COMMONWEALTH *of* VIRGINIA

Office of the

SECRETARY *of* TRANSPORTATION

I-81 Corridor Improvement Plan

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Deputy Secretary of Transportation

December 4, 2018

I-81 Corridor Overview – Critical to Movement of Goods in Eastern U.S.

11.7
MILLION TRUCKS PER YEAR

$312
BILLION IN GOODS PER YEAR

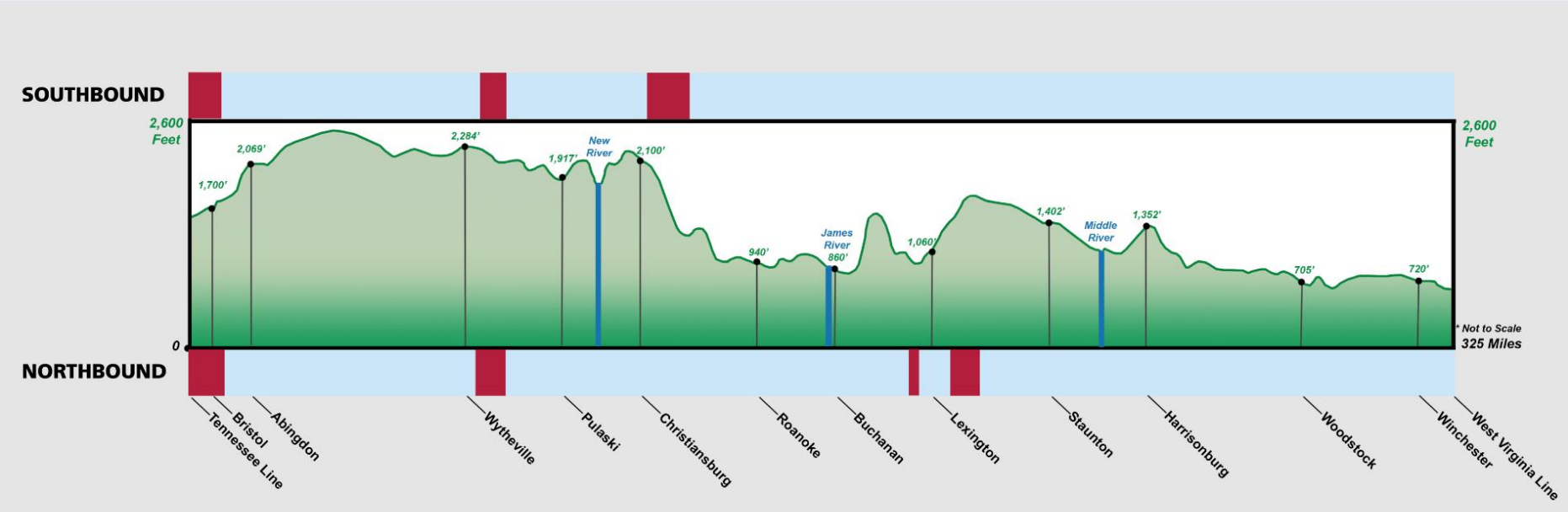
42%
OF STATEWIDE INTERSTATE TRUCK VMT

45+
CRASHES PER YEAR
(WITH CLEARANCE TIMES GREATER THAN 4 HOURS)

