



COMMONWEALTH of VIRGINIA
Office of the
SECRETARY of TRANSPORTATION

I-81 Corridor Improvement Plan

August 2018
Public Meetings



Virginia Department of Rail and Public Transportation



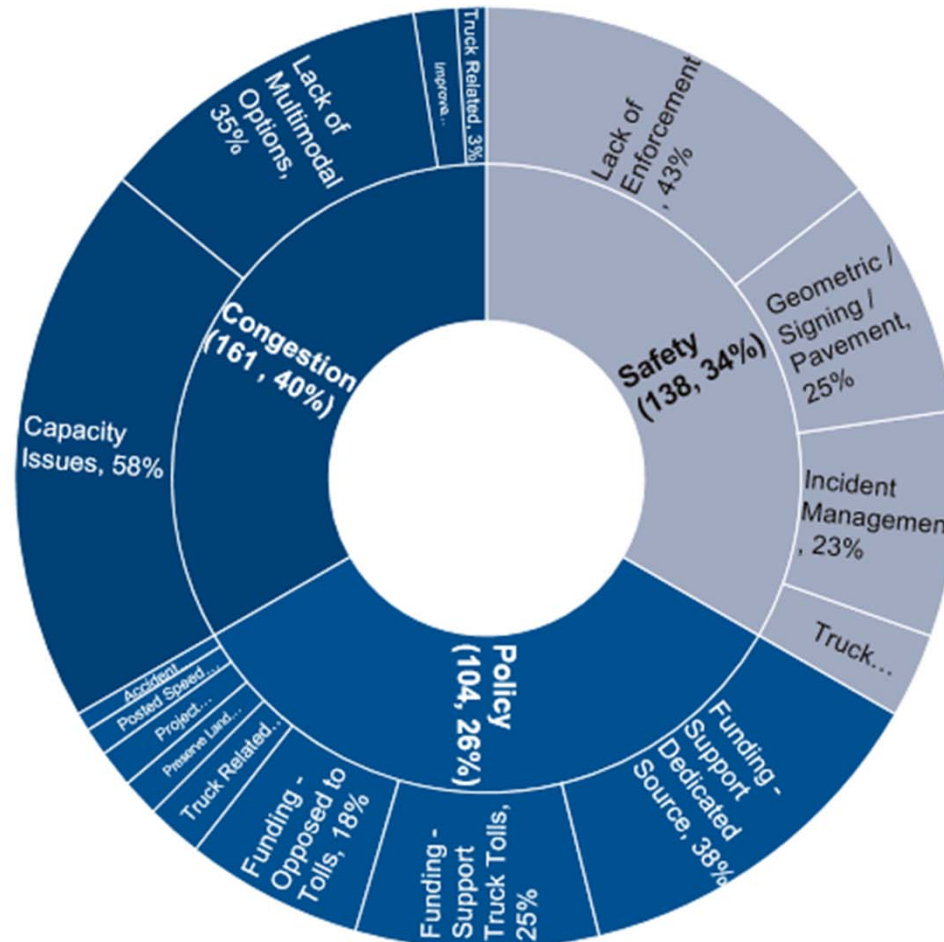
I-81 Corridor Improvement Plan

- **Overview of I-81 Corridor Improvement Plan purpose**
- **Summary of data and public feedback**
- **Overview of draft operations plan**
- **Overview of potential capital solutions**
- **Overview of potential funding options**
- **Next steps**
- **Staying involved – how to provide feedback**

I-81 Public Involvement Summary

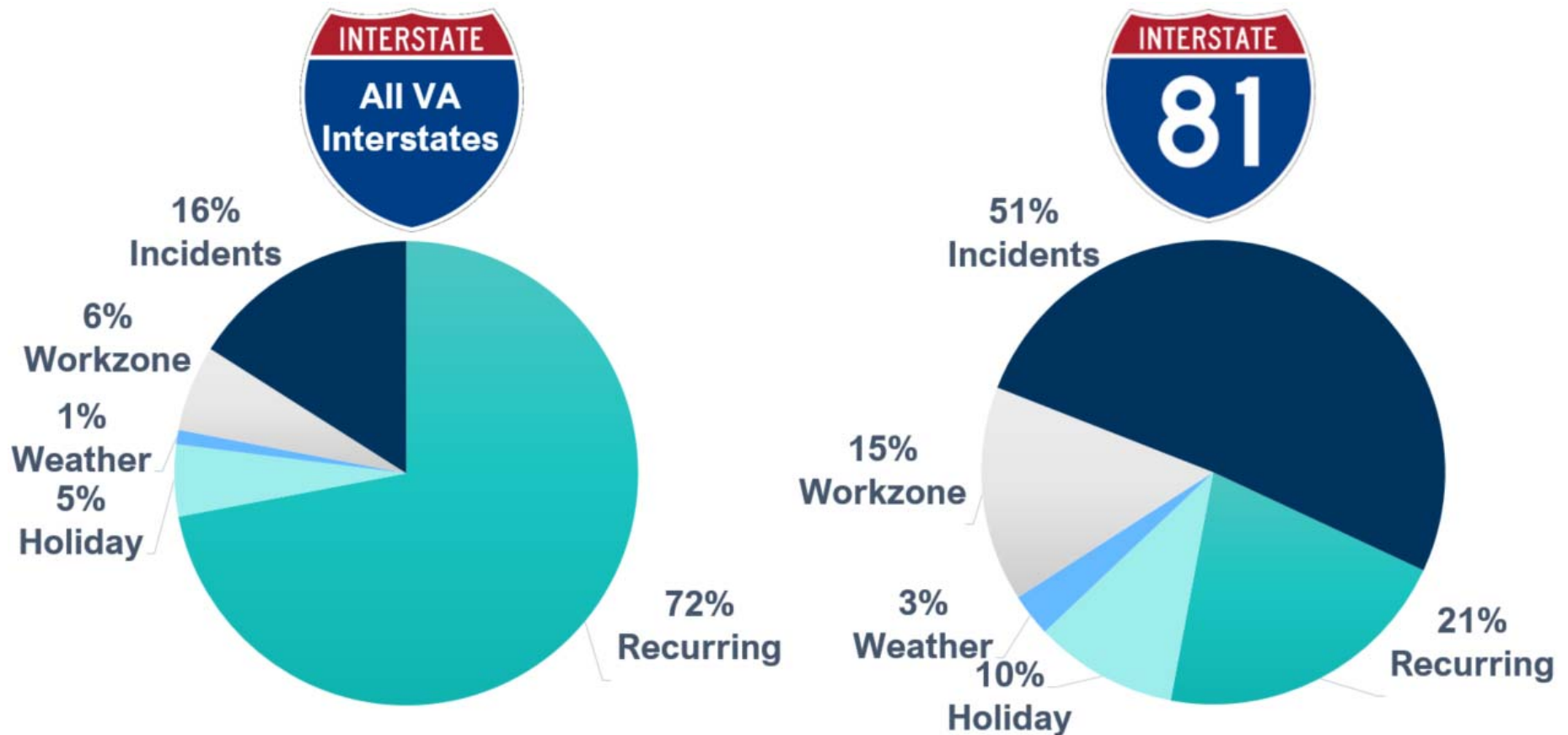
- Congestion (161, 40%)
- Policy (104, 26%)
- Safety (138, 34%)

