COMMONWEALTH *of* VIRGINIA

Office of the

SECRETARY *of* TRANSPORTATION

Interstate 95 Corridor Improvement Plan

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DMV www.dmvNow.com

VIRGINIA DEPARTMENT OF AVIATION

DRPT Virginia Department of Rail and Public Transportation

MVDB Motor Vehicle Dealer Board COMMONWEALTH OF VIRGINIA

VIRGINIA PORT AUTHORITY Jamestown Landing 1607 1952

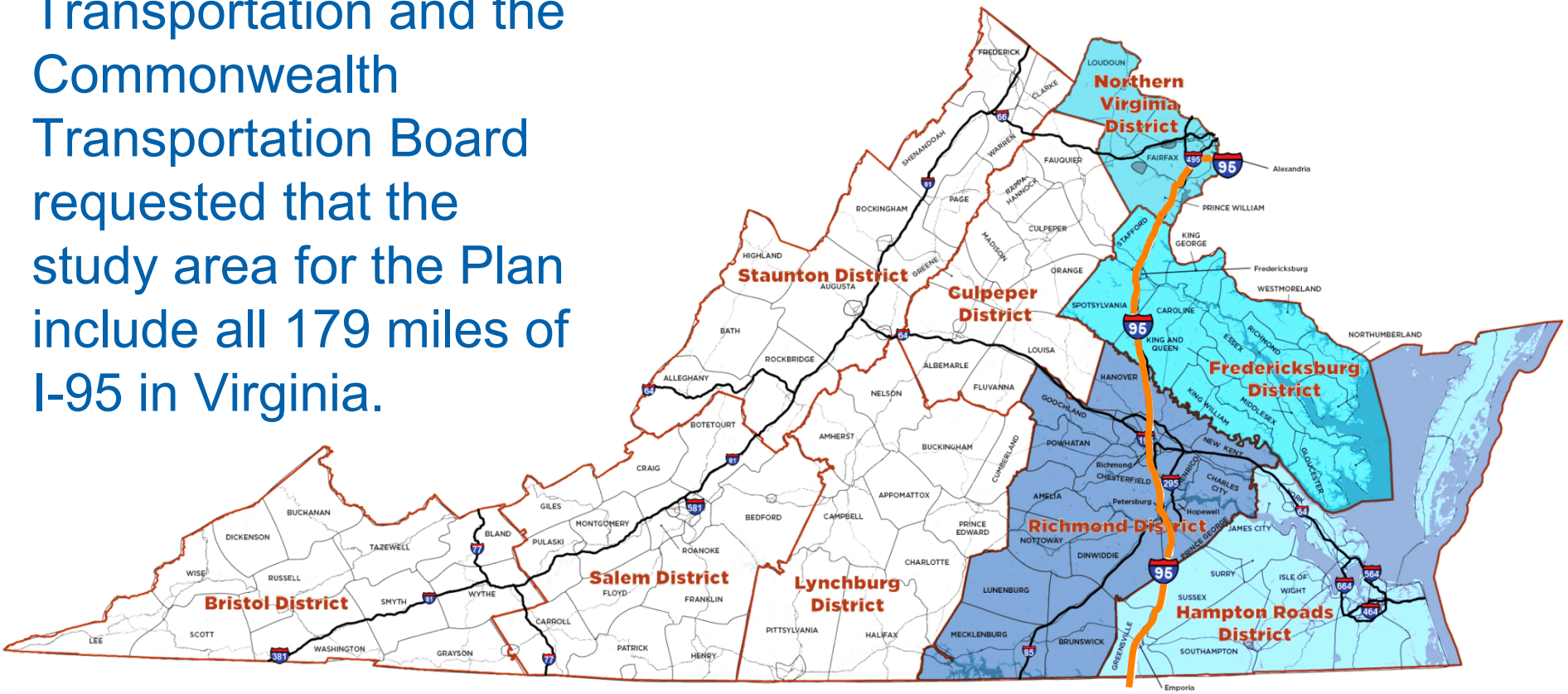
VDOT Virginia Department of Transportation

I-95 Corridor Improvement Plan- Progress to Date

- Problem identification
- Identification of potential solutions for each problem area and operations plan
- Prioritization and adoption of operations strategies
- Transforming Rail in Virginia

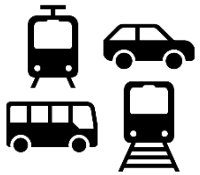
Study Area
I-95, Route 1, and Route 301 Corridors

The Secretary of Transportation and the Commonwealth Transportation Board requested that the study area for the Plan include all 179 miles of I-95 in Virginia.



I-95 Corridor Significance

Critical North-South Corridor



Multimodal Corridor

- Highway
- Metrorail
- VRE
- Vanpool
- Carpooling
- Slugging
- Commuter/Express Bus
- Park and Ride Lots
- Amtrak

9.0 Million

Trucks Per Year

> 3,700 Incidents Per Year

(With Average Clearance Times Almost 2 Hours)

