



COMMONWEALTH of VIRGINIA

Commonwealth Transportation Board

Shannon Valentine
Chairperson

1401 East Broad Street
Richmond, Virginia 23219

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COMMONWEALTH TRANSPORTATION BOARD WORKSHOP AGENDA

The Virginian Hotel
Eleanor Rose Madison Room
712 Church Street
Lynchburg, Virginia 24504.

July 16, 2019

10:00 a.m.

1. Virginia Breeze Expansion
Jennifer DeBruhl, Virginia Department of Rail and Public Transportation
Grant Sparks, Virginia Department of Rail and Public Transportation
2. WMATA Annual Reporting Requirements
Jennifer Mitchell, Virginia Department of Rail and Public Transportation
3. Roadway Lighting Contract
Garrett Moore, Virginia Department of Transportation
4. I-95 Corridor
Nick Donohue, Deputy Secretary of Transportation
5. Highway Safety Improvement Program Policy Recommendations
Margit Ray, Office of Intermodal Planning and Investment
6. Virginia Strategic Highway Safety Plan
Mark Cole, Virginia Department of Transportation
7. SmartScale
Chad Tucker, Office of Intermodal Planning and Investment
8. Director's Items
Jennifer Mitchell, Virginia Department of Rail and Public Transportation
9. Commissioner's Items
Stephen Brich, Virginia Department of Transportation
10. Secretary's Items
Shannon Valentine, Secretary of Transportation

Virginia Breeze - Intercity Bus Expansion

July 16, 2019

Commonwealth Transportation Board

Jennifer DeBruhl, Chief of Public Transportation
Grant Sparks, Manager of Transit Planning and
Corridor Development



Virginia Department of Rail and Public Transportation

What is Intercity Bus?

- Available to the general public
- Regularly scheduled fixed-route service
- Operates with limited stops between two or more urban areas not in close proximity
- Capable of carrying baggage
- Schedules coordinate with longer-route service, not commuter service
- Meaningful connections to national intercity bus network

FTA Requirement

- States must assess unmet needs for intercity bus service
 - » *2013 assessment identified significant need across the Commonwealth*

Goals of Intercity Bus Service

- **Connect underserved communities to interregional bus, rail, and air travel**
 - » *Households without cars*
 - » *Students*
 - » *Elderly/disabled*
- **Fulfill the federal requirements associated with assessing and meeting rural transportation needs – established in ISTEA, minimum 15% set aside since SAFETEA-LU**
- **Provide travel options in corridors where alternatives to the personal vehicle are limited or do not exist**
- **Supplement service of private providers – fill gaps and make connections**

The Virginia Breeze

- **First Virginia Breeze service launched December 1, 2017**
 - » *Blacksburg to Washington D.C.*
- **7 days a week**
- **Approx. 50 seats with luggage compartment, Wifi, in-seat power outlets, and a restroom**
- **Fares range from \$15 - \$50**
- **1st state to partner with MegaBus for interline ticketing**