- **Comment forms, email, and phone: 403**
- **June meeting attendance: 399**
- **Public meeting map display comments: 680**



I-81 Corridor Operations Plan

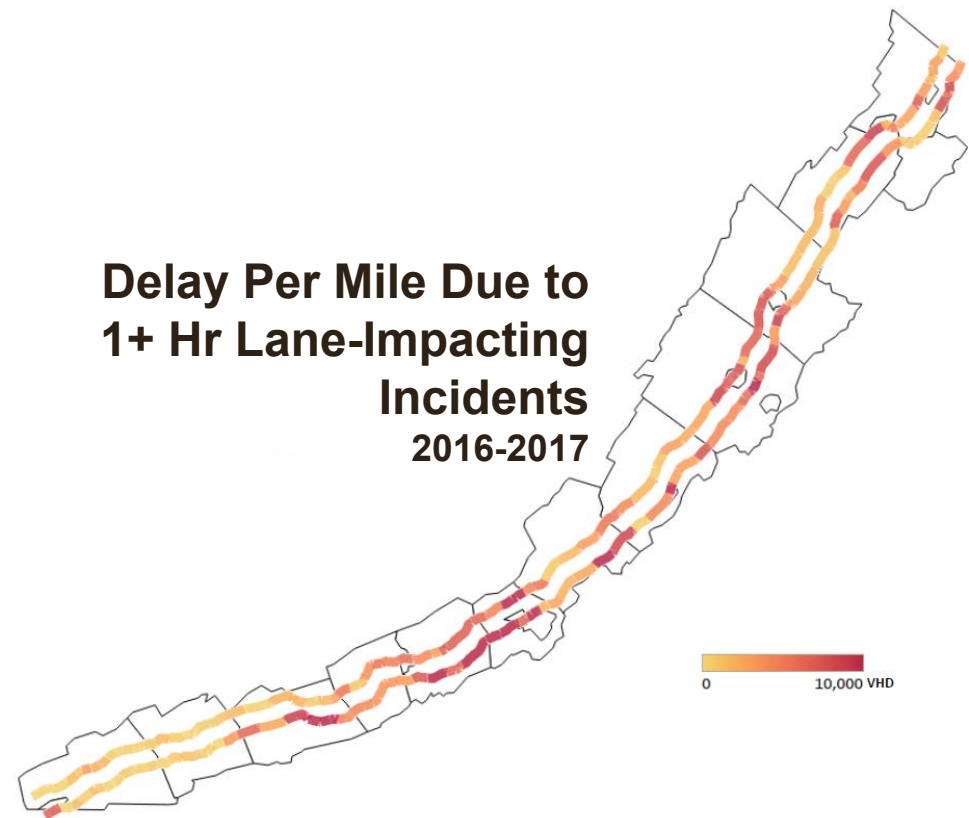
Delay Makes I-81 Unique



Potential Solutions Development

Operations and Incident Management Improvements

- Focused on corridor segments with the highest incident-related delay
- Identified crash hotspots
- Developed corridor-wide operations and incident management upgrade plan