~11,000
CRASHES OVER 5 YEARS

Includes TRANSEARCH INSIGHT and VDOT data 2012-2016

I-81 Corridor Overview – Terrain has an Impact

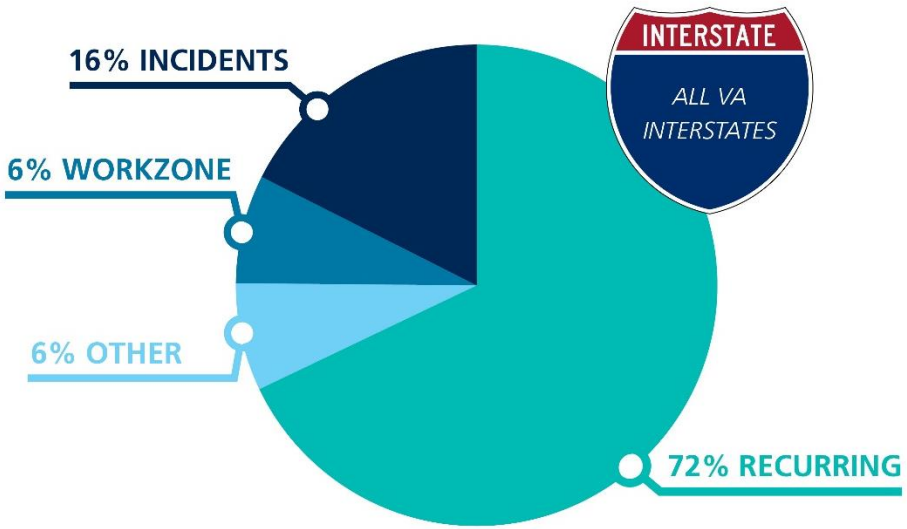


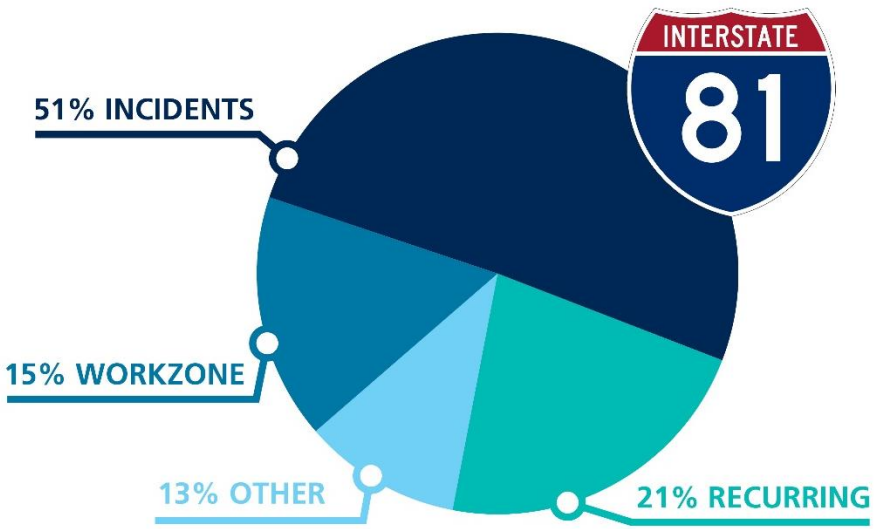
LEGEND: 3-LANE SECTION

2-LANE SECTION

I-81 Corridor Operations Plan

Delay Makes I-81 Unique





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

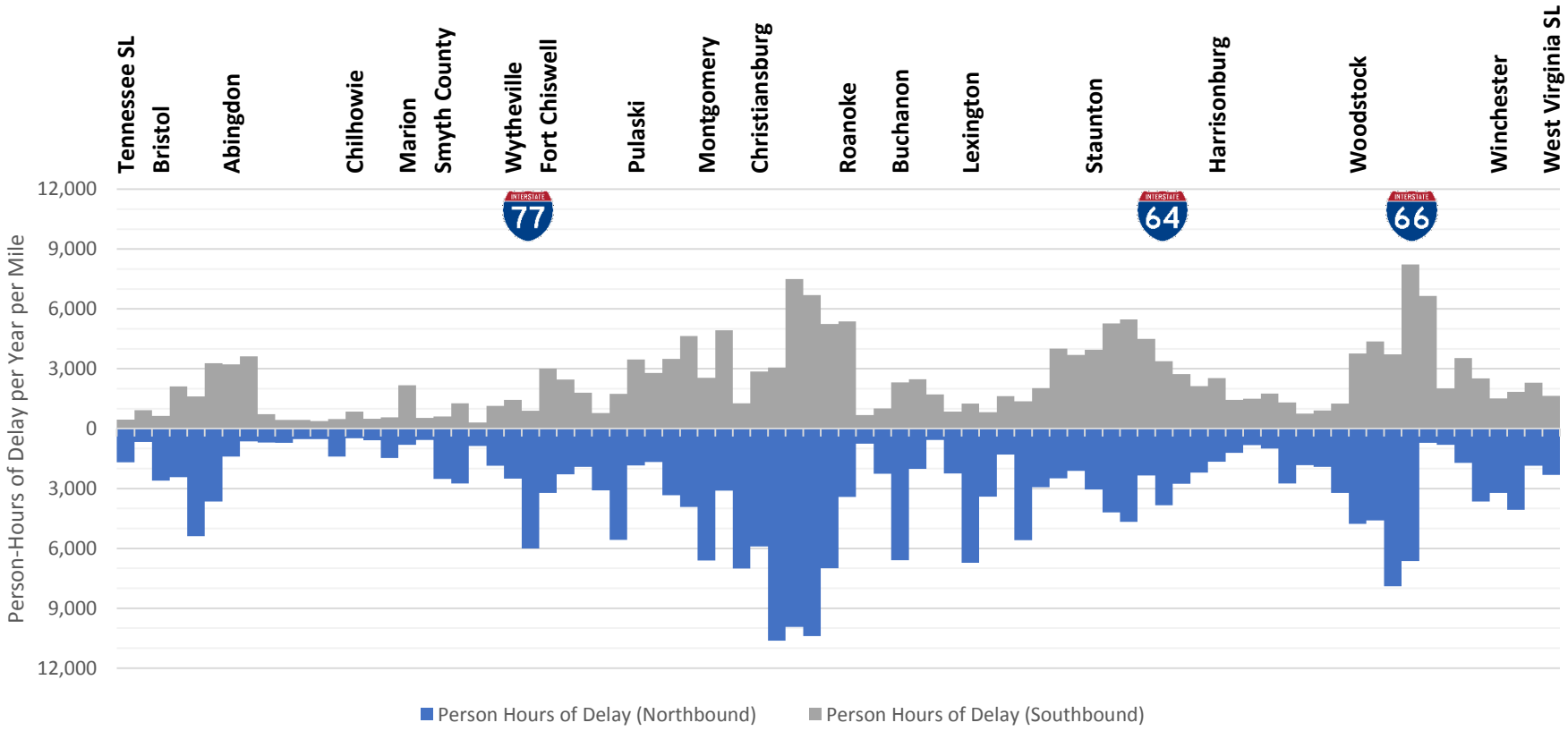
I-81 Corridor Improvement Plan

- Review of top problem areas
- Identification of potential solutions for each problem area and operations plan
- Prioritization of potential solutions and recommended improvement plan
- Development of potential financing options
- Economic impact analysis of tolling