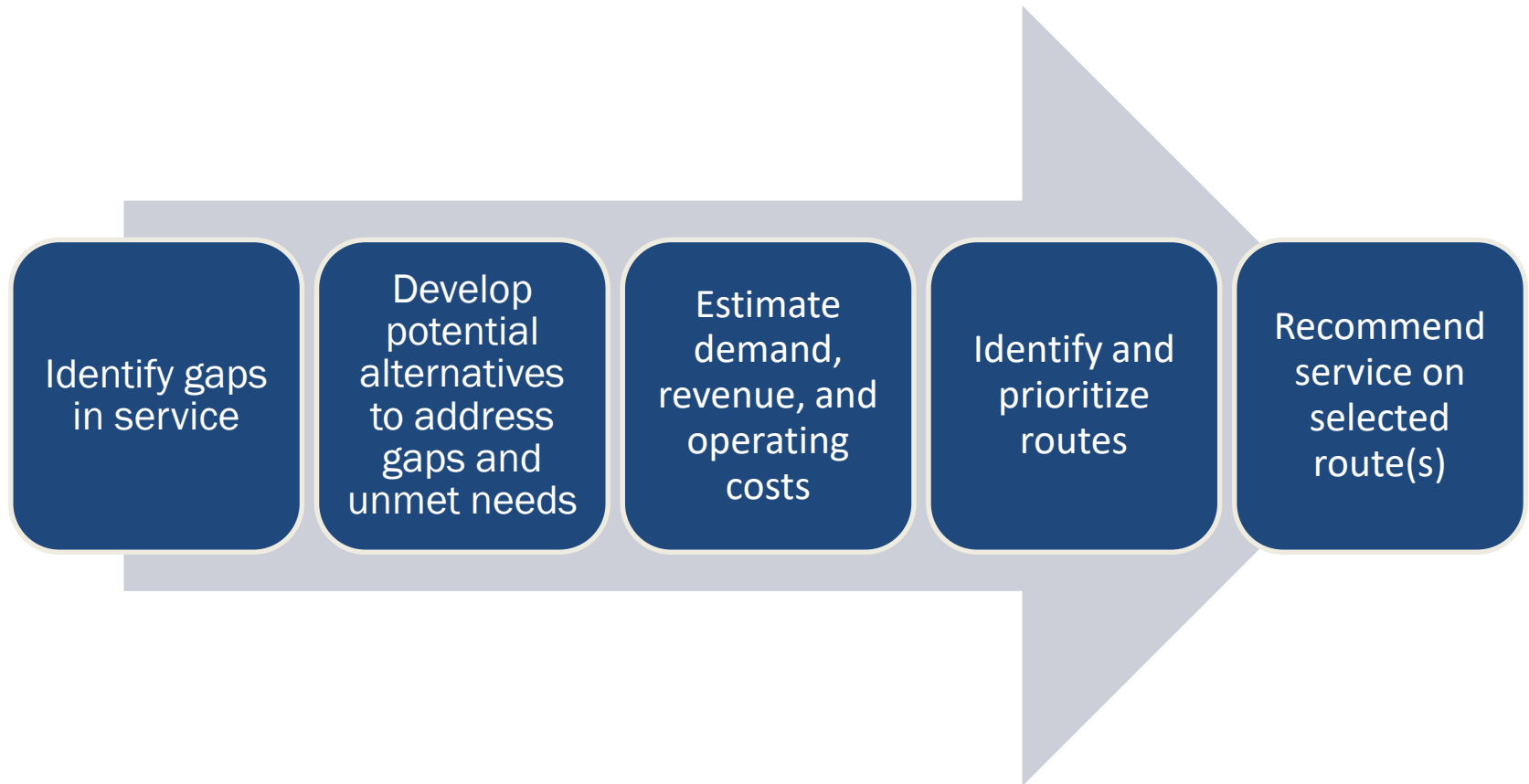
Performance and Cost



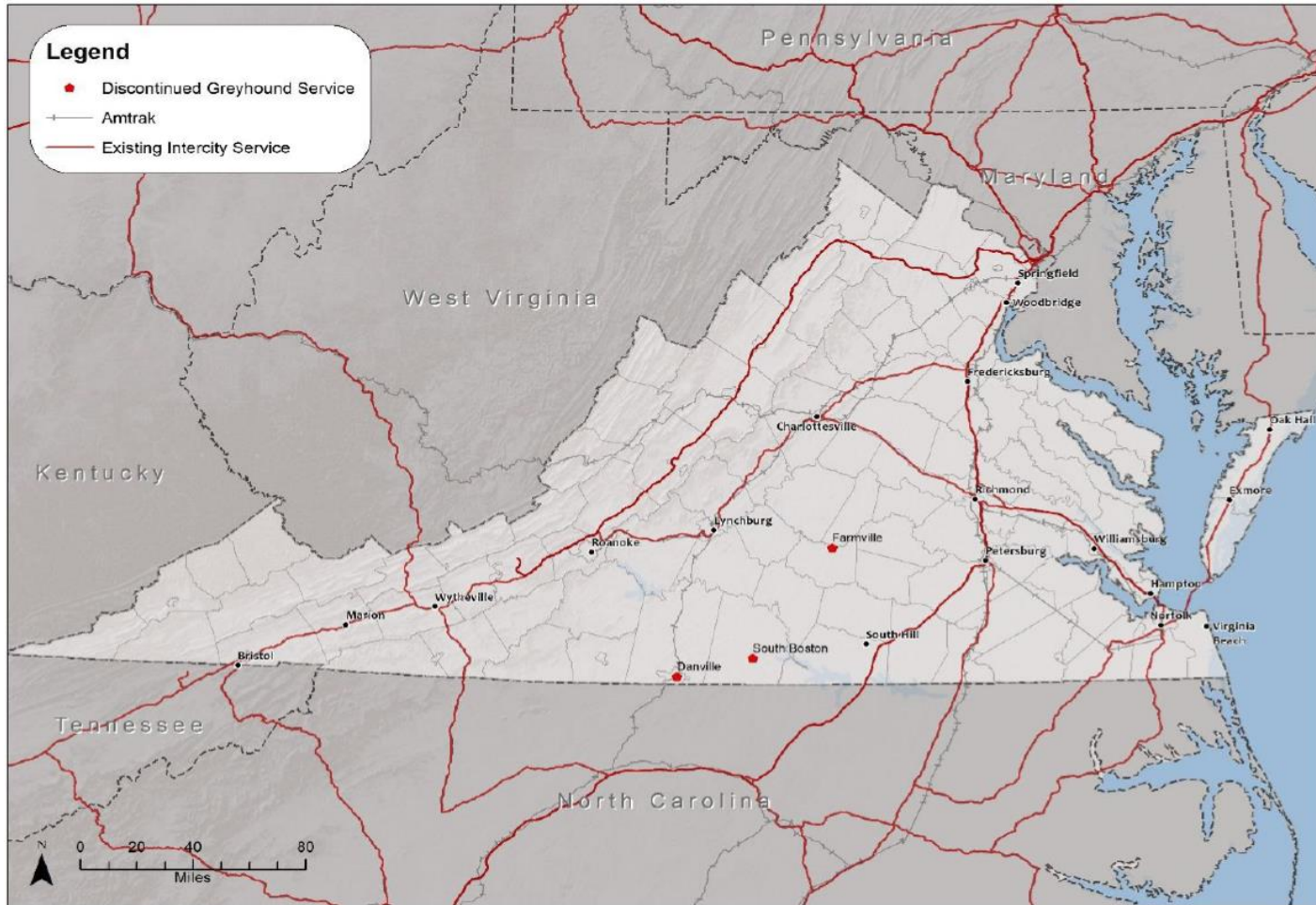
- **Projected Annual Ridership**
 - » 7,125
- **Actual Annual Ridership**
 - » 19,300 (+271% of estimate)
- **Farebox Recovery Rate**
 - » 81%
- **Annual Cost**
 - » \$1M
- **Annual Farebox Revenue**
 - » \$800K
- **Annual Net Cost**
 - » \$200K*