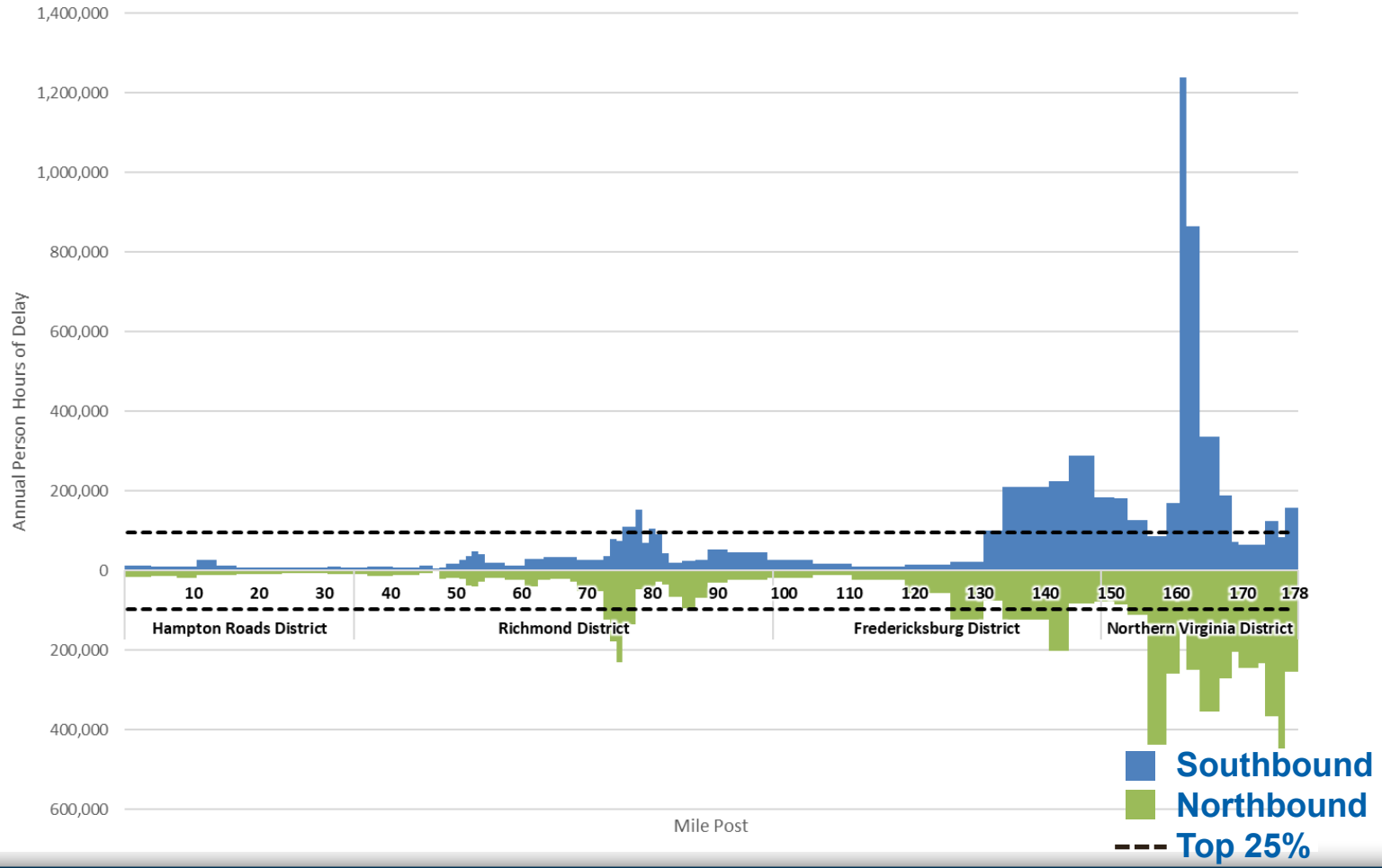
~ 21,000

Crashes Over 4 Years

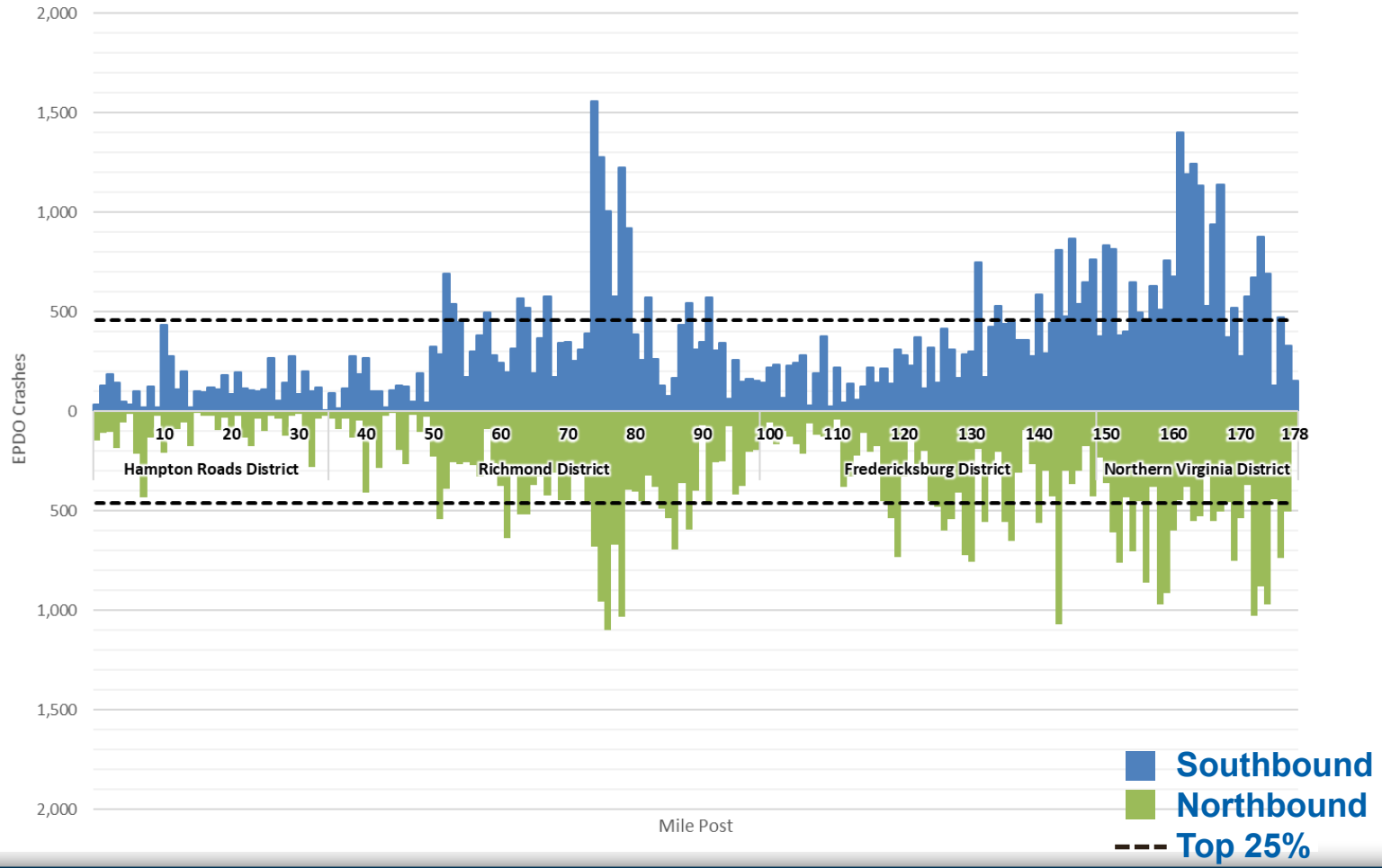
$195 Billion

in Goods Per Year

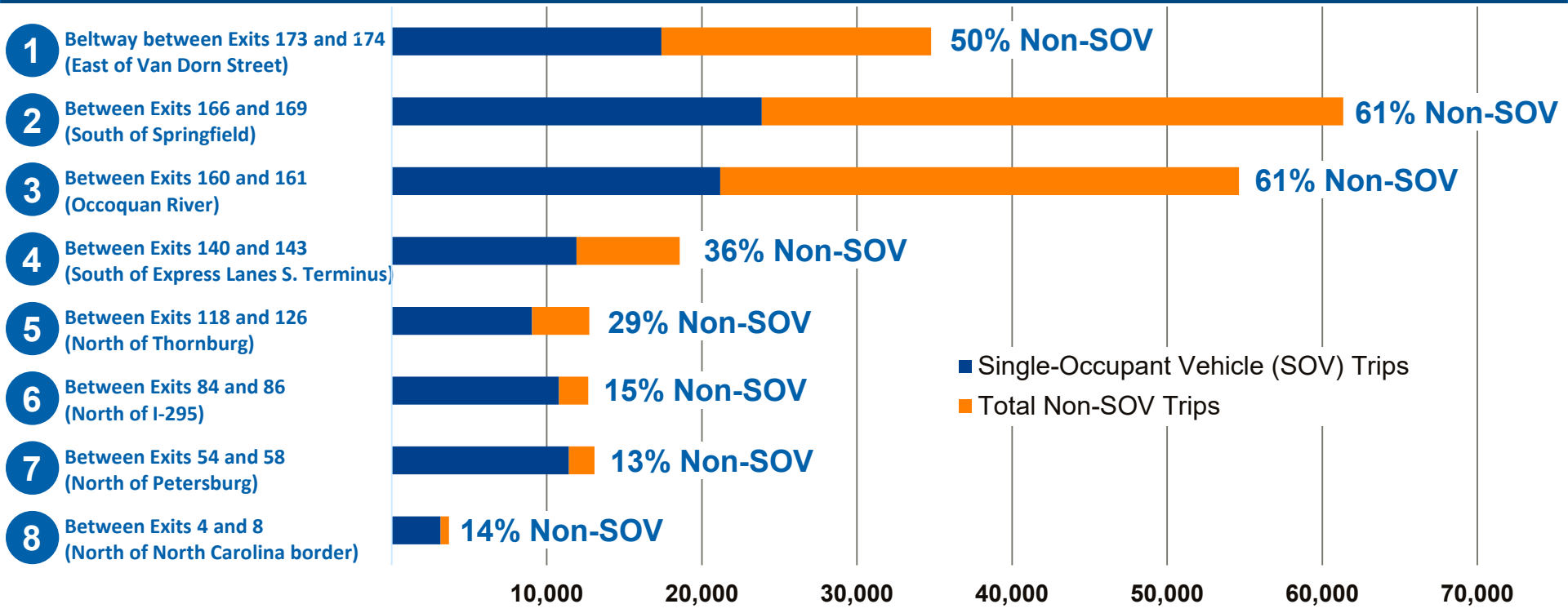
Focus Area: Occoquan
2018 Annual Delay Summary
One-Mile Segments