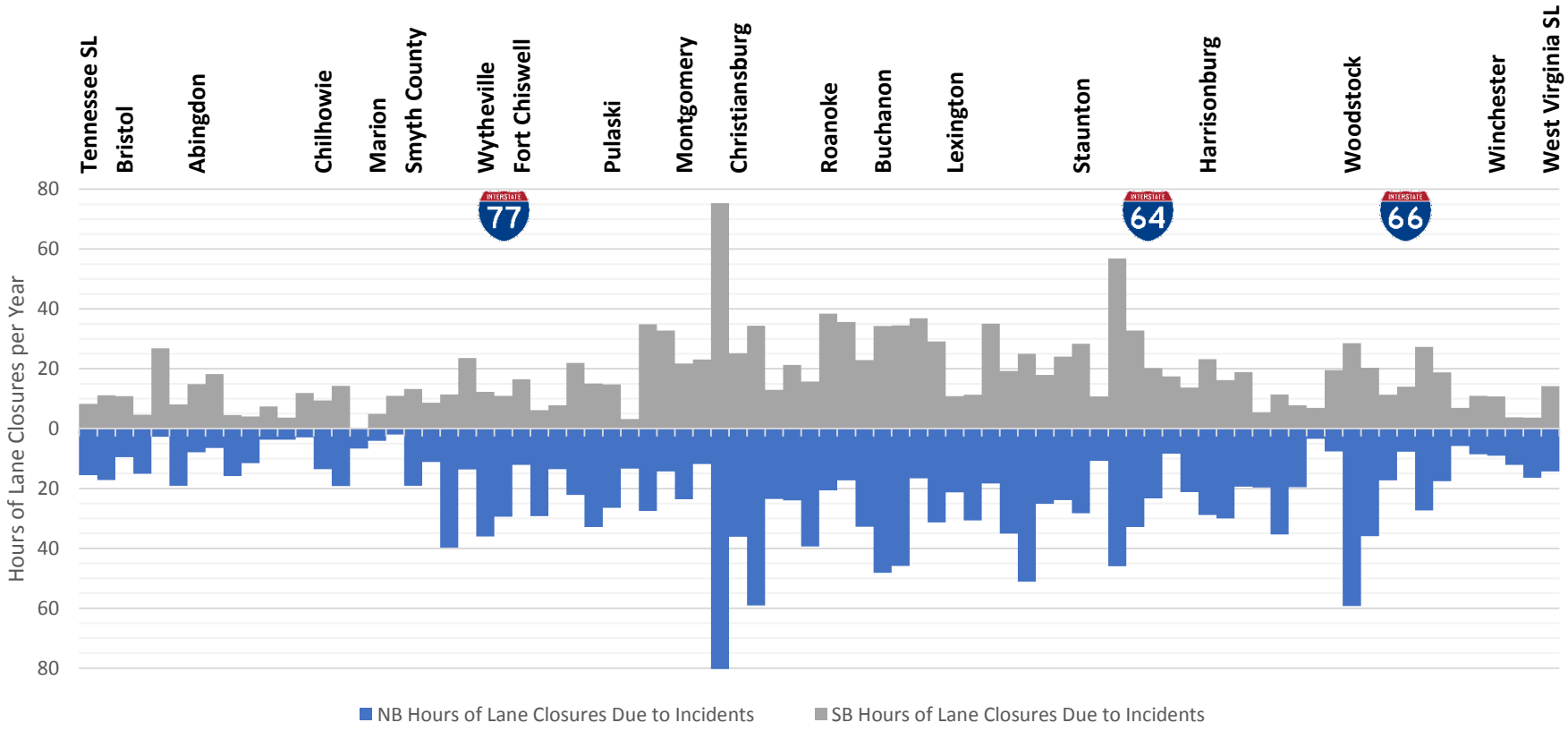
Public Engagement

- 12 public input meetings
  - 950+ attendees
- 5 Commonwealth Transportation Board briefings
- 2000+ comments received from the public

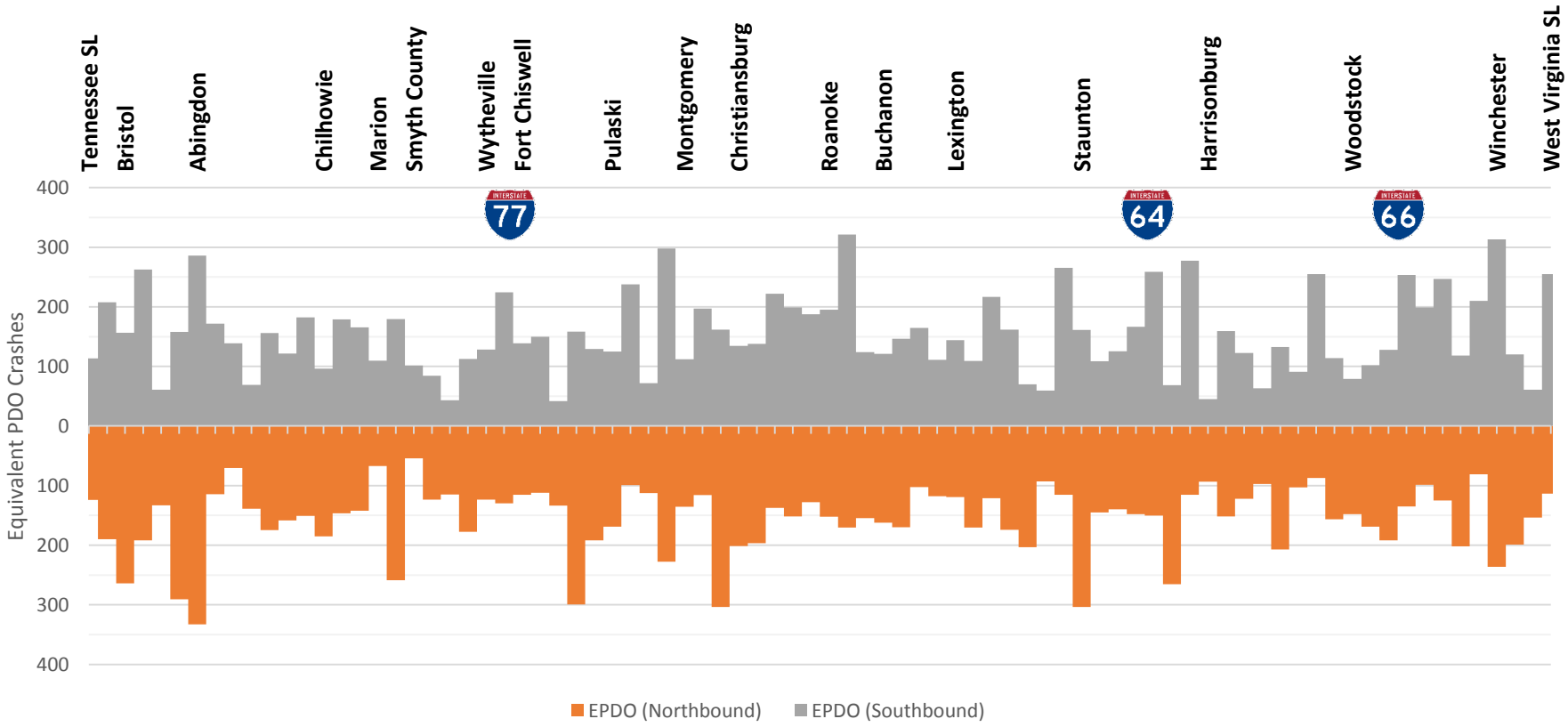
Person Hours of Delay between Interchanges - Average per One Mile Segment



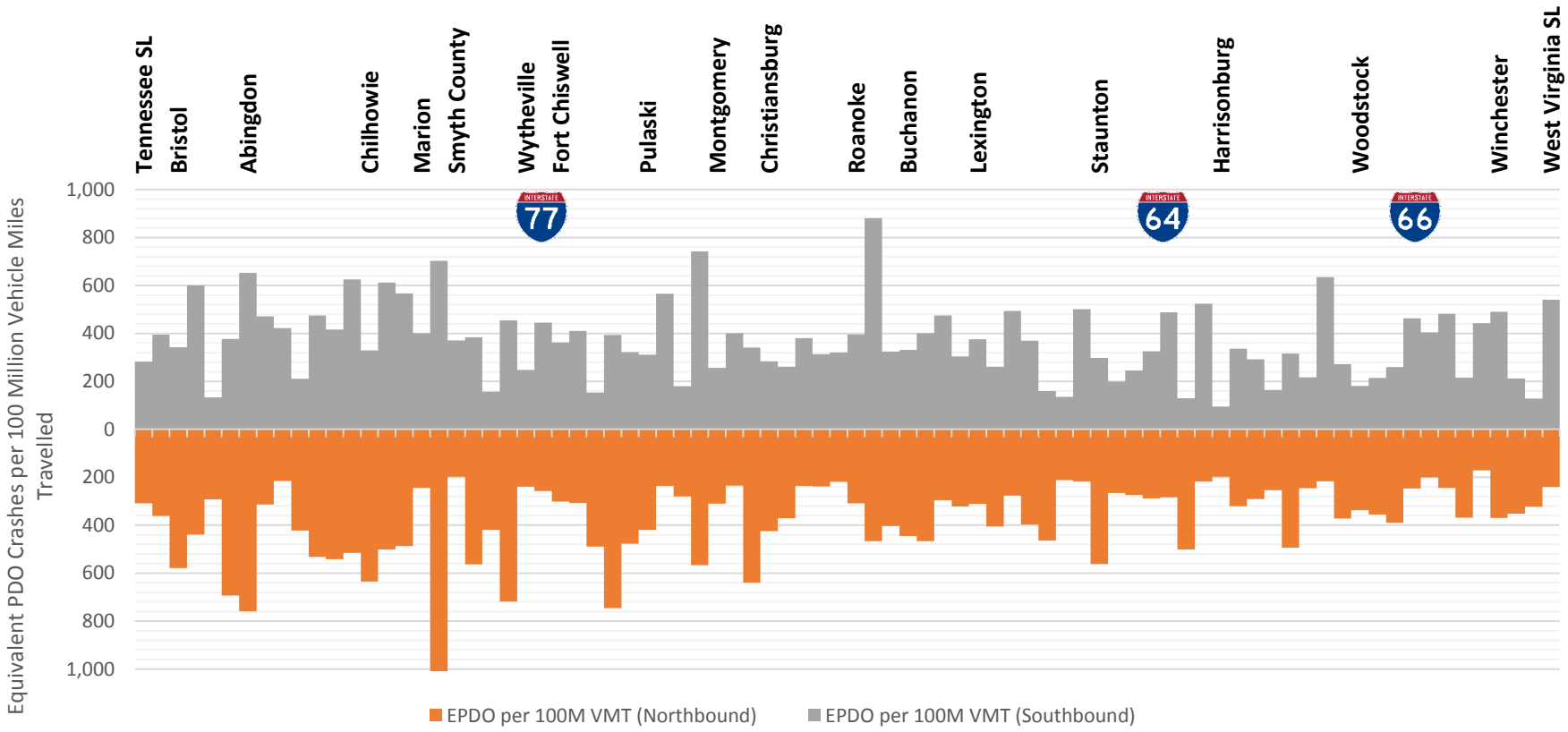
Duration of Incident - Related Lane Closures between Interchanges