*Funded through FTA 5311(f) funds

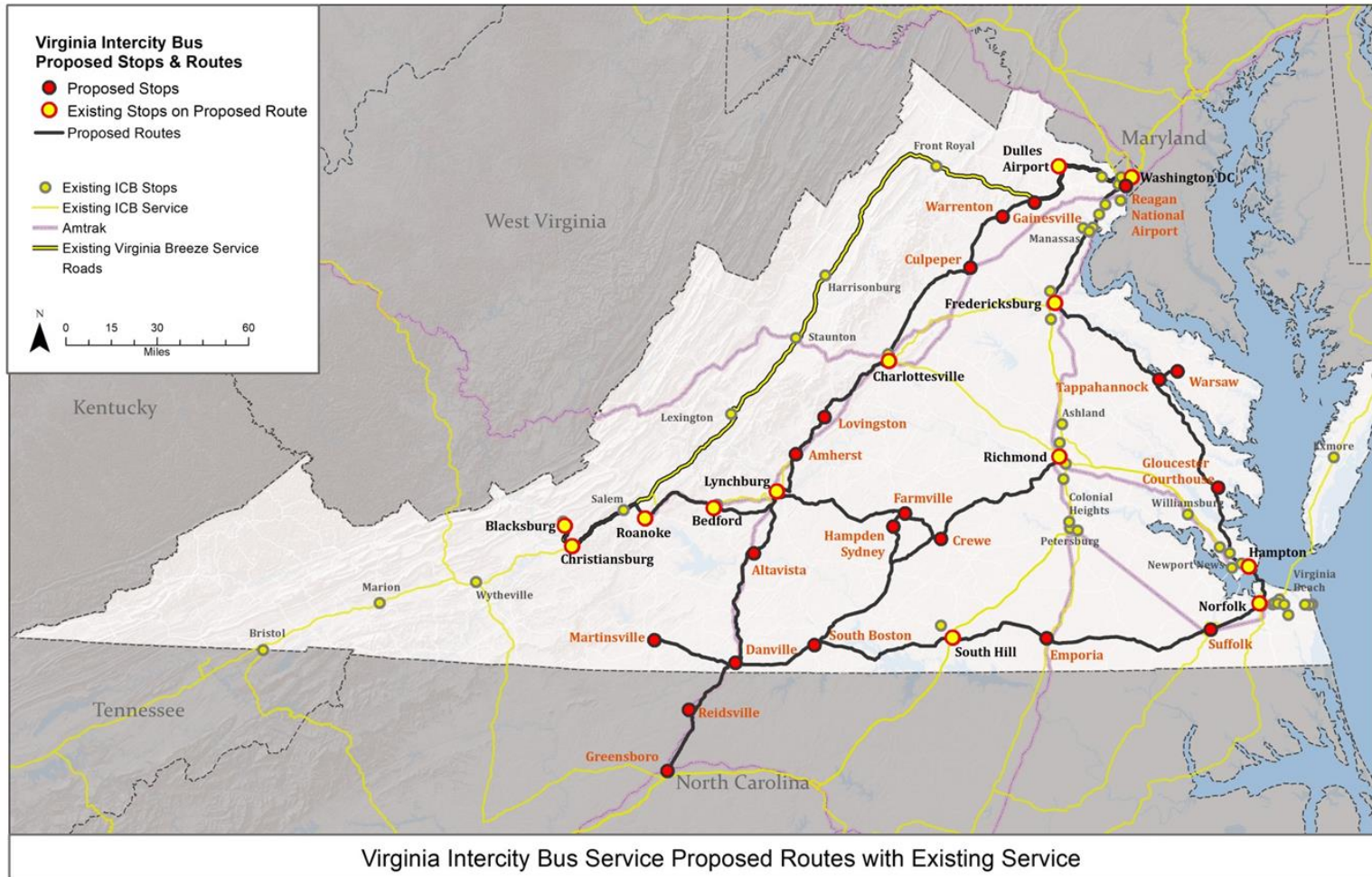
Service Expansion Study



Existing Intercity Bus Service



Potential Expansion Corridors



Prioritization Criteria

- Degree to which each route provides access to underserved populations
- Potential ridership
- Anticipated cost of operations
- Projected Fare Revenue
- Degree to which proposed service supplements existing service and fills service gaps

Anticipated Ridership and Cost

- **Danville to Washington D.C.**
 - » *Projected Annual Ridership: 10,050*
 - » *Estimated Annual Cost: \$901,360*
 - » *Estimated Annual Revenue: \$364,001*
 - » *Estimated Annual Net Cost: \$537,358*
- **Martinsville to Richmond**
 - » *Projected Annual Ridership: 5,500*
 - » *Estimated Annual Cost: \$606,083*
 - » *Estimated Annual Revenue: \$178,596*
 - » *Estimated Annual Net Cost: \$427,487*
- **Net cost will be covered by FTA 5311(f) funds**



Next Steps

- Transportation provider procurement
- New branding
- New mobile app and ticketing synchronization
- Final stop selection
- Launch service in Spring/Summer 2020 (tentative)



Virginia Breeze - Intercity Bus Expansion

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Corridor Development



Virginia Department of Rail and Public Transportation

WMATA Annual Reporting Requirements

July 16, 2019

Commonwealth Transportation Board

Jennifer Mitchell, Director



WMATA

- **Established by interstate compact – identical legislation passed by VA, MD, and DC, ratified by Congress**
- **Compact members – responsible for funding**
 - » *Virginia Local Jurisdictions – Arlington and Fairfax Counties, Cities of Alexandria, Fairfax, and Falls Church (Loudoun to be added upon completion of Silver Line)*
 - » *Maryland*
 - » *District of Columbia*
- **2017 LaHood Study – Lead by Virginia, confirmed need for additional dedicated capital funding to address state of good repair needs (\$500M year)**
- **2018 Legislation – Dedicated Capital Funding (proportional share)**
 - » *Virginia adopted legislation first and established measures for reporting and accountability as a condition for funding*