Draft I-81 Corridor Operations Plan

I-81 Corridor Operations Plan

Key components include—

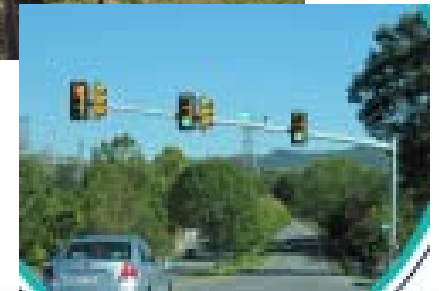
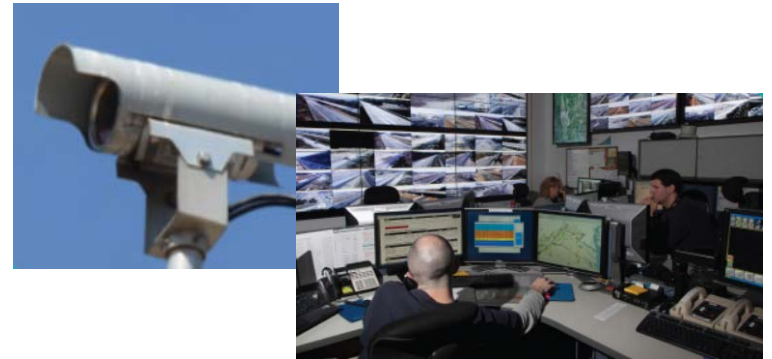
- **Changeable message signs and cameras**
- **Expanded safety service patrols**
- **Detour routes and improvements to parallel facilities**
- **Contract emergency clearance**
- **Truck parking enhancements**

Operations Improvements

Cameras and Changeable Message Signs (CMS)

- **Cameras (*eyes on the road*)**
 - Detect incidents faster
- **CMS (*communicate with you*)**
 - Inform motorists in real-time
 - Provide information in advance of major incidents
 - Alternative route, travel time

Detecting incidents, communicating information in real-time, allowing you to make informed decisions— a coordinated approach that keeps you moving



Operations Improvements

Safety Service Patrols (SSP)

- Safety vehicles that cover the interstate with services to stranded motorists
- Benefits
 - *Actively seeking events*
 - *Often first to arrive*
 - *Can move fender benders from travel lane*
 - *Call appropriate resources and start on-site traffic control*



Potential Improvements Development

Operations Improvements: Parallel Facilities

- **Why is upgrading parallel facilities important for I-81?**
 - Keeps you moving when there is an incident
 - Provides you with an alternative route
 - Helps you get around the incident
 - Helps you avoid back-ups
- **Includes:**
 - Incident management plans
 - Traffic signal operations and communications
 - Changeable message signs (CMS)
 - Geometric improvements
 - Bridge improvements
 - Signs and pavement marking



Example Incident Management Plan

Operations Improvements: Parallel Facilities

Sample detour plan for incident between Exit 222 and Exit 225



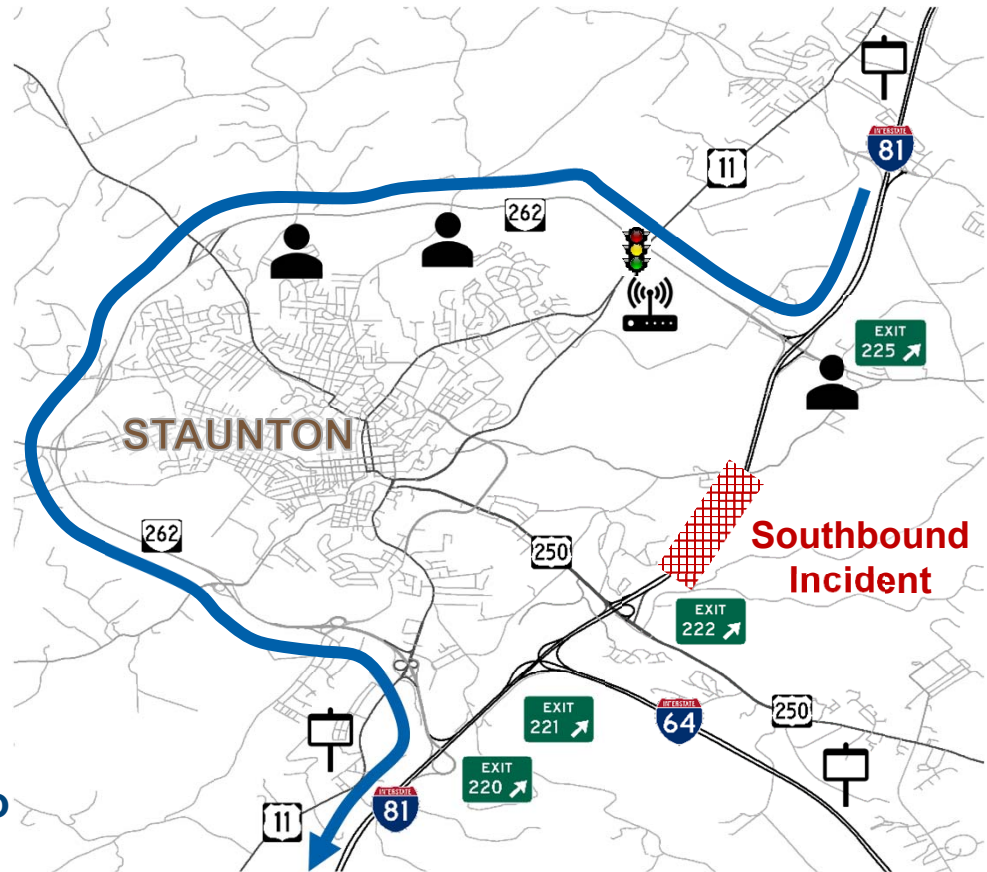
Message Signs
Inform the public of a change in traffic patterns during an incident



Traffic Control Personnel
Provide manual control of intersections during an incident



Traffic Signal Operations
Provides remote capabilities to the traffic signal to adapt to incident traffic patterns



Example Incident Management Scenario

Operations Improvements: Parallel Facilities

- Multi-hour full closure
- Detour route: US Route 262 (1 traffic signal)

- Improvements

- New cameras
- New message signs
- Communications
- Traffic signal upgrades

Scenario	I-81 Queue Length (mi)	I-81 Travel Time (min)	Route 262 Travel Time (min)
No incident			15
Incident with no Improvements	17.1	186	28
Incident with Improvements	9.2	141	19