Equivalent Property Damage Only – One-Mile Segments

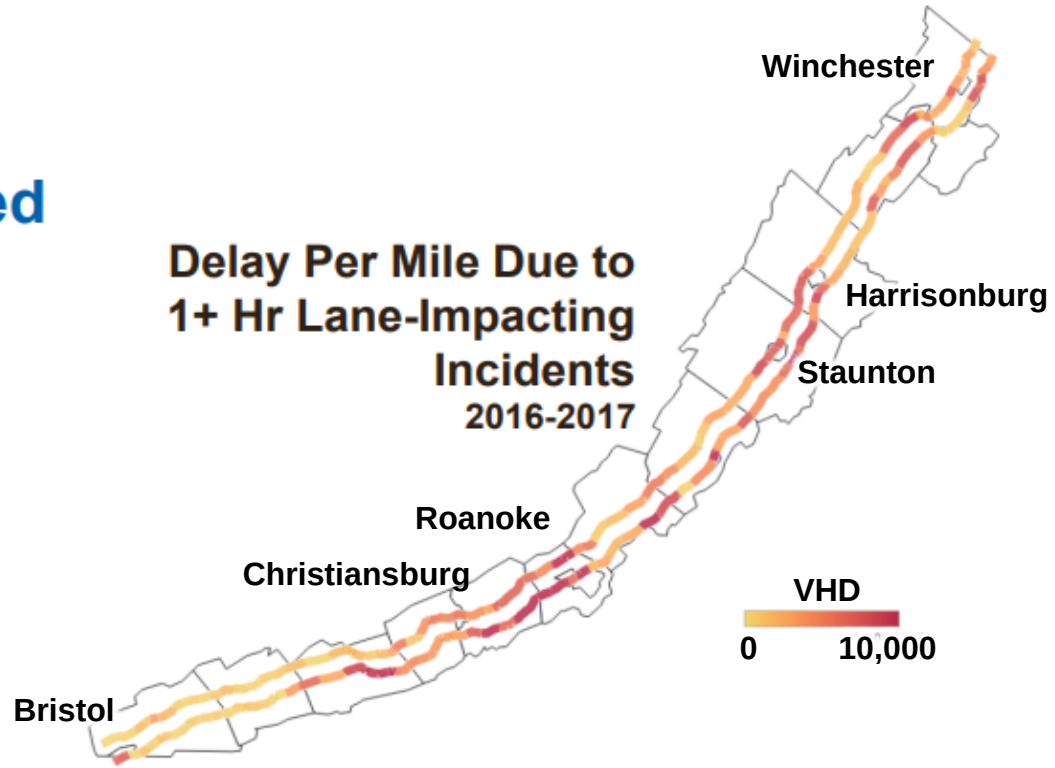


EPDO per 100M VMT – One Mile Segments



I-81 Operational Improvements

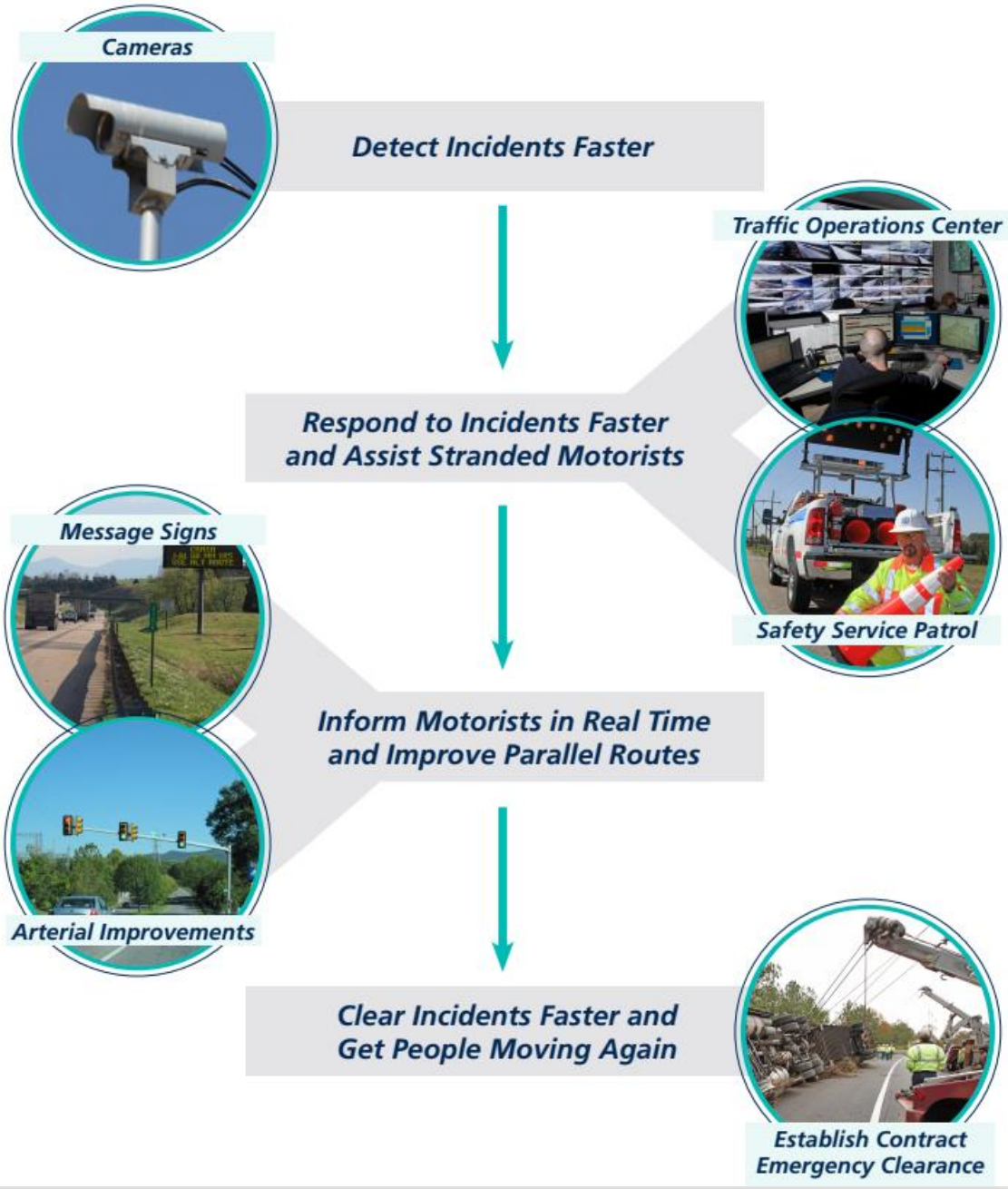
- Focused on corridor segments with the highest incident-related delay
- Identified crash hotspots
- Developed corridor-wide operations and incident management upgrade plan