Capital Fund Agreement – Dedicated Funding

- **Agreement between DRPT and WMATA**
- **Executed May 1, 2019**
 - » *Effective immediately*
 - » *Automatically renews each July 1 unless either party gives 90 day notice of request to amend*
 - » *Agreement may be terminated by either party if dispute resolution process fails*
- **Funding subject to annual appropriation and allocation**
- **Commonwealth does not guarantee the debt of WMATA or any obligation of WMATA by the Agreement**

Capital Fund Agreement - WMATA

Responsibilities

- **WMATA shall apply the Commonwealth's contribution under the Agreement to items identified in the approved CIP**
- **WMATA shall provide information to NVTC as required by Sections 33.2-3402 & 33.2-3403 of the Code of Virginia**
- **WMATA shall provide information to the CTB to meet its obligations under Section 33.2-3400 et seq. of the Code of Virginia and the CTB Policy approved on 9/18/18**
- **Within 45 days of the end of every quarter WMATA shall submit to the Commonwealth a report on WMATA financials of the preceding quarter in the same form as submitted to the WMATA Board of Directors**

WMATA Reporting Requirements - CTB

CTB Resolution on Policy and Guidelines for Implementation of Governance and Funding Reforms for the Washington Metropolitan Area Transit Authority (WMATA) – Approved September 18, 2018

- **WMATA shall submit the documents required to demonstrate compliance to DRPT by the deadlines specified. DRPT will analyze the information received from WMATA and present to the CTB, in September of each year (beginning in 2019), a recommendation on enforcement actions, if any, that are required to be taken by this policy.**
 - » **Received from WMATA on June 28, under review by DRPT and OAG**

WMATA Board Governance

Legislative Requirement:

- Board shall withhold 20% of dedicated state funds for WMATA for non-compliance (\$31.8M in FY20)

CTB Guidelines:

- Alternates shall not participate in Executive Session of Full Board or Executive Session of Committees unless they are serving in absence of a primary member
- Alternates may not serve as Chair of a Committee
- In Committee meetings, alternates may be invited to make presentations or participate in discussion

Status:

- **WMATA Board approved bylaw changes on June 28, 2018**
- **Certification from the WMATA Board Secretary provided on June 28, 2019**

3% Cap on Growth in Operating Assistance

Legislative Requirement:

- Board shall withhold 35% of dedicated state funds for WMATA (\$55.7M in FY20)
- Operating costs related to the following are excluded from this calculation:
 - » *Any service, equipment, or facility that is required by any applicable law, rule or regulation*
 - » *Any capital project approved by the WMATA Board before or after effective date*
 - » *Any payment/obligation resulting from a legal dispute or proceeding*

CTB Guidelines:

- Provided additional clarity on definitions and calculations

Status:

- **WMATA Board approved FY20 budget on March 28, 2019**
- **Certification provided on June 28, 2019**

WMATA Strategic Plan

Legislative Requirements

- Board shall withhold 20% of dedicated state funding for WMATA for non-compliance (\$31.8M in FY20)
- WMATA must adopt or update within the preceding 36 months a strategic plan and hold a public hearing on the strategic plan in Northern Virginia
- First strategic plan must address the key recommendations in the report submitted pursuant to Item 436 R of Chapter 836 of the Acts of Assembly of 2017

CTB Guidelines

- First strategic plan shall address recommendations in LaHood report
- Every 3 years thereafter WMATA must adopt or update a strategic plan

Status:

- **Strategic Plan was approved by WMATA Board on March 28, 2019**
- **Certification provided on June 28, 2019**



WMATA Capital Improvement Program

Legislative Requirements

- Board shall withhold 20% of dedicated state funding for WMATA for non-compliance (\$31.8M in FY20)
- WMATA must adopt by July 1, 2019 a capital improvement program that covers a 6-year period, and hold a public hearing in Northern Virginia
- Annually thereafter WMATA must update the 6-year program, similar to CTB policy