Operations Improvements

Contract Emergency Clearance

- Dedicated response time
- Dedicated clearance services with proper equipment
- Safely moves large vehicles out of travel lane
- Reduces incident duration for complicated events
- Gets traffic moving again



With this program in place, a four-hour incident could be reduced to three hours

Operations Improvements

Truck Parking Solutions

- Strategic locations for truck parking
- Real-time truck parking information
- Reduce impacts of trucks parking on shoulders and ramps
- Benefits
 - Provides safe spaces for truck parking
 - Enhances corridor safety for all users
 - Assists truckers with complying with hours of service regulations

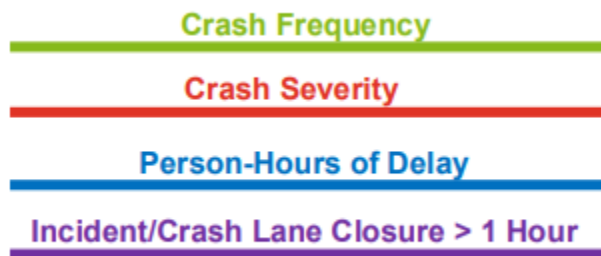


63% of truck drivers spend over 15 minutes looking for parking between 4PM and midnight; many stop driving nearly an hour early to secure a safe spot to park

Potential Capital Solutions

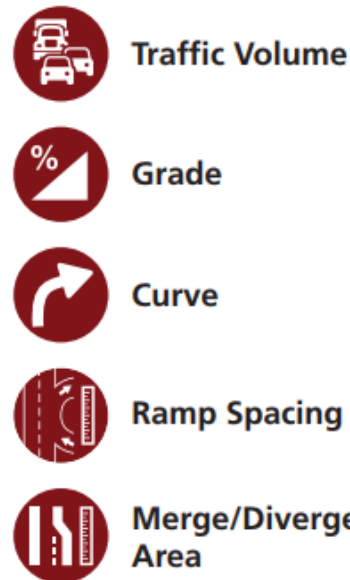
Potential Capital Solutions

- Reviewed each problem area identified by performance measures



- Determined contributing factors

Contributing Factors



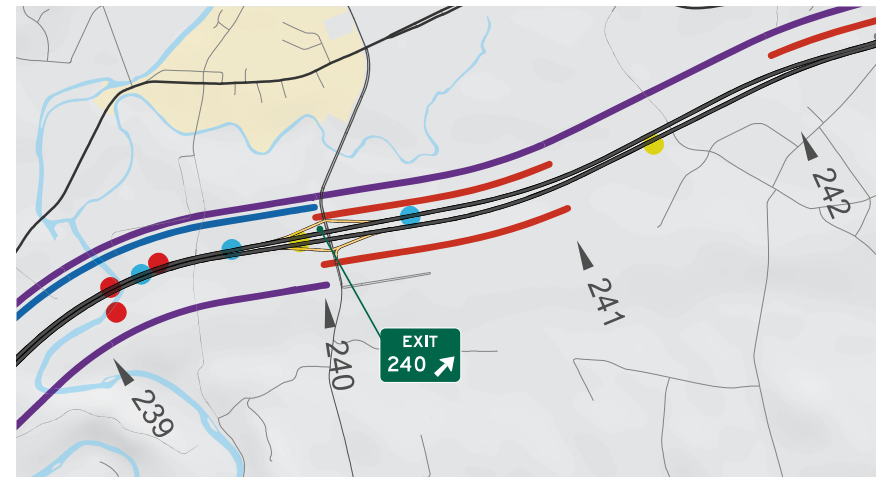
- Developed potential solutions based identified contributing factors

Potential Capital Solutions - Note

- *Some of the top problem areas cannot be addressed with infrastructure solutions*
- **Over 850 fatal and severe injury crashes between 2012-2016 reviewed on the I-81 corridor**