I-81 Operational Improvements 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



I-81 Operational Improvements Plan
Summary Recommendations

Improvement	Estimated Implementation Cost	Estimated Annual O&M Cost
Expand Traffic Cameras & CMS	$10,750,000	$ 615,600
Enhanced Safety Service Patrols	$1,663,000	$1,744,200
Contract Emergency Clearance	$3,500,000	$3,591,000
Parallel facilities Improvements	$27,100,000	
TOTAL	$43,000,000	**$5,950,800**

Recommendations:

- Place 24 new CMS on the mainline
- Place 10 new CMS on feeder routes
- Place 37 new cameras at interchanges
- Place 8 new cameras at high incident locations
- Upgrades to parallel routes in key locations

Identifying I-81 Capital Improvements

- **Reviewed each problem area identified by performance measures**

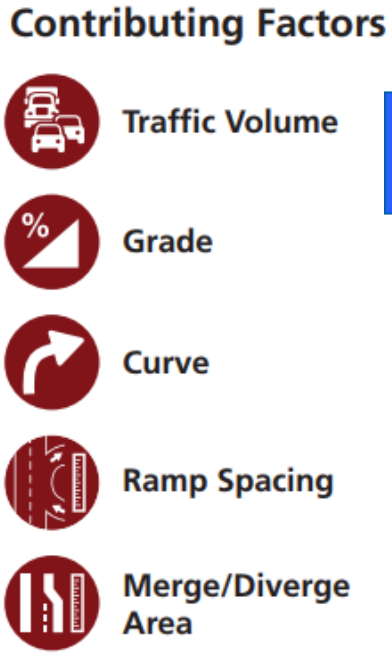
Crash Frequency

Crash Severity

Person-Hours of Delay

Incident/Crash Lane Closure > 1 Hour

- **Determined contributing factors**



- **Developed potential solutions based identified contributing factors – a total cost of $4 billion**

Prioritization of Potential Capital Improvements

- **Focused on capital improvements package of $2 billion based on industry capacity feedback – approximately ½ of cost of all improvements**

- **Evaluated all potential capital improvements using SMART SCALE-like process with benefits determined as follows:**
  - **40% based on person hours of delay**
  - **40% based on change in crash frequency**
  - **20% based on change in access to jobs**

$2 billion in I-81 Plan Capital Improvements

District	Number of Projects by Type								
	Widening	Auxiliary Lane	Truck Climbing Lane	Acceleration Lane Extension	Deceleration Lane Extension	Curve Improvement	Shoulder Widening	Total Number of Projects	Total Cost (millions $)
Bristol District	1	3	3	6	10	4	0	27	**$285.2**
Salem District	4	0	0	4	2	3	0	13	**$875.3**
Staunton District	4	1	2	10	4	1	1	23	**$838.1**
Total I-81 Corridor Number of Improvements	**9**	**4**	**5**	**20**	**16**	**8**	**1**	**63**	**$1,998.8**

Bristol District Recommendations Highlights

- Widen southbound to three lanes between Exit 10 and Exit 7
- Add northbound truck climbing lane from Exit 32
- Add a southbound truck climbing lane between MM 34 and MM 33
- Add northbound truck climbing lane from Exit 39
- Add SB auxiliary lane between Exit 54 and Smyth Safety Rest Area
- Add SB auxiliary lane between Exit 40 on I-77 and Exit 72 on I-81 and extend acceleration lane
- Add SB auxiliary lane between Exit 73 and Exit 72

Salem District Recommendations Highlights

- **Widen northbound to three lanes from MM 119 to Exit 128**
- **Widen northbound to three lanes from Exit 128 to Exit 137**
- **Widen northbound and southbound to three lanes from Exit 137 to Exit 141**
  - Links up with SMART SCALE funded improvements from 141 to 143
- **Widen northbound and southbound from MM 144 to Exit 150**

Staunton District Recommendations Highlights

- Add southbound auxiliary lane between Exit 221 and Exit 220
- Widen northbound and southbound to three lanes between Exit 225 and Exit 221
- Add northbound truck climbing lane between MM 234 & 237.9
- Add southbound truck climbing lane between MM 238 & 235.6
- Widen northbound and southbound to three lanes between Exit 243 and Exit 248
- Widen southbound to three lanes between MM 300.1 and 296.7
- Widen northbound and southbound to three lanes between Exit 313 & Exit 317

Summary Benefit Results from Prioritized Capital Improvements

- **By deploying $2 billion of capital improvements along the I-81 corridor*:**
  - **Annual vehicle hours of delay will be reduced, on average, by more than 6 million**
    - Trucks will capture more than 3.6 million vehicle hours of annual delay reductions
    - Reductions related to construction of capital improvements responsible for more than 90% of these benefits
  - **Annual statistical crashes are anticipated to be reduced, on average, by almost 450 across the entire corridor**
    - Approximately 29% of the reduction in annual statistical crashes (representing almost 130 crashes) involve an injury