Crash Frequency and Severity Summary
One-Mile Segments



Persons Moved on Northbound I-95 in AM
Existing



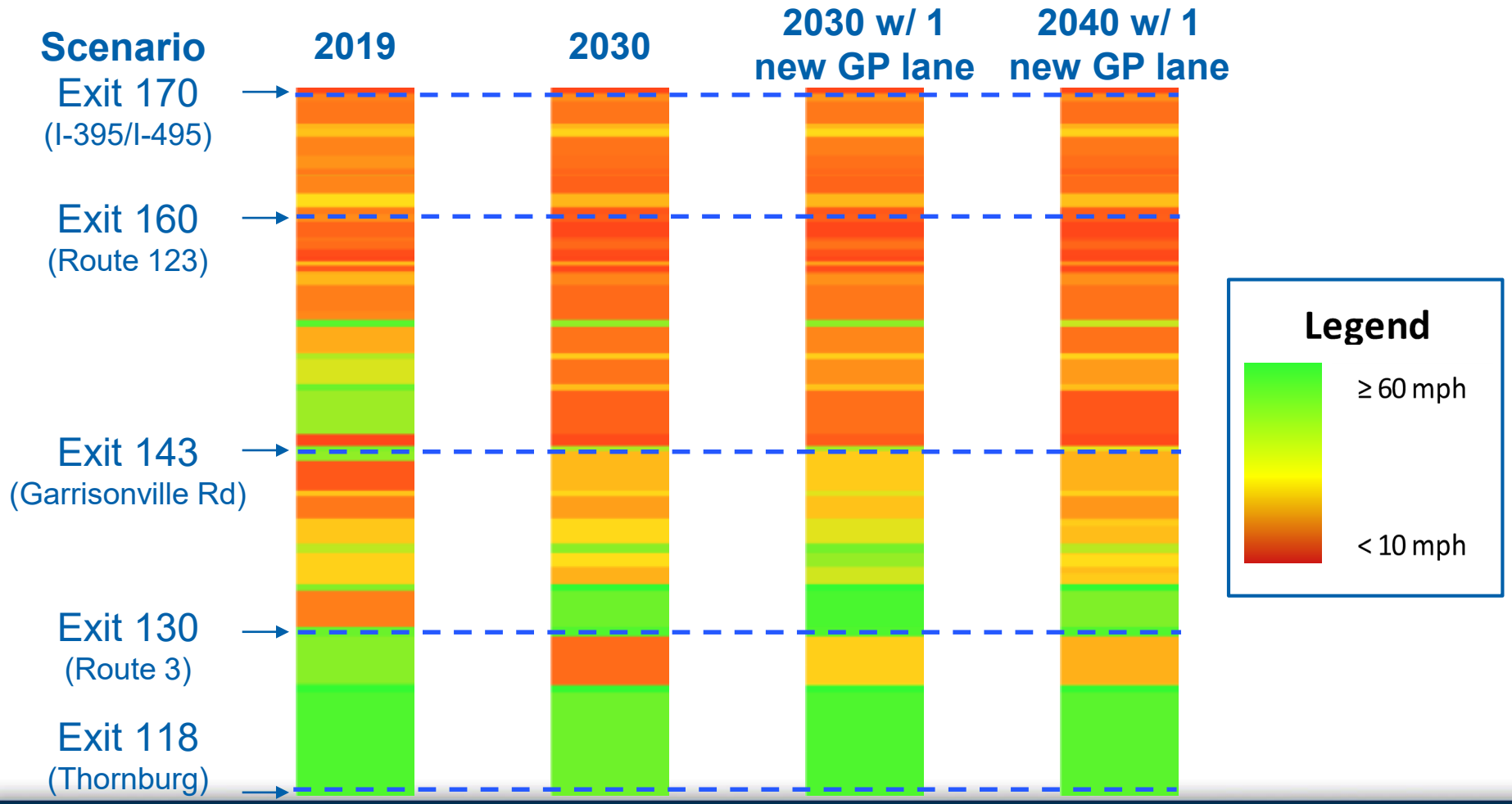
Total Persons Moved = SOV + Intercity Rail (Amtrak), Commuter Rail (VRE), Metrorail, Commuter Bus, Vanpool, Slugging and Carpool

Highway Capacity Improvement Scenario Analyses (Exit 118 to Exit 170)

Analysis Summary

- Adding one or more general purpose lanes in each direction
- Used regional travel demand model for analysis
- Assumed open to traffic in 2030
- Analyzed performance through 2040
- Analyzed speed change along the 52-mile corridor

Peak Period Speed Results after Widening



Persons Moved Summary

One new general purpose lane = 2,200-2,400 people per hour

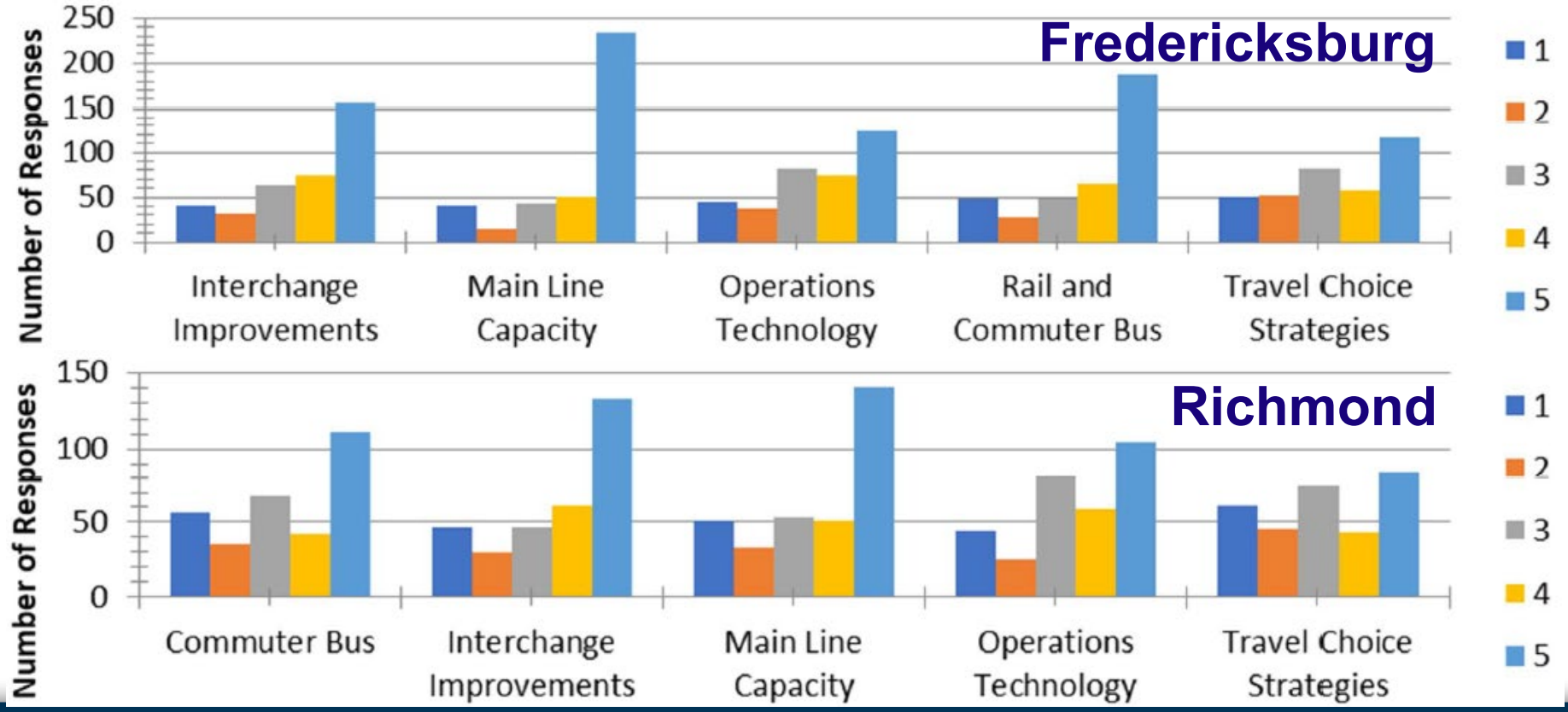
New bus service + 2 new VRE trains = ~2,000 people per hour

New bus service + 4 new VRE trains = ~3,500 people per hour

Multimodal solutions offer opportunities to address peak period conditions at lower cost than large-scale widening of the I-95

October Meetings Public Feedback and Survey Results: Strategy Rating

Participants were asked to rate strategies on a scale of 1 to 5, with 5 being the highest