CTB Guidelines

- Beginning July 1, 2019, WMATA must adopt a detailed capital improvement program covering the current fiscal year and the next five fiscal years; and have held at least one public hearing on such capital improvement program in NVTC jurisdiction

Status:

- **CIP was adopted by the WMATA Board on March 28, 2019**
- **Certification provided on June 28, 2019**

WMATA Reporting Requirements - NVTC

Section 33.2-3402 of the Code of Virginia, pursuant to Chapter 854 of the 2018 Virginia Acts of Assembly

- Each year the Northern Virginia Transportation Commission (NVTC) shall request certain documents and reports from WMATA to confirm the benefits of the WMATA system to persons living, traveling, commuting, and working in the localities that the NVTC comprises. Such documents and reports shall include:
 - » *WMATA's Annual Capital Budget*
 - » *WMATA's Annual Independent Financial Audit*
 - » *WMATA's National Transit Database Annual Profile*
 - » *Single Audit Reports issued in accordance with the Uniform Administrative Requirements, Cost Principals, and Audit Requirements for Federal Awards (2 C.F.R. Part 200).*
- NVTC shall provide annual certification to the Comptroller that such documents and reports have been received.
 - » **NVTC provided the required certification to the Comptroller on June 27, 2019**

Passenger Rail Investment and Improvement Act of 2008 (PRIIA)

- **PRIIA was passed by Congress and authorized \$1.5 billion over ten years to WMATA for capital and safety improvements.**
- **\$150 million a year in federal capital funding, with a \$50 million annual match from Virginia, DC, and Maryland for a total of \$300 million per year.**
- **In Virginia, the Commonwealth funds the \$50 million match through the CPR Bonds. DRPT makes PRIIA payments directly to WMATA.**
- **State funds from Virginia were first appropriated in FY 2011 with the final year of appropriation being FY 2020.**
- **Current state funding agreement (between DRPT and WMATA) became effective on 7/1/16 and expires 6/30/20**

PRIIA - Reauthorization

- **Reauthorizes PRIIA funding for WMATA at \$2 billion over 10 years (House version) or \$1.5 billion (Senate version) beginning in FFY2020.**
 - » *\$150 million/year for capital expenses*
 - » *\$50 million/year in new capital (no match required)*
 - » *House Bill also includes \$50 million/year for operating, \$10 million of which will be dedicated to the WMATA Inspector General*
- **Requires continued local match for capital funding (\$50 million/year for Virginia)**
- **Requires implementation of Inspector General Reforms (Both versions)**
- **Senate version also requires implementation of safety task forces, new capital planning processes, enhanced transit asset management, reinforces restrictions on alternate board members, and prioritizes implementation of cyber security measures.**
- **In 2018, the Virginia General Assembly provided a contingent appropriation of \$50 million for FY2021 (CPR Bonds), to support continued funding upon Congressional appropriation.**

Other WMATA Funding Agreements

Capital Funding Agreement (Compact Jurisdictions Only)

- Agreement between compact jurisdictions and WMATA for capital projects – expired 6/30/2019
- Currently being updated to acknowledge dedicated funding and for consistency in terminology/requirements with the dedicated funding agreement
- Commonwealth is not a party to the current agreement

Commonwealth Mass Transit Fund (CMTF) allocation for WMATA - § 33.2-1526.1

- Annual DRPT Agreement with NVTC for WMATA capital and operating assistance
- 53.5% of CMTF each year; FY 20 amount is \$159,017,605

Local Payments to WMATA Capital Fund - § 33.2-3404

- DRPT Agreements with five local governments who are members of WMATA for payment of their required local share of capital funding for WMATA
- Annual local proportionate share of \$27.12 million (determined by NVTC) to DRPT, which DRPT then provides to WMATA under the dedicated funding agreement
- Agreements effective upon execution and remain so until terminated or superseded

MDOT Letter to WMATA

- **Dated July 1, 2019**
- **Notification to WMATA that Maryland is withholding \$55,590,425 in capital funds due July 1, 2019**
 - » *Operating funds from Maryland not impacted*
- **Reasons for withholding of capital funds**
 - » *Ongoing non-cooperation by WMATA on