* Estimated based on the share of vehicle delays generated by projects included in list of $2 B improvements compared to total vehicle delays generated by all improvements considered in the corridor. Estimate includes benefits related to Operational Improvements

On-Going Items

- **Establish Truck Parking Task Force**
- **Establish Speed Enforcement Task Force**
- **Develop Multimodal Improvements**
- **Plan sets aside $100M to implement these items**

I-81 Financing Options

I-81 Financing Options

- **Legislation provided direction on the financing options to be considered**
  - **Evaluate feasibility of using toll financing**
  - **Do not consider tolls on commuters**
  - **May consider tolls on heavy commercial vehicles**
  - **May consider High Occupancy Toll Lanes**
  - **Evaluate other financing means**

- **Financing options presented are sufficient to fund the recommendations through a mix of debt financing and pay-as-you-go funding**

Financing Options

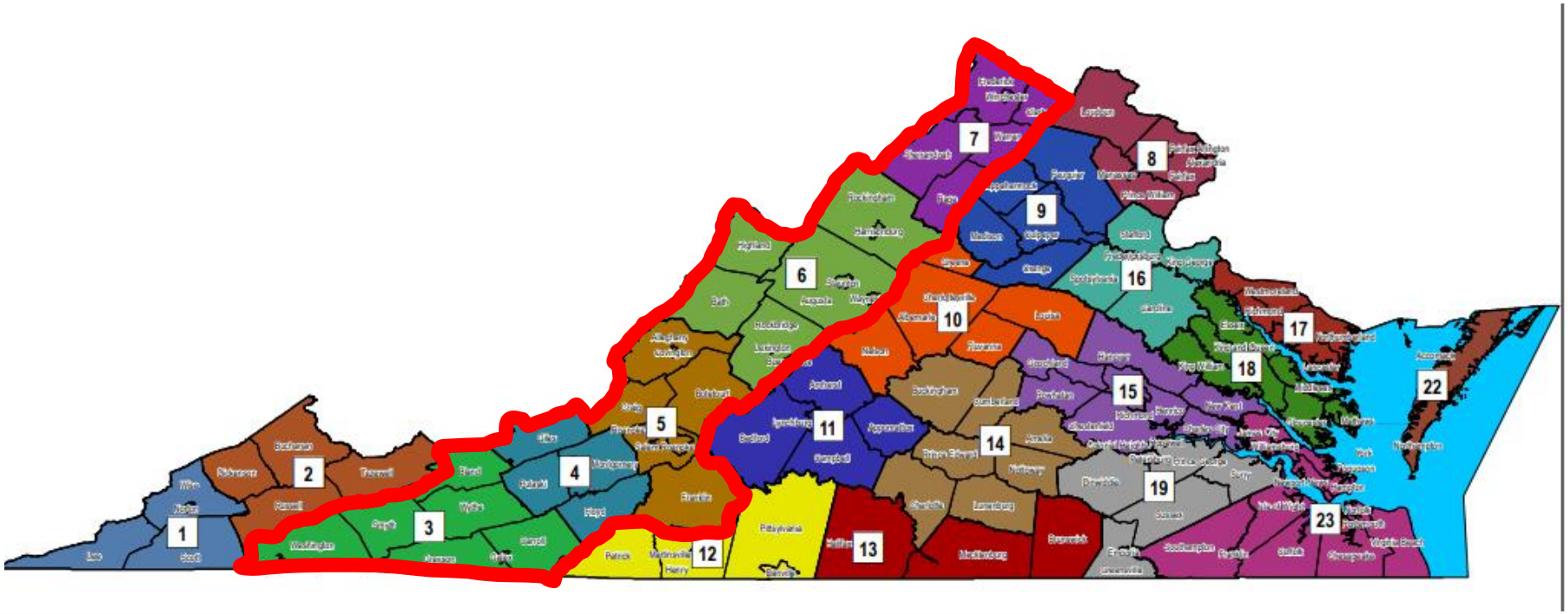
Regional Tax Option	Rate	Revenue Generated
Retail Sales and Use Tax	0.7%	$105
Regional Fuels Tax	2.1%	$60

Tolling Option	Rate	Revenue Generated
Time of Day Tolling with I-81 Auto Annual Pass	Variable	$145

*** Figures in millions and for FY2020**

Key Financial Plan Assumptions
Regional Taxes Like Northern Virginia & Hampton Roads

- Collect motor fuels and/or retail sales & use tax in PDCs 3-7
- Regional authority to manage revenues and financing



Tolling Option Must Meet State Requirements

- **§ 33.2-309 of the *Code of Virginia* requires any imposition of tolls for use of the interstate system to be for the stated purpose of:**
  - **Financing interstate construction and reconstruction;**
  - **Promoting efficiency;**
  - **Reducing traffic congestion; and**
  - **Improving air quality.**

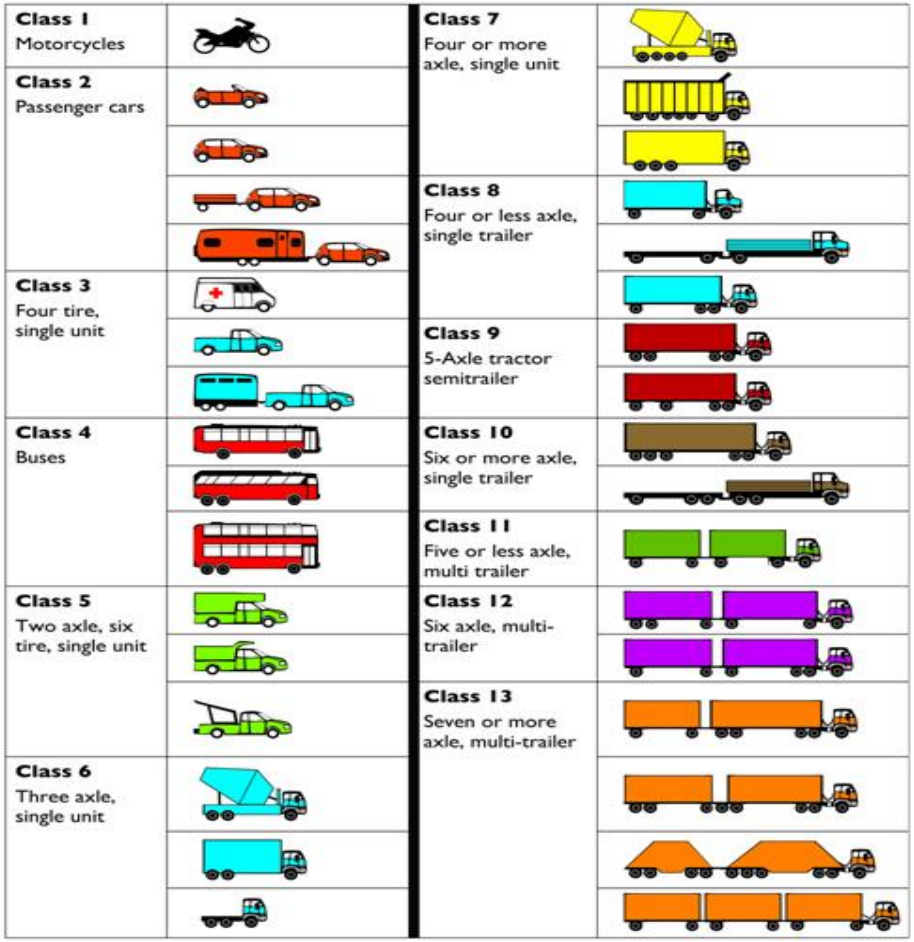
- **For I-81, § 33.2-119 of the *Code* requires General Assembly approval prior to the imposition and collection of any toll for use or all or any portion**