Suite of Improvements

Focus Areas

- **OPERATIONS ON I-95**
- **PARALLEL FACILITIES** (Routes 1 and 301)
- **MULTIMODAL** (rail, bus, carpool, park and ride)
- **CAPITAL PROJECTS ON I-95**

Data-driven approach incorporating performance measures

GOALS

To provide faster, safer, and more reliable travel along the I-95 corridor

Initial Recommendation

- Operational improvements offer highest ROI and fastest implementation
- $60-$68M cost will require first 3 years of available I-95 dedicated funding
- Proceed with allocation of funding for operational and parallel facilities upgrades

Recommended Operational and Parallel Facilities Improvements

Recommended operational improvements

- Tied to top 25% locations for incident-related delay on I-95 mainline
- Incorporate both freeway and parallel arterial improvements

Over $200M of operations and parallel facilities improvements initially identified

- Prioritized to reflect countermeasures with greatest return on investment
- Will be prioritized on a segment level by district

Total recommended freeway and arterial operations investments: $60 - $68 M

Partial List of Operational Improvements

CCTV Cameras

Detect incidents and provide situational awareness of incidents

Changeable Message Signs

Informs drivers of conditions ahead

Safety Service Patrols

Provide incident scene support and help stranded motorists

Towing Programs

Contract towing services that are activated as incidents are detected

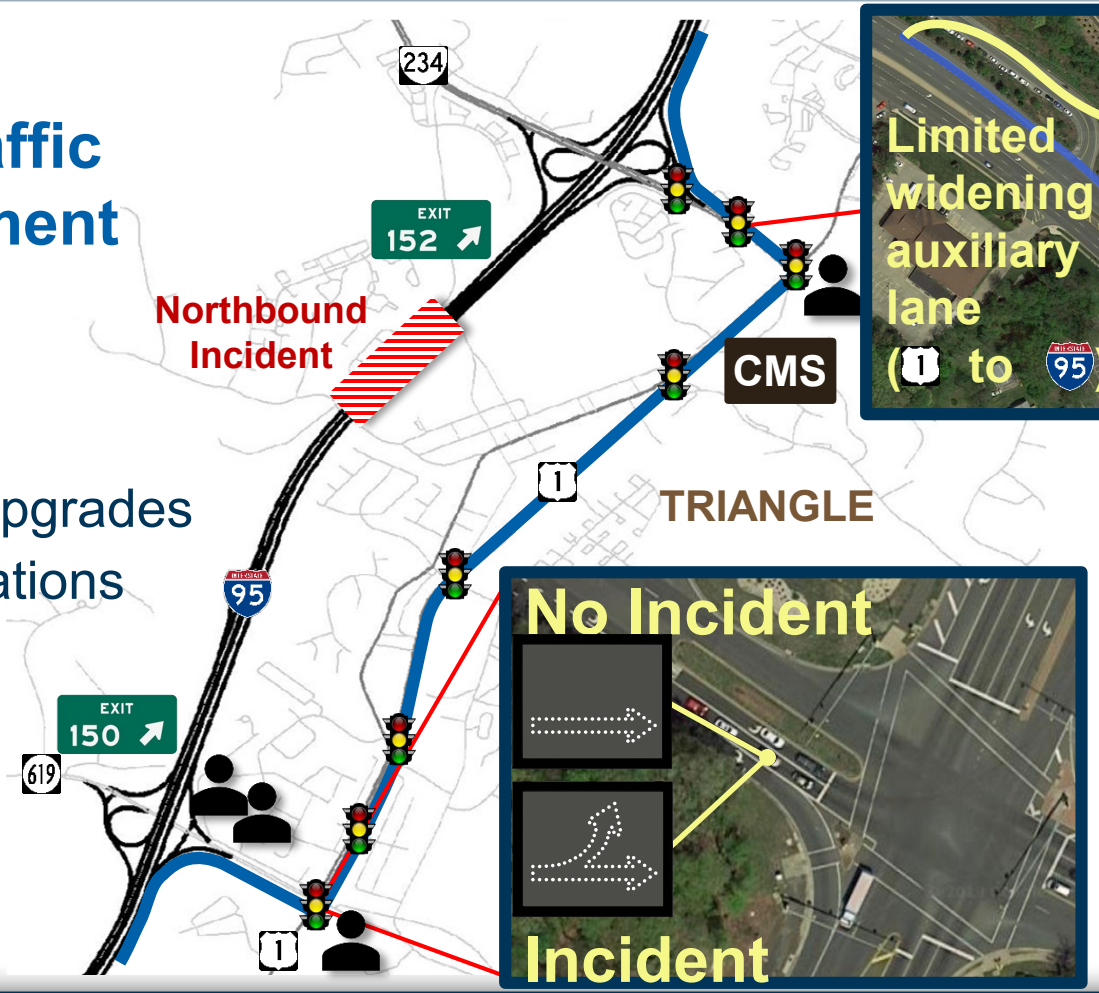
Variable Speed Limits

Adjustable speed limits that change to reduce traffic congestion

Parallel Facilities Improvements

Improvements considered for traffic incident management

- Message signs
- Traffic control personnel
- Communications upgrades
- Traffic signal operations
- Intersection improvements
- Sign improvements



Operational Improvements
Potential Benefits

Towing Program
Incident clearance times reduced by up to 27 minutes per incident

Safety Service Patrols
Incident duration reduced by 17% when SSP is on-site

Variable Speed Limits
Reduce crashes by 8% and increase vehicle throughput by 5%

Ramp Metering
22% reduction in travel times on I-95

Recommended Operational and Parallel Facilities Improvements

Example ROI Analysis

Safety Service Patrols (SSP)

- **Safety**
  - Average percent reduction of secondary crashes is 40%
  - 20% of crashes are secondary crashes
- **Mobility**
  - SSP reduces incident duration by 17%

Recommended Operational and Parallel Facilities Improvements

Safety Service Patrol ROI Metrics

- **Mobility**
  - Incident delay
  - % reduction in incident delay
  - Travel time savings
- **Safety**
  - PDO crashes
  - Injury crashes
  - Fatality crashes
- **Energy & Environment**
  - Travel time savings
  - Fuel consumption
  - Fuel costs
  - Emissions benefits

Safety Service Patrol Expansion

Mobility

number of 2018 incidents on SSP expansion corridors =	6,501	incidents
average AADT on SSP expansion corridors =	70,000	veh / day
average incident reduction due to SSP (21) =	17%	percent incident duration reduction
average 2018 incident duration* =	32	minutes
projected average incident duration reduction due to SSP =	5.4	minutes
average vehicles benefited during incident duration reduction =	264	veh per incident
average number of vehicles benefited per year =	1,719,153	veh / year
travel time savings due to reduced incident duration =	427	veh hours / day
percent distribution of personal/business vehicles =	90%	
percent distribution of freight vehicles =	10%	
average vehicle occupancy (11) =	1.67	persons / vehicle
passenger hourly value of delay time (13) =	$ 17.81	/ person / hour
commercial hourly hourly value of delay time (13) =	$ 53.69	/ person / hour
average annual benefit of personal/business travel =	$ 4,172,393	
average annual benefit of freight travel =	$ 836,866	
Annual Mobility Benefit (passenger + commercial) =	$ 5,009,258	

Safety

Total 2018 crashes on SSP expansion corridors =	1,393	crashes
average percent VA crashes resulting in fatality =	0.3%	
average percent VA crashes resulting in injury =	33.5%	
average percent VA crashes resulting in PDO/non-injury =	76.7%	non-injury crashes
average expected percentage of incidents that are secondary crashes (8) =	20%	percent
average reduction of secondary crashes due to reduced incident duration (8) =	40%	percent
estimated annual number of secondary crashes resulting in fatality along SSP expansion routes =	1.0	fatality crashes
estimated annual number of secondary crashes resulting in injury along SSP expansion routes =	93	injury crashes
estimated annual number of secondary crashes resulting in non-injury / PDO along SSP expansion routes =	214	non-injury/PDO crashes
estimated reduced annual number of secondary fatality crashes due to SSP expansion =	0.58	fatality crashes
estimated reduced annual average number of secondary injury crashes due to SSP expansion =	56.0	injury crashes
estimated reduced annual average number of secondary PDO/non-injury crashes due to SSP expansion =	128.2	non-injury crashes
Average cost of a fatal collision per person (9) =	$ 4,008,900	
Average cost of a injury collision per person (9) =	$ 124,525	
Average property damage only crash (9) =	$ 7,400	
Annual Safety Benefit =	$ 10,254,122	