**Example:
MM 240 - Southbound**

- 1. Drunk driver**
- 2. Deer hit**
- 3. Insufficient tire tread**



3 Severe Injuries

Potential Solutions Development

Capital Improvements: Mainline I-81

- **Types of Solutions**

- **Widening**

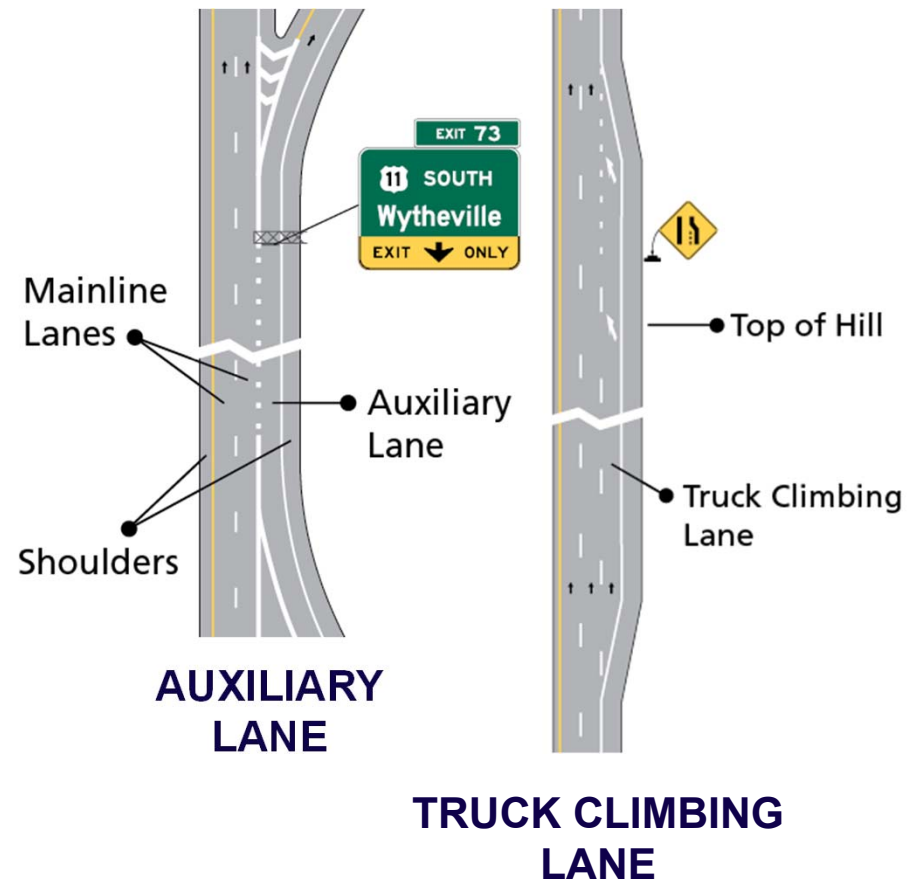
- Third through lane
- Auxiliary lane
- Truck climbing lane

- **Acceleration and deceleration lane extensions**

- **Curve improvements**

- **Interchange improvements**

- Ramp modifications
- Ramp intersection improvements



Potential Solutions Development

I-81 – Mile Marker 175-195: Potential Solutions

POTENTIAL SOLUTIONS			Targeted Issues					Contributing Factors					Goal Met	
Location	#	Potential Solutions	High Crash Frequency	High Crash Severity	Excessive Delay	Lane Closures >1 Hour	Traffic Volume	Grade	Curve	Ramp Spacing	Merge/Diverge Area	Reduce Crash Frequency	Reduce Crash Severity	Reduce Delay
NORTHBOUND														
MM 172 - 176	1	Curve improvements (Continues in Botetourt County)	✓	✓				✓			✓	✓		
EXIT 188	2	Extend acceleration and deceleration lanes	✓	✓			✓			✓	✓	✓		
EXIT 188-195	3	Widen to three lanes	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	
SOUTHBOUND														
MM 176 - 172	4	Curve improvements (Continues in Botetourt County)	✓	✓				✓			✓	✓		

Potential Solutions Development

I-81 – Mile Marker 195-216: Funded Projects

FUNDED PROJECTS		
Location	#	Funded
EXIT 205	1	Interchange improvements (2024)
EXIT 213	2	Extend northbound and southbound acceleration lanes (2017)

Potential Solutions Development

I-81 – Mile Marker 195-216: Potential Solutions

POTENTIAL SOLUTIONS			Targeted Issues					Contributing Factors					Goal Met	
Location	#	Potential Solutions	High Crash Frequency	High Crash Severity	Excessive Delay	Lane Closures >1 Hour	Traffic Volume	Grade	Curve	Ramp Spacing	Merge/Diverge Area	Reduce Crash Frequency	Reduce Crash Severity	Reduce Delay
NORTHBOUND														
EXIT 200 - 205	3	Shoulder widening	✓	✓	✓	✓		✓				✓	✓	✓
EXIT 205	4	Extend acceleration and deceleration lanes	✓	✓	✓	✓		✓		✓		✓	✓	✓
SOUTHBOUND														
EXIT 205	5	Extend acceleration lane		✓				✓		✓			✓	
EXIT 205 - 200	6	Shoulder widening		✓				✓					✓	
EXIT 200	7	Extend deceleration lane	✓					✓		✓	✓	✓		
EXIT 200 - MM 199	8	Add auxiliary lane between Exit 200 and Fairfield Safety Rest Area	✓					✓	✓	✓	✓	✓		
MM 200 - 195	9	Widen to three lanes	✓	✓				✓	✓			✓	✓	

Potential Solutions Development

I-81 – Mile Marker 216-237: Funded Projects

FUNDED PROJECTS		
Location	#	Funded
EXIT 220	1	Extend northbound and southbound acceleration and deceleration lanes (2020)
EXIT 221	2	Extend southbound acceleration lane (2020)
EXIT 222	3	Extend northbound acceleration lane and southbound deceleration lane (2020)
EXIT 235	4	Access improvements at interchange – eastbound and westbound right-turn lanes (2022)

Potential Solutions Development

I-81 – Mile Marker 216-237: Potential Solutions

POTENTIAL SOLUTIONS			Targeted Issues					Contributing Factors					Goal Met	
Location	#	Potential Solutions	High Crash Frequency	High Crash Severity	Excessive Delay	Lane Closures >1 Hour	Traffic Volume	Grade	Curve	Ramp Spacing	Merge/Diverge Area	Reduce Crash Frequency	Reduce Crash Severity	Reduce Delay
NORTHBOUND														
EXIT 222 - 225	5	Widen to three lanes	✓	✓		✓	✓			✓		✓	✓	✓
MM 232	6	Extend acceleration lane at Mt. Sidney Safety Rest Area				✓		✓		✓				✓
MM 234 - 237	7	Add truck climbing lane (continued on board 4)				✓		✓		✓				✓
SOUTHBOUND														
MM 237 - 235	8	Add truck climbing lane		✓	✓	✓		✓		✓		✓	✓	✓
MM 232	9	Extend acceleration and deceleration lanes at Mt. Sidney Safety Rest Area		✓	✓	✓		✓		✓		✓	✓	✓
EXIT 225	10	Extend acceleration lane		✓	✓	✓	✓			✓		✓	✓	✓
EXITS 225 - 217	11	Widen to three lanes	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓
EXITS 221 - 220	12	Add auxiliary lane between Exit 221 and Exit 220	✓	✓	✓		✓			✓	✓	✓	✓	✓