Tolling Option Must Meet Federal Requirements

Program	Key Requirements	I-81 Corridor Qualify?
Value Pricing Pilot Program	Tolls may be imposed on existing toll-free highways, bridges & tunnels so long as variable pricing is used to manage demand. No formal federal approval process other than NEPA	**Yes**, implement nighttime and daytime toll rates
Interstate System Reconstruction & Rehab. Pilot Program	Convert existing interstate system into a toll facility in conjunction with needed reconstruction & rehab that is only possible with the collection of tolls. Requires formal federal approval including NEPA	**Yes**, on 10-2-2018 FHWA issued a call for applications for 3 available slots on a first-come, first serve basis
Section 129 (General Toll Program)	Initial construction of new lanes on highways, bridges, & tunnels and reconstruction, restoration, or rehabilitation as long as number of toll-free lanes are not reduced. Requires formal federal approval including NEPA	**Yes**, as long as toll gantries are near or on reconstructed or rehabilitated bridges
Section 166 (HOV/HOT Lanes)	Allow toll-paying vehicles that do not meet minimum occupancy standards to use HOV lanes. No formal federal approval process other than NEPA	**No**, no existing HOV lanes

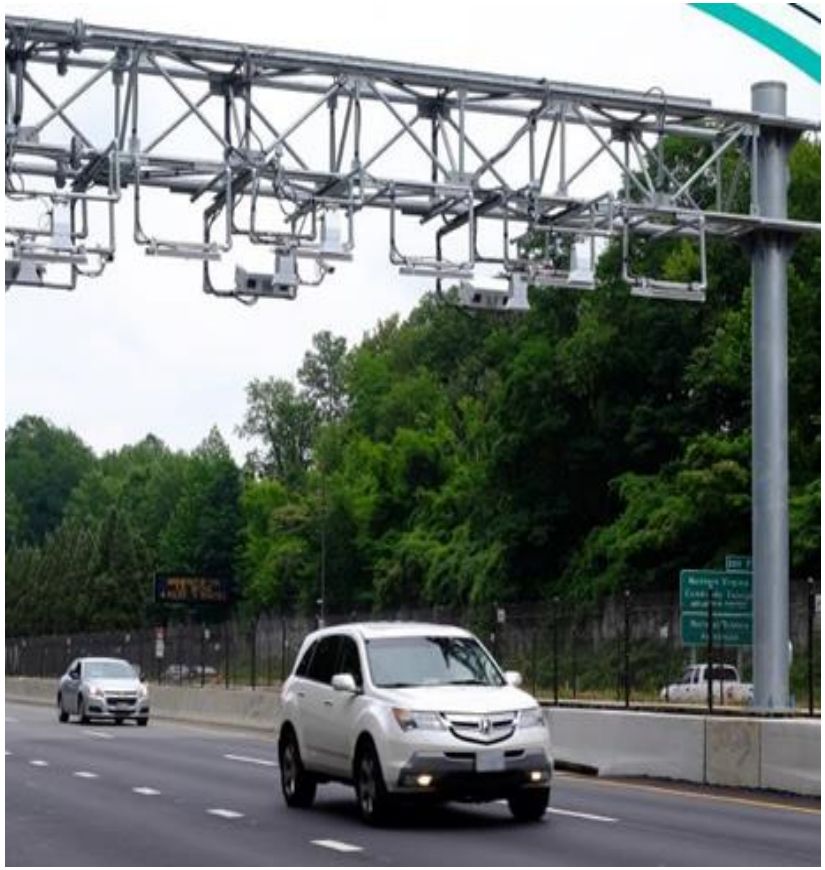
Key Definitions for Financing Options
Heavy commercial vehicle and commuters

- **Heavy Commercial Vehicle or "Trucks"**
  - **No uniform definition of term**
  - **Study assumed FHWA Classes 6 – 13**
  - **Surrounding states define similarly but lower axles (Class 5)**
- **Commuters travel first two gantries free**
- **Auto Annual Pass could eliminate commuter/non-commuter distinction**