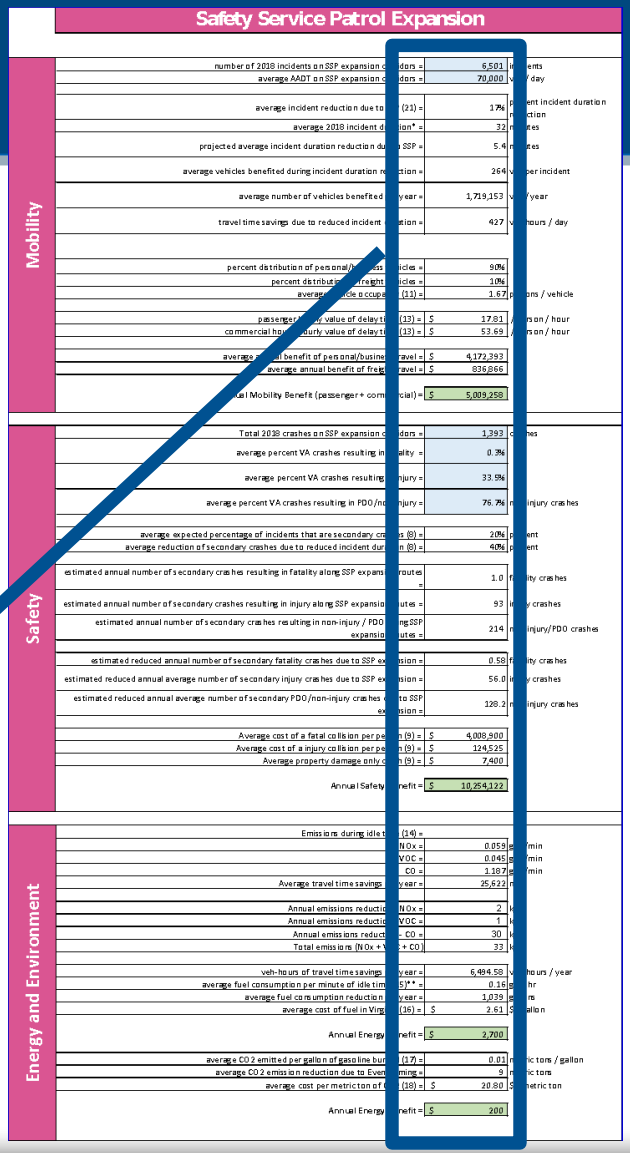
Energy and Environment

Emissions during idle time (14) =		
NOx =	0.059	gms/min
VOC =	0.045	gms/min
CO =	1.187	gms/min
Average travel time savings per year =	25,822	min
Annual emissions reduction - NOx =	2	kg
Annual emissions reduction - VOC =	1	kg
Annual emissions reduction - CO =	30	kg
Total emissions (NOx + VOC + CO)	33	kg
veh-hours of travel time savings per year =	6,494.58	veh-hours / year
average fuel consumption per minute of idle time (15)** =	0.16	gal / hr
average fuel consumption reduction per year =	1,039	gallons
average cost of fuel in Virginia (16) =	$ 2.61	$ / gallon
Annual Energy Benefit =	$ 2,700	
average CO 2 emitted per gallon of gasoline burned (17) =	0.01	metric tons / gallon
average CO 2 emission reduction due to Event Timing =	9	metric tons
average cost per metric ton of CO 2 (18) =	$ 20.80	$ / metric ton
Annual Energy Benefit =	$ 200	

Recommended Operational and Parallel Facilities Improvements

Safety Service Patrol ROI

Capital Cost =	**$3.3-3.6 M**
O&M cost over 10 yrs. =	**$25 M**
Benefit over 10 yrs. =	**$80.1 M**
ROI =	**3.1**



Recommended Operational Improvements – ROI Summary

Proposed Operational Improvement	Implementation Cost	O&M Cost (10 Years)	Benefit (10 Years)	ROI (10 Years)
CCTV Cameras	$14.7M - $16.2M	$ 4,608,000	$ 134,582,891	7.0
Changeable Message Signs	$3.0M - $3.3M	$ 1,890,000	$ 18,645,613	3.9
Safety Service Patrols	$3.9M - $4.3M	$ 27,000,000	$ 88,226,236	2.9
TRIP Towing Program	$2.1M - $2.3M	$ 15,300,000	$ 84,452,327	4.9
Towing Program	$1.1M - $1.3M	$ 9,820,000	$ 141,152,049	12.9
Variable Speed Limits	$2.1M - $2.3M	$ 15,570,000	$ 117,483,669	3.9
Ramp Metering	$5.4M - $5.9M	$ 2,070,000	$ 71,734,627	9.7
Geofenced Emergency Notifications	$0.1M - $0.2M	$ 1,000,000	$ 1,381,000	1.3
Advanced Work Zone Technology	$0.9M - $1.0M	$ 4,050,000	$ 19,205,243	3.9
Regional Multimodal Mobility Project (RM3P)	N/A	$ 9,630,000	$ 28,211,249	2.9
Misc. Low Cost Operations Improvements	$4.1M - $4.5M	$ 14,220,000	$ 98,309,970	5.4

Recommended Parallel Facilities Improvements – ROI Summary

Proposed Operational Improvement	Implementation Cost	O&M Cost (10 Years)	Benefit (10 Years)	ROI (10 Years)
CCTV Cameras - Arterials	$3.2M - $3.5M	$ 890,000	$ 28,640,085	6.9
ATSPM	$11.0M - $11.5M	$ 2,700,000	$ 65,064,066	4.8
Blank-Out Signs	$0.3 - $0.5M	$ 71,000	$ 2,709,108	7.0

Multimodal Improvements

Improvements considered

Commute!VA

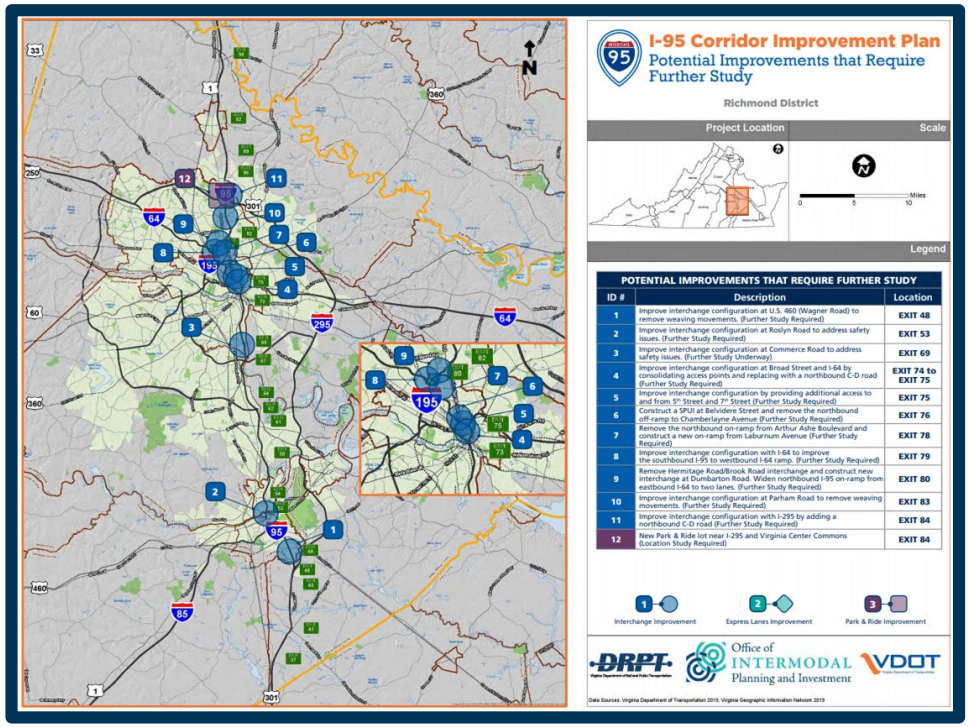
- Long Bridge
- Intercity passenger rail
- Commuter rail
- Commuter bus
- Park & Ride lots
- TDM strategies
  - Carpooling
  - Vanpooling
  - Slugging