Potential Solutions Development

I-81 – Mile Marker 237-258: Funded Projects

FUNDED PROJECTS		
Location	#	Funded
EXIT 245	1	Realign northbound off-ramp to tie into Forest Hill Road (2020)
EXIT 247	2	Remove northbound on-ramp loop to eliminate northbound weave on I-81 (2024)

Potential Solutions Development

I-81 – Mile Marker 237-258: Potential Solutions

POTENTIAL SOLUTIONS			Targeted Issues					Contributing Factors				Goal Met		
Location	#	Potential Solutions	High Crash Frequency	High Crash Severity	Excessive Delay	Lane Closures >1 Hour	Traffic Volume	Grade	Curve	Ramp Spacing	Merge/Diverge Area	Reduce Crash Frequency	Reduce Crash Severity	Reduce Delay
NORTHBOUND														
MM 234 - 237	3	Add truck climbing lane (continued from board 3)			✓		✓			✓			✓	
MM 243 - 248	4	Widen to three lanes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SOUTHBOUND														
MM 248 - 243	5	Widen to three lanes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Potential Solutions Development

I-81 – Mile Marker 258-278: Potential Solutions

POTENTIAL SOLUTIONS			Targeted Issues					Contributing Factors				Goal Met		
Location	#	Potential Solutions	High Crash Frequency	High Crash Severity	Excessive Delay	Lane Closures >1 Hour	Traffic Volume	Grade	Curve	Ramp Spacing	Merge/Diverge Area	Reduce Crash Frequency	Reduce Crash Severity	Reduce Delay
NORTHBOUND														
EXIT 269	1	Extend deceleration lane	✓	✓			✓	✓		✓	✓	✓		
SOUTHBOUND														
MM 273	2	Curve improvements		✓				✓				✓		
EXIT 269	3	Extend acceleration lane	✓				✓	✓		✓	✓			

Potential Solutions Development

I-81 – Mile Marker 279-295: Potential Solutions

POTENTIAL SOLUTIONS			Targeted Issues					Contributing Factors					Goal Met	
Location	#	Potential Solutions	High Crash Frequency	High Crash Severity	Excessive Delay	Lane Closures >1 Hour	Traffic Volume	Grade	Curve	Ramp Spacing	Merge/Diverge Area	Reduce Crash Frequency	Reduce Crash Severity	Reduce Delay
NORTHBOUND														
EXIT 283	1	Extend deceleration lane	✓	✓						✓	✓	✓		
EXIT 291	2	Extend acceleration and deceleration lanes	✓				✓			✓	✓			
SOUTHBOUND														
MM 287 - 284	3	Shoulder Improvements	✓	✓	✓		✓				✓	✓	✓	
EXIT 283	4	Extend acceleration and deceleration lanes	✓		✓					✓	✓		✓	
EXIT 279	5	Extend acceleration lane	✓	✓						✓	✓	✓		

Potential Solutions Development

I-81 – Mile Marker 295-305: Funded Projects

FUNDED PROJECTS		
Location	#	Funded
EXIT 296	1	Extend northbound acceleration lane and southbound deceleration lane (2024)
EXIT 300	2	Extend southbound acceleration lane (2024)

Potential Solutions Development

I-81 – Mile Marker 295-305: Potential Solutions

POTENTIAL SOLUTIONS			Targeted Issues				Contributing Factors				Goal Met			
Location	#	Potential Solutions	High Crash Frequency	High Crash Severity	Excessive Delay	Lane Closures >1 Hour	Traffic Volume	Grade	Curve	Ramp Spacing	Merge/Diverge Area	Reduce Crash Frequency	Reduce Crash Severity	Reduce Delay
NORTHBOUND														
EXIT 296	3	Extend deceleration lane	✓	✓	✓	✓		✓			✓	✓	✓	✓
EXIT 296-298	4	Add auxiliary lane between Exit 296 and Exit 298	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
EXIT 298-300	5	Add auxiliary lane between Exit 298 and Exit 300			✓		✓	✓	✓	✓				✓
EXIT 300	6	Widen ramp to eastbound I-66 to two lanes			✓		✓	✓	✓	✓				✓
EXIT 302	7	Extend acceleration and deceleration lanes		✓						✓	✓		✓	
MM 304	8	Extend deceleration lane at truck scales		✓						✓	✓		✓	
SOUTHBOUND														
EXIT 300 - MM 296	9	Widen to three lanes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
EXIT 298	10	Extend deceleration lane			✓	✓	✓	✓	✓	✓				✓
EXIT 296	11	Extend acceleration lane	✓	✓	✓	✓		✓			✓	✓	✓	✓

Potential Solutions Development

I-81 – Mile Marker 305-324: Funded Projects

FUNDED PROJECTS		
Location	#	Funded
EXIT 310	1	Interchange modification project (2017)
EXIT 315	2	Extend northbound deceleration lane (2024)
EXIT 315	3	Install queue preemption on northbound off-ramp (2016)
EXIT 317	4	Extend northbound deceleration lane (2013)
EXIT 323	5	Extend northbound deceleration and southbound acceleration lane (2021)

