in shoulder width at the Route 419 overpass. There will be no modification to the lengths of the existing acceleration/deceleration lanes at Exit 141. The Southbound deceleration lane meets or exceeds current standards and the Northbound deceleration lane cannot be built without replacing the Route 419 bridge.
305	Salem	City of Salem / Roanoke County / Botetourt County	Add Interchange Lighting	\$8,410,000	Interchange Lighting at I-81 Exits 137-150. This project seeks to light interchanges along I-81 beginning at Exit 137 and continuing with exits 140, 141, 143, 146, 149 and 150. The project area is roughly 13 miles along I-81, and passes through Roanoke County, the City of Salem and Botetourt County.
306	Salem	Botetourt County	Add Auxiliary Lane	\$47,744,589	I-81 Capacity Project M.P. 147.6-150.5 - Botetourt County. An auxiliary lane will be added to northbound and southbound I-81 from M.P. 147.6 to 150.5 (from Exit 150 through the truck scales).

340	Salem	Botetourt County	Study	\$105,924,260	I-81 MM 166.7-169.4 Improvements. The purpose of this project is to identify, design and construct a feasible alignment that will eliminate known substandard roadway geometry along I-81 in the Buchanan area of Botetourt County. This area is typically known as the I-81 S-Curves and experiences a fatality rate six times the district average for interstates, and crash/injury rates twice the district average. The project is focusing on the northbound and southbound lanes of I-81 between mile markers 166.7 and 169.4 and on the interchanges located at Exit 167 and Exit 168. The alternatives studied to date will require the northbound and southbound lanes of I-81 to be realigned and the partial interchange at Exit 167 to be removed. To maintain full access to and from I-81 via Route 11, Route 11 will be extended to Arcadia Road (Exit 168) via a connection made to the southern terminus of Diamond Hill Road.
349	Salem	Botetourt County	Safety - Correct Substandard Superelevation	\$38,151,285	I-81 Safety Improvements from MM 166.5-168.5. This section of Interstate 81 from milepost 166.5 to 168.5 has multiple horizontal curves with substandard superelevation which result in an above average number of crashes. Roadway departure crashes account for 75% of the crashes within the aforementioned project limits. Additionally, the pavement is generally in poor condition caused by a variety of factors including, but not limited to, high truck traffic and poor subsurface drainage due to a lack of underdrains in the section. This project will correct the substandard superelevation through all curves within the project limits except for one which is limited by the presence of a bridge. The entire limits will be surfaced with a high friction surface treatment course including the curve without superelevation correction.
51	Staunton	City of Harrisonburg	Bridge Replacement / Interchange Improvements	\$51,594,574	I-81 Exit 247 Improvements - The scope of this project is to replace deteriorated bridge structures over I-81 and Norfolk Southern Railroad (NSRR) and make improvements to the interchange as recommended in the Interchange Alternatives Analysis recently completed by the HRMPO. See below for a detailed description of the improvements to be made: - Replace WBL Bridge over I-81 (Fed ID 20441, VA Str 1082) with new 4 lane bridge. Current Sufficiency Rating 62.8; - Replace EBL Bridge over I-81 (Fed ID 20443, VA Str 1083) with new 4 lane bridge. Current Sufficiency Rating 49.2; - Reconstruct mainline bridge approaches; - Remove EB Rt 33 to NB I-81 Loop on Ramp; - Construction LTL and Ramp connection from EB Rt 33 to other NB I-81 On-Ramp; - Extend by 276' the NB I-81 to WB Rt 33 deceleration lane; - Extend by 397' the SB I-81 to EB Rt 33 deceleration lane; - Construct WB Rt 33 LTL; - Reconstruct merge lanes from off ramps around bridges; - Minor reconstruction of all ramp tie-in points along Rt 33; - Construct new sidewalk from Burgess Rd / Linda Ln intersection across the interchange and will terminate at MLK Jr. Way; - Replace WBL Bridge of NSRR (Fed ID 20446, VA Str 1900) with new 3 lane bridge. Current Sufficiency Rating 46.1; - Replace EBL Bridge of NSRR (Fed ID 20447, VA Str 190) with new 3 lane bridge. Current Sufficiency Rating 62.2; - Minor reconstruction of mainline bridge approaches; - Widen Rt 33 to 3 lanes beginning at the interchange. EB widening to extend to MLK Jr. Way and WB widening to S. Carlton St;
135	Staunton	City of Staunton / Augusta County	Acceleration / Deceleration Lane Extension	\$5,612,938	I-81 Exit 220 and 221 Acceleration/Deceleration Lanes. Extend acceleration and deceleration lanes at Exits 220 and 221 to improve safety and bring geometric design to current AASHTO standards.