Recommendations
Major Improvements - Highlights

- **Richmond District**
  - Exit 51 – Construct flyover from northbound I-95 to southbound I-85
  - Exit 78 – Widen southbound I-95 off-ramp at Arthur Ashe Boulevard

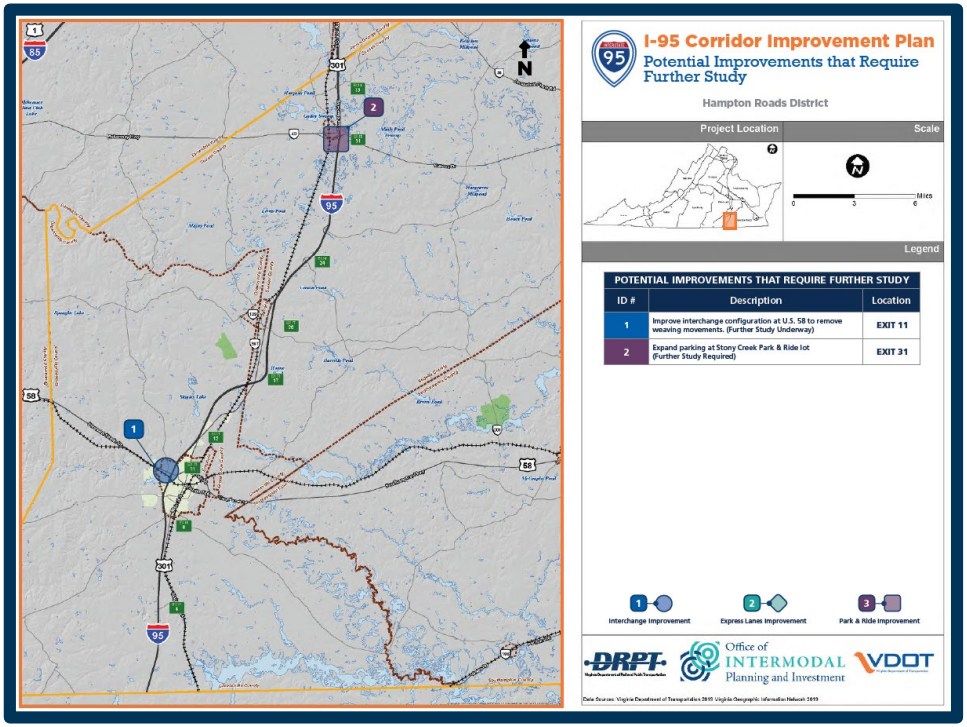
Recommendations
Areas for Further Study - Highlights

- **Richmond District**
  - Exit 74 to 75 – Improve interchange at Broad Street and I-64 by consolidating access points and replacing with a northbound C-D road
  - Exit 76 – Construct a SPUI at Belvidere Street and remove the northbound off-ramp to Chamberlayne Avenue



Recommendations
Areas for Further Study - Highlights

- **Hampton Roads District**
  - Exit 11 – Improve interchange configuration at US 58 to remove weaving movements



Corridor-wide Improvements Planning Level Cost Estimates

Estimated FY20 Capital Cost Ranges

- Freeway operations upgrades: $48 - $53 M
- Arterial operations upgrades: $12 - $15 M
- Multimodal improvements: $335 - $376 M
- Highway capital improvements: $1.3 - $1.8 B

TOTAL: $1.7 - $2.2 B

Potential Capital Improvements

- 54 projects (highway, rail, bus, park & ride) with estimated cost between $1.7 - $2.2B
- 35 locations requiring additional study
- Challenge: Needs far exceed available annual revenues

Potential Sources of Revenue
Dedicated Interstate Funding Estimates

By FY2022 -

- **~$40M per year**: for the I-95 corridor at the discretion of the CTB
- **~$44M per year**: At the discretion of the CTB for any interstate

Based on % of Truck (FHWA Class 6 and higher) Vehicle Miles Traveled on each interstate

Potential Sources of Revenue
Other Sources

- SMART SCALE
- Regional funding – NVTA
- Regional Surface Transportation Block Grant Program (Northern Virginia, Fredericksburg, Richmond and Tri-Cities MPO regions)
- Innovative Transportation Technology Fund
- I-395 Commuter Choice
- Rail and transit funding programs

Recommendations

- **Complete evaluation of I-64 corridor**
- **Identify operational improvements for other Interstate corridors**
- **Establish CTB policy on allocation of dedicated interstate revenues**
- **Evaluate all potential projects to determine best allocation of dedicated and discretionary Interstate funds**
- **Conduct further study on items identified**
  - Bi-directional HOT Lanes, Beltway HOT Lanes expansion, multiple interchange improvements

Status Update and Next Steps

- Corridor-wide operations and arterial upgrades approved in January 2020
- Interim I-95 Corridor Improvement Plan adopted by CTB in January 2020
- Prioritize remaining projects after completion of the I-64 corridor plan
- Finalize I-95 Corridor Improvement Plan in summer 2020

Transforming Rail in Virginia and I-95

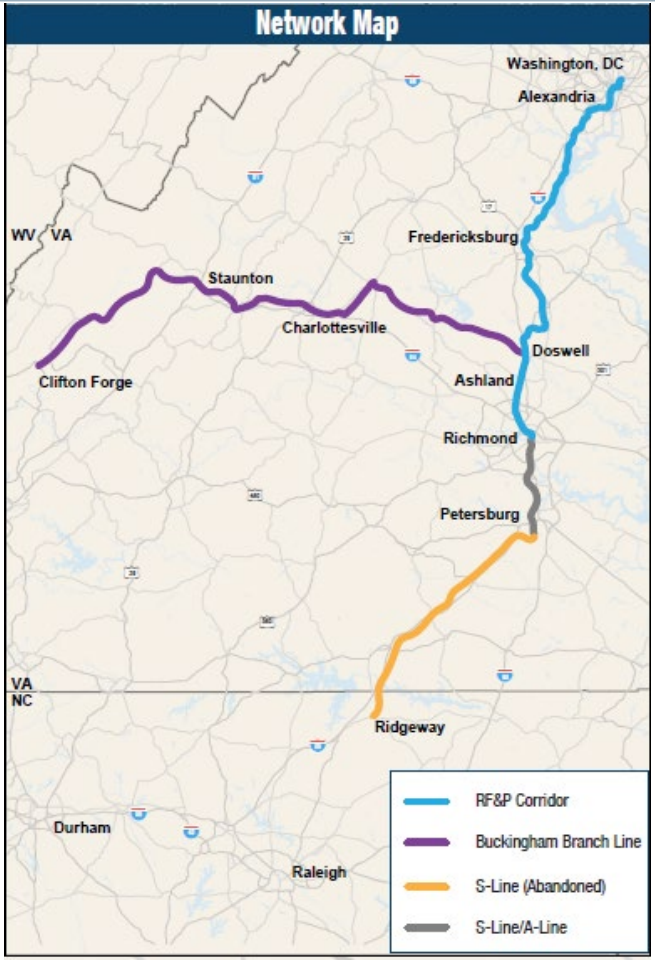
- **In December 2019, a landmark deal with CSX was announced that will have major implications to the I-95 corridor in the near future**
  - Rail recommendations identified in the I-95 plan move closer to becoming a reality
  - Rail improvements will impact performance of the I-95 highway corridor

Transforming Rail in Virginia

- **$3.7B landmark deal with CSX including acquisition of:**
  - 350 miles of right-of-way
  - 250 miles of track
  - Passenger rights
- **Build-out of infrastructure in two phases**
- **Completion of phases will result in additional VRE / Amtrak service**
- **Path forward to full separation of freight and passenger service in future**
- **Preservation of future rail corridors**
- **Funding for program has been identified and is in the process of being secured through agreements with funding partners**