Potential Solutions Development

I-81 – Mile Marker 305-324: Potential Solutions

POTENTIAL SOLUTIONS			Targeted Issues				Contributing Factors				Goal Met			
Project	#	Potential Solutions	High Crash Frequency	High Crash Severity	Excessive Delay	Lane Closures >1 Hour	Traffic Volume	Grade	Curve	Ramp Spacing	Merge/Diverge Area	Reduce Crash Frequency	Reduce Crash Severity	Reduce Delay
NORTHBOUND														
EXIT 313-315	6	Add auxiliary lane between Exit 313 and Exit 315	✓			✓		✓	✓	✓		✓		
SOUTHBOUND														
EXIT 315-313	7	Add auxiliary lane between Exit 315 and Exit 313	✓	✓	✓			✓	✓	✓		✓	✓	

Potential Solutions Development

Capital Projects in Staunton District

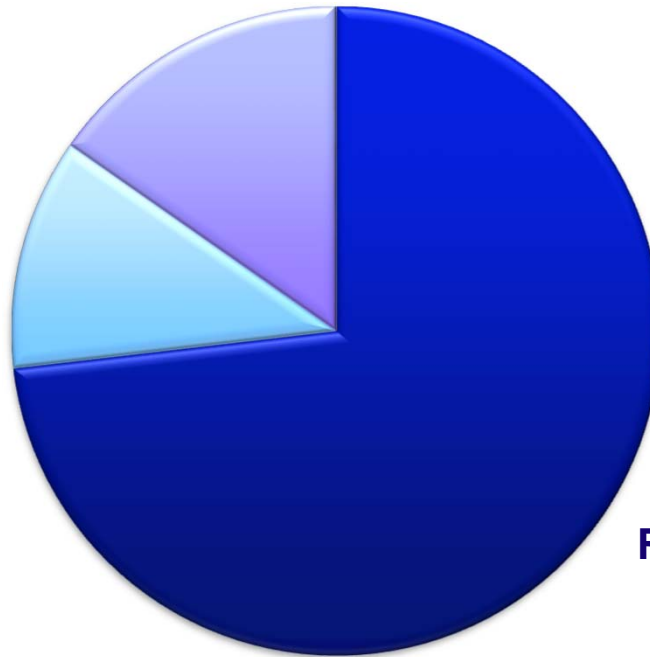
- **Recently Completed and Funded Projects: \$67.9 Million**
 - Includes projects completed in the last five years, projects funded under SMART SCALE rounds 1 and 2, as well as major bridge rehabilitations/ replacements
- **Potential Capital Solutions: \$1.0-1.6 Billion**

Multimodal Components

Virginia Investments in the I-81 Rail Corridor (2007 to present)

Rail Industrial Access
\$12,252,312

Rail
Preservation
\$9,268,610



\$80,175,347
spent in the
past decade

Rail Enhancement
\$58,654,425

Multimodal Components

Rail Freight Traffic

- By 2025, 78 million tons will be moved by rail in the I-81 corridor

Rail Freight

2012	2025
Rail Freight Value \$47 Billion	Rail Freight Value \$61 Billion
Rail Freight Tonnage 70 Million Tons	Rail Freight Tonnage 78 Million Tons
Freight Value per Ton \$653	Freight Value per Ton \$774
Corridor Tonnage Passing Through 46%	Corridor Tonnage Passing Through 47%

Corridor Freight Flows by Rail



Multimodal Components

Potential Expanded Passenger Service

Current Passenger Service

- **FY17 Amtrak Ridership in the I-81 Corridor:**
 - **Roanoke: Service began 10/31/17**
 - **Lynchburg: 82,251**
 - **Staunton: 6,487**
 - **Clifton Forge: 2,339**



Revenue Options

Major Interstate Corridor Funding SMART SCALE vs. Other Resources

Interstate	SMART SCALE	Regional/Tolls/Other
I-64	\$397	\$1,179
I-66	0	\$2,680
I-77	\$5	0
I-81	\$168	0
I-85	0	0
I-95/I-395	\$220	\$940