137	Staunton	City of Staunton / Augusta County		\$2,045,900	I-81 Exit 222 Improvements. This project, located at Interstate 81 Exit 222 (U.S. Route 250), will extend the northbound acceleration lane from an existing 850 feet with a 400-foot taper to a proposed 1200 feet with a 300-foot taper and extend the southbound deceleration lane from 430 feet with a 320-foot taper to 800 feet with a 300-foot taper. The project also will require fill, drainage, and guardrail adjustments. The purpose of the project is to enhance safety by improving weave conditions.
200	Staunton	Frederick County	Acceleration / Deceleration Lane Extension	\$3,450,904	I-81 Exit 323 Acceleration/Deceleration Lane Extension -This project proposes to extend the southbound acceleration and northbound deceleration lanes at I-81 Exit 323 (Whitehall -- Route 669) to conform with 2011 AASHTO Guidelines. Specifically, the southbound acceleration lane will be extended from its current 250' (plus 430' taper) to 1,200' (plus 300' taper); and the northbound deceleration lane will be extended from its current 250' (plus 300' taper) to 800' (plus 300' taper).
216	Staunton	City of Harrisonburg	Interchange Modification	\$43,920,000	The I-81 Exit 245 realignment will involve the following improvements: - Relocation of the I-81 NB off ramp to align with Forest Hill Road; - Connect the newly aligned ramp to existing deceleration lane on I-81, thus no extension of the deceleration lanes is proposed; - 1-16' lane will be connected to existing deceleration lane, which will expand to 3-13' lanes at the intersection of Port Republic Road. - Provide 300' of storage within the 3 lane section; - Provide a 4' paved shoulder on the left, and 8' paved shoulder on the right; - Designed with a 50 mph design speed, in rolling terrain, and to the GS-R standard; - Only modifications to the existing signals on Port Republic Road will be required; - James Madison University has stated their willingness to provide all required right of way from property that they own. Also, with this project the access to an existing JMU parking lot and a private Service Station will be impacted and as such this project will include the construction of an access road to both of the properties from an adjacent street.
264	Bristol	Town of Abington	I-81 at State Route 75 (Exit 17) Interchange Modifications	\$21,200,000	Existing three lane Rt 75 under the I81 Exit 17 bridges is inadequate, with left turning vehicles exceeding storage capacity and blocking thru lanes, causing significant queuing on the I81 off ramps to the interstate mainline, as well as backup on both directions of Rt 75, creating safety and access issues. This project uses common sense engineering to improve operations and safety at Exit 17 at a fraction of the cost of the total interchange reconfiguration in UPC 17745. NB on and off ramps will be reconfigured. The NB on ramp will be a free flow right turn loop, eliminating competing on ramp left turns under the interstate bridges. I81 NB bridge over Rt 75 will be widened, creating a longer acceleration lane. The NB off-ramp will be lengthened, increasing queue storage that is at times inadequate. Signalized intersection for the NB ramps will be relocated 350 feet to the south, increasing the separation with the SB ramp signalized intersection from 320 feet to 670 feet. A new Park and Ride Lot will be constructed off of Country Club Dr. Improved efficiency at interchange will provide better access to a major proposed commercial and recreational development 0.3 miles from project location. New sidewalk will be constructed on west side of Rt 75 from ramps to south end of improvements. Widened lanes on Rt 75 and paved shoulders on Country Club Drive and Gravel Lake Rd will provide pedestrian and bike accommodation. West end of Country Club Dr will be realigned, and Commerce Dr will be rerouted to a new Service Road and Gravel Lake Rd, improving overall access management in the project area. Realignment of Gravel Lake Road provides access for existing businesses and

					undeveloped parcels, promoting economic and infill development, to a new signalized intersection with Rt 75 and Fairway Dr. Existing intersection of Vances Mill Rd Rt 75 will be relocated 600 feet to the south.
415	Salem	Montgomery County	I-81/Route 8 (Exit 114) Interchange Reconstruction	\$51,326,837	<p>Project will provide reconfiguration of the I-81/Rte. 8 (Exit 114) traditional diamond interchange to a diverging diamond interchange (DDI). The single lane I-81 exit ramps and NB on-ramp will be upgraded to dual lane ramps. The two existing, structurally deficient I-81 bridges over Route 8 will be replaced with wider structures that improve vertical clearance and facilitate future I-81 widening. Work along I-81 will involve minor realigning and grade changes of the bridge approaches with no added lanes. Sound barrier walls are proposed at impacted areas along I-81 to reduce noise effects. Retaining walls and use of an updated diamond configuration will minimize RW impacts.</p> <p>Improvements to Route 8 would include new curb and gutter and a 10-foot shared-use path on the north side. The lane configurations along Rte. 8 will generally remain the same other than an extra lane between ramps to facilitate turning movements. These improvements would provide bicycle and pedestrian accommodations through the I-81/Route 8 interchange area and would provide connectivity to the Route 8 paved shoulders. A new park and ride is proposed in the NE quadrant of the interchange to provide approximately 74 parking spaces. A left turn lane is to be added on Rte. 8 at Life Drive. Flanagan Drive intersection will need to be shifted further from the interchange.</p>