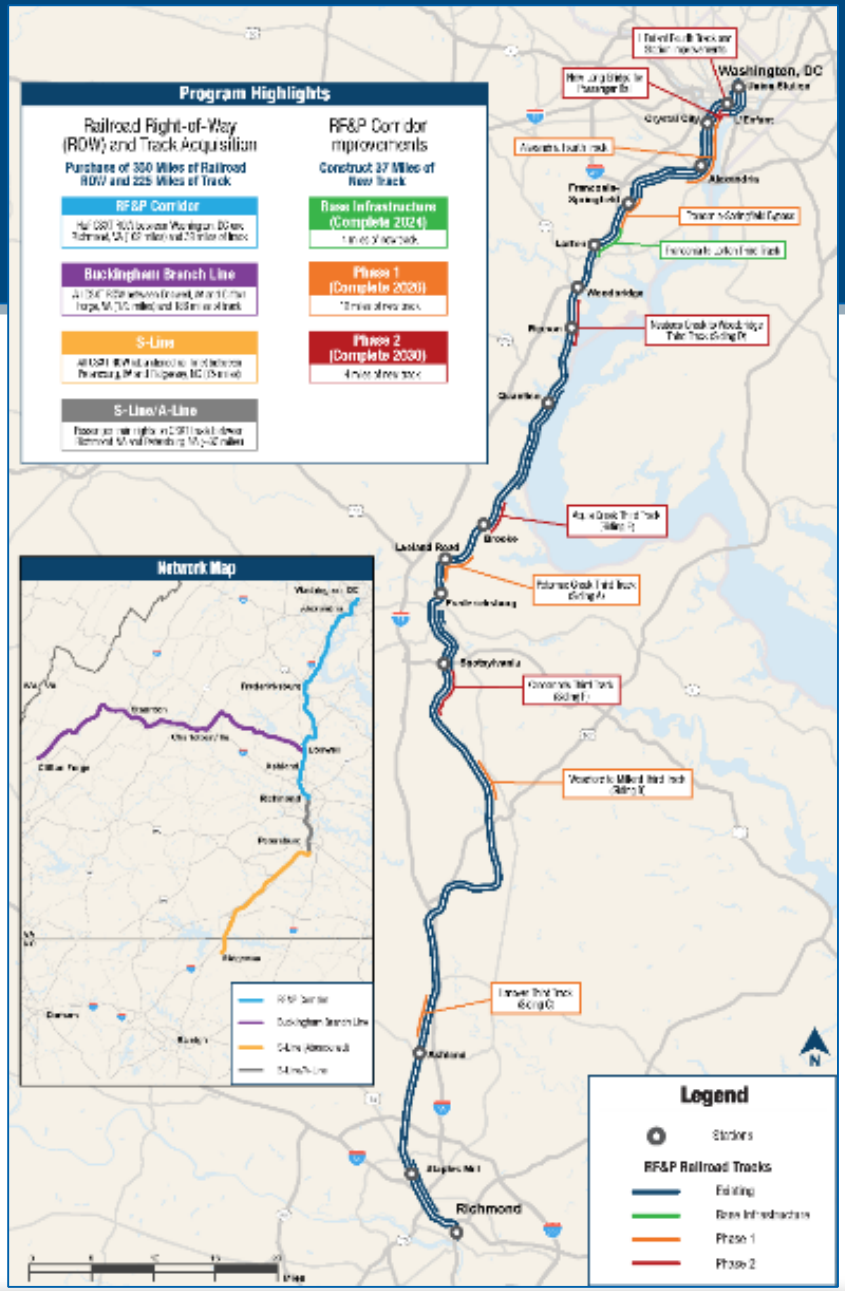
Acquisition

- 100+ miles of right of way and 39 miles of track from DC to Richmond along the “RF&P”
- 30 miles of passenger rights from Richmond to Petersburg
- 170+ miles of track on the Buckingham Branch from Doswell to Clifton Forge
- 75 miles of abandoned track from Petersburg to Ridgeway, NC



Infrastructure

- **Construction of Long Bridge and 4th track in DC**
- **4th track in Arlington and Alexandria**
- **All passenger trains in VA travel through this corridor**
- **3rd track from Franconia to Lorton**
- **Franconia-Springfield Bypass**
- **Sidings at the following locations**
  - Potomac Creek
  - Woodford - Milford
  - Hanover
  - Neabsco Creek - Woodbridge
  - Aquia Creek
  - Crossroads

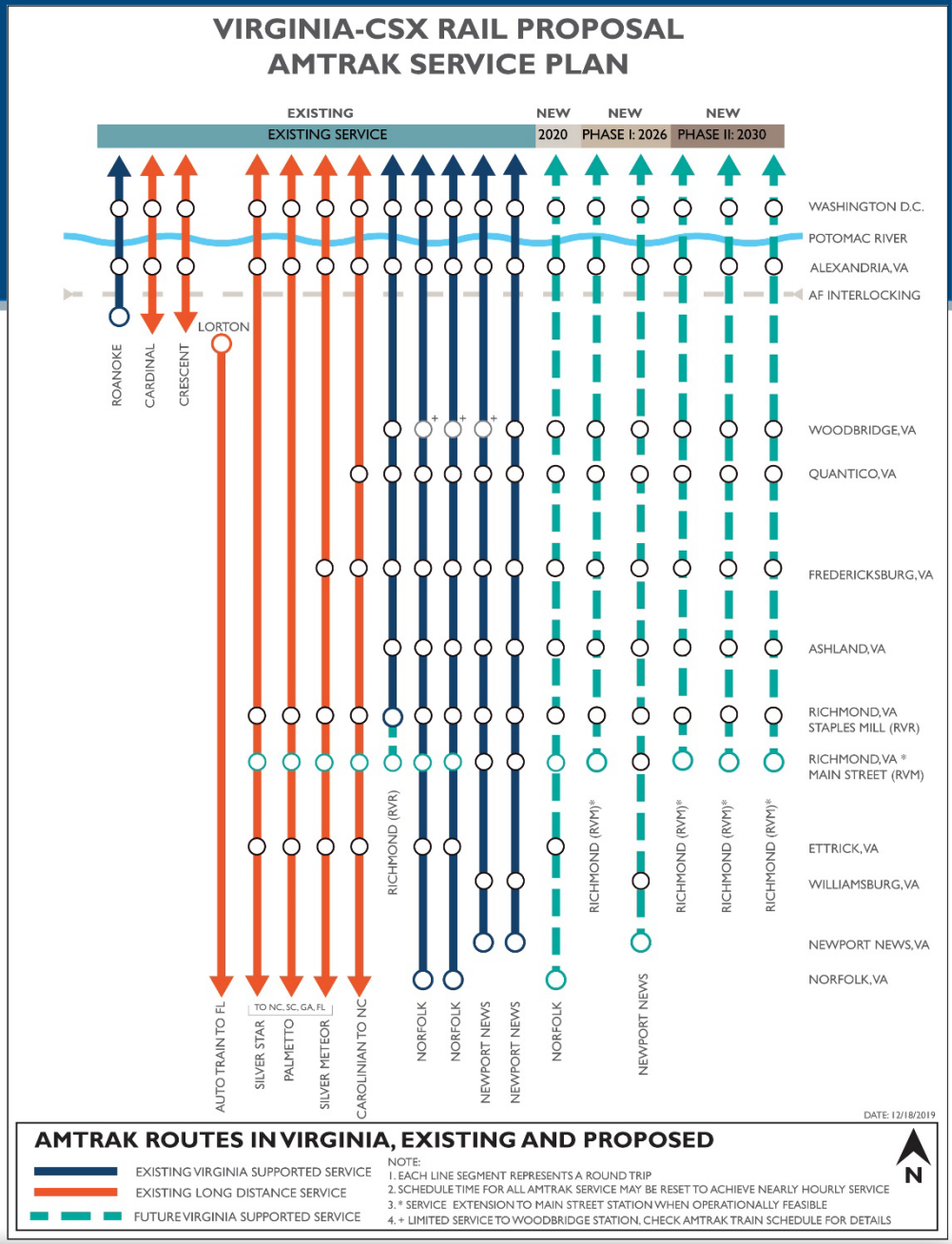


Service

- Provides Virginia with control and guaranteed VRE / Amtrak service
- Double state-supported Amtrak, with nearly hourly service from DC to Richmond
- Additional train to Norfolk with mid-day arrival and departure
- New round-trip train to Newport News
- Increase VRE service by 75% along the Fredericksburg line + new late night & weekend service offering
- Allows future ability to increase trains on the VRE Manassas Line