Figures in millions

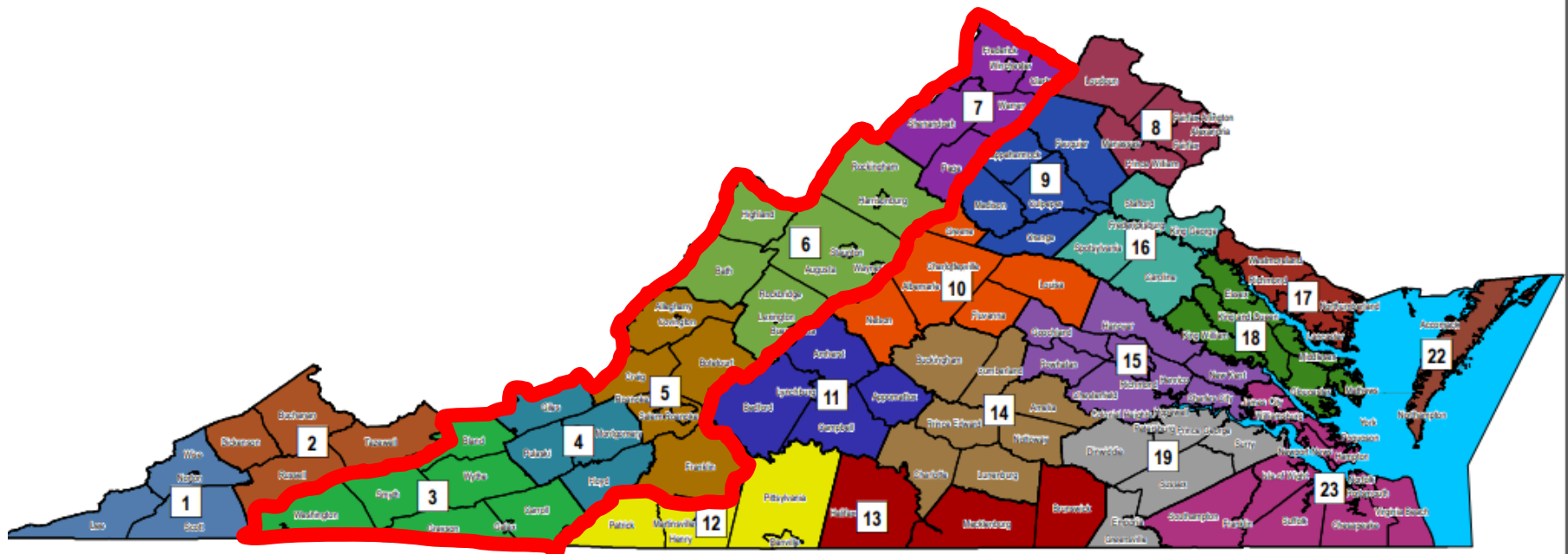
Potential Funding Options

- **Heavy commercial vehicle tolling options –**
 - \$50-\$200M/year
- **Regional 2.1% motor fuels tax –**
 - \$60-\$70M/year
- **Regional 0.7% retail sales and use tax –**
 - \$90-\$100M/year
- **Regional taxes would impact all localities in PDCs 3, 4, 5, 6, 7**

All funding options require General Assembly legislation

Potential Funding Options

- Regions impacted by a potential motor fuels or retail sales and use tax for I-81 Corridor



Tolling and Potential Tolling Revenue

- **What is open road tolling?**
 - Collect tolls without using a toll booth
 - Heavy commercial trucks
- **Who approves tolling process?**
 - Virginia Legislature
 - Federal Highway Administration



Toll revenues may only be used to benefit the corridor on which they were collected.

High Occupancy Toll (HOT) Lane Tolling Concept

- **Preliminary evaluations of tolling scenarios eliminate HOT lane tolling concept for the following reasons:**
 - **HOT lanes are a powerful tool to manage recurring congestion in urban areas with significant traffic and delays during peak hours**
 - **I-81 corridor is mostly rural and only 20% of the delay on the entire corridor is recurring congestion**
 - **HOT lanes are typically converted from pre-existing HOV lanes to use untapped capacity**
 - **There are currently no HOV lanes on I-81**
 - **Cost to create a HOT lane on I-81 would be in excess of the toll revenue generated by the HOT lane**

Public Meeting Displays

Public Meeting Displays

- **Background information**
- **Display boards with proposed solutions**
- **Comment sheets with questions to *provide your input***

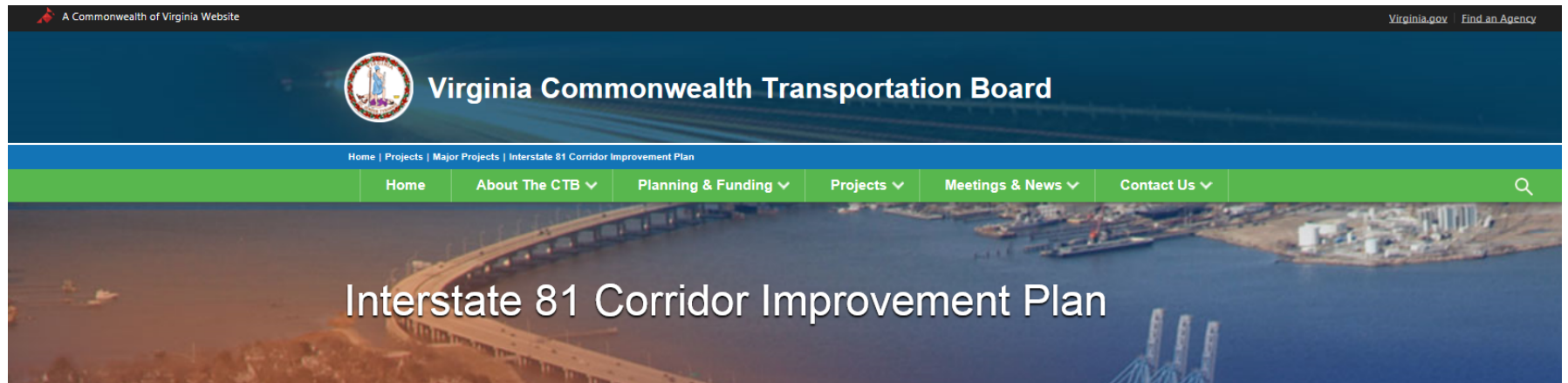
Next Steps

- **Analyze potential capital projects to assess benefits relative to costs using SMART SCALE process**
- **Review potential funding and financing options**
- **Develop prioritized list of potential capital projects**
- **Complete truck parking needs assessment**
- **Complete analysis of potential economic impacts of heavy commercial vehicle tolls on Virginia agriculture, manufacturing and logistics sectors**

Next Steps

- **October Public Meetings throughout the Corridor**
- **Commonwealth Transportation Board briefing on draft plan at its October meeting**
- **Commonwealth Transportation Board consideration of final plan at its December meeting**
- **Plan to be submitted to the General Assembly no later than the first day of the 2019 Session**

Providing Feedback...VA81Corridor.org



Project website: <http://www.VA81Corridor.org>

Project e-mail address: VA81CorridorPlan@OIPI.Virginia.gov

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Thank you for coming tonight and providing your feedback!