Key Financing Options Assumptions
Tolling

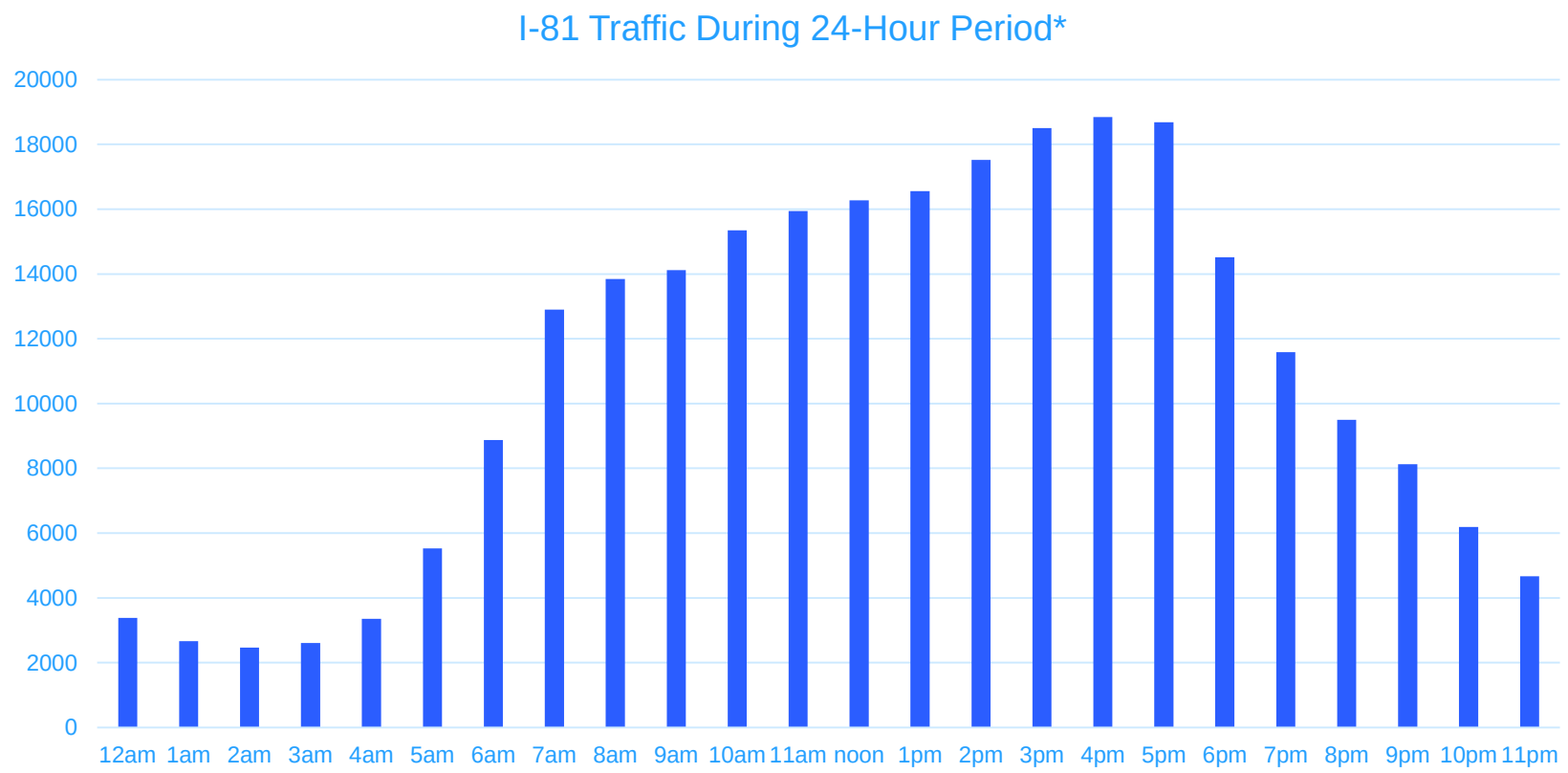
- **Collect per mile tolls without using a toll booth via:**
  - **Transponder (E-ZPass)**
  - **Video (image-based)**
  - **I-81 Auto Annual Pass**
- **6 toll gantries for 325 miles**
  - **Intersections with other interstates**
  - **Near state borders**
  - **Between urbanized areas**
  - **Closest assumed 2 locations are about 40 miles apart**



Toll Financing Option

- **Toll rates will vary between Trucks and Autos**
  - Trucks – 15¢ per mile during daytime; 7.5¢ per mile during nighttime
  - Autos – 7.5¢ per mile during daytime; 5¢ per mile during nighttime
  - All Autos may purchase $30 Annual Pass and gain unlimited access to I-81 for that year
- **Time of Day Tolling**
  - Tolls would be variable with higher during ‘daytime’ – roughly 6:00am to 9:00pm and lower from 9:00pm to 6:00am ‘nighttime’
  - Goal is to encourage more efficient use of the corridor

I-81 Traffic by Time of Day



- ***Time of Day studies at key locations throughout the corridor**

Toll Financing Option
Auto Annual Pass can replace commuter distinction

- **I-81 Auto Annual Pass**
  - $30 annual fee allows ”autos” ability to pay an annual fee for unlimited use of the facility
  - Fee could be collected through DMV
  - Pass would be offered to auto commuters and other auto corridor users
- **Users of the corridor without I-81 Auto Annual Pass would pay full auto per mile toll rate**
- **Similar to toll discount programs in other nearby states**

Toll Financing Option
Goals and Strategies

<table>
<tr><th>Goal</th><th>Implementation Strategy</th></tr>
<tr><td>Financing construction and reconstruction</td><td>Toll rates generate sufficient revenues to finance the I-81 Corridor Improvement Plan; but is not a revenue maximization strategy</td></tr>
<tr><td>Reduce traffic congestion</td><td>Time of Day Variable tolling modifies driver behavior to encourage Truck off-hour usage; Establish toll rates and other programs that discourage diversion</td></tr>
<tr><td>Promote efficiency</td><td>Time of Day Variable tolling modifies driver behavior; toll collection is through multiple methods that require no stopping</td></tr>
<tr><td>Equity</td><td>Toll rates will be the same no matter how toll is paid (transponder or video toll); Use of video tolling will result in a processing fee because of higher collection costs</td></tr>
<tr><td>Federal approval</td><td>Toll rate setting and implementation with comply with federal requirements</td></tr>
<tr><td>Consider current toll rates of peers/ surrounding entities – per mile toll rate</td><td>
<table>
<tr><th>State</th><th>Truck Toll (4-axle)</th><th>Auto Toll</th></tr>
<tr><td>West Virginia Turnpike</td><td>18¢</td><td>4.4¢</td></tr>
<tr><td>North Carolina Triangle Expressway</td><td>69¢</td><td>17¢</td></tr>
<tr><td>Pennsylvania Turnpike</td><td>22¢</td><td>10¢</td></tr>
<tr><td>Maryland I-95</td><td>73¢</td><td>11¢</td></tr>
</table>
These states vary toll rates based on method of payment; rates shown are for transponders – the lowest toll rate available.
</td></tr>
</table>

Economic Impact Analysis

Economic Impact Analysis

- **Analyzed reduced transportation costs due to implementation of the Plan and tolling costs for Virginia Trucks**
- **Reduced transportation costs include**
  - **Reduced travel times**
  - **Reduced fuel and labor costs due to travel time savings**
  - **Reduced monetary costs due to less crashes**

Economic Impact Analysis - Virginia Trucks

Share of Transportation Costs Reduction	Share of Tolls	Net Reduction in Transportation Costs
$3,419	$2,303	$1,116

1.49 ratio of transportation cost reduction to toll cost

*** Figures in millions and 2017 dollars**

Economic Impact Analysis –
Agriculture, Logistics and Manufacturing

Net transportation cost reductions were converted into direct economic impacts

	Output	Value Added	Labor Income	TOTAL
All Sectors	$968.1	$582.6	$360.0	$1,910.7
Agriculture	$12.9	$4.4	$2.4	$19.6
Logistics	$7.5	$3.3	$2.7	$13.6
Manufacturing	$218.8	$78.3	$33.1	$330.2

Next Steps

- **Board consideration of report at December 5, 2018 Action Meeting**
- **Report will be finalized and posted on public website**
- **Report will be submitted to the General Assembly by January 9, 2019**

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