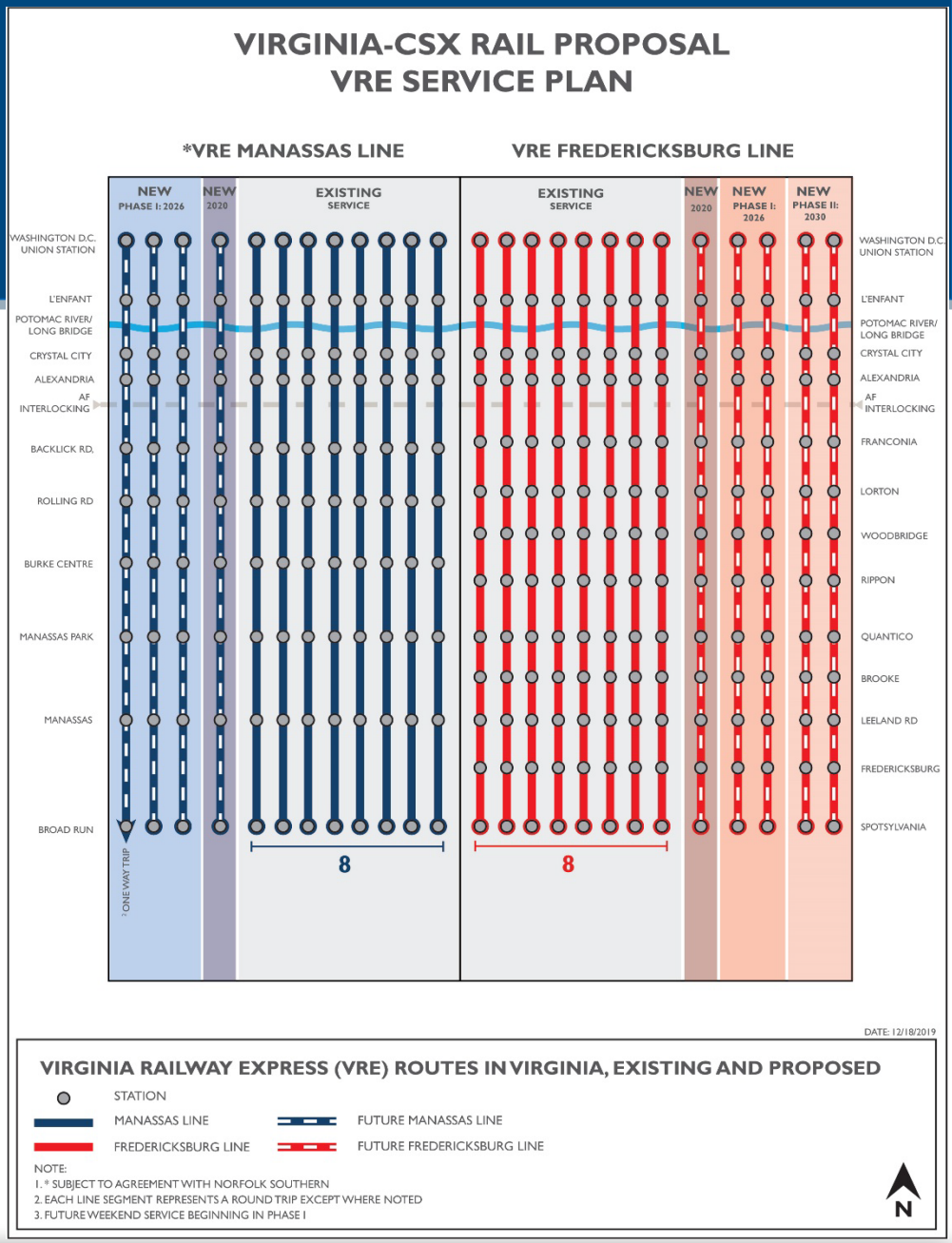
Amtrak Service Plan

- **6 additional round-trip trains connecting Virginia to the northeast by 2030**



VRE Service Plan

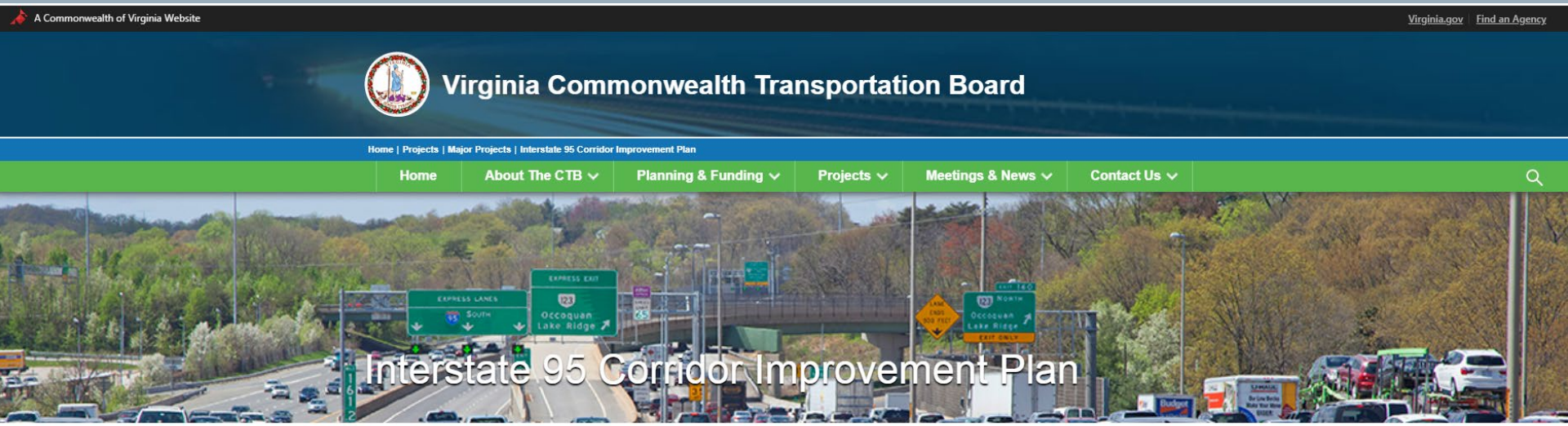
- 5 additional round-trip VRE trains on the Fredericksburg Line by 2030
- Includes late-night & weekend service



Next Steps

- **Finalize definitive agreements with CSX**
  - Conduct land survey and title work necessary for agreements
  - Maintenance and operation agreement
  - Transition agreement
- **Develop service agreements with Amtrak and VRE**
- **Refine financial plan and secure commitments from other state, Federal and local funding partners**
- **Continue working with CSX and other stakeholders to advance rail projects in the corridor**
  - Alexandria / Arlington 4th track design
  - Long Bridge preliminary engineering

www.VA95corridor.org



What's Being Done

The Commonwealth Transportation Board (CTB), supported by the Office of Intermodal Planning and Investment (OIPI), the Virginia Department of Transportation (VDOT), and the Department of Rail and Public Transportation (DRPT), will study Interstate 95 (I-95) to initiate a data-driven study to develop the I-95 Corridor Plan which will (i) identify key problem areas along the corridor, and (ii) identify potential solutions and areas for additional review and study.

As directed in **Senate Joint Resolution 276** and **House Joint Resolution 581** during the 2019 General Assembly, the study team will identify targeted improvements and incident management strategies for the corridor.

Interim I-95 Corridor Improvement Plan

Study Duration: April-December 2019

Localities: Counties of Caroline, Chesterfield, Fairfax, Greensville, Hanover, Henrico, Prince George, Prince William, Spotsylvania, Stafford, Sussex and cities of Alexandria, Emporia, Fredericksburg, Colonial Heights, Petersburg and Richmond

Districts: Northern Virginia, Fredericksburg, Richmond and Hampton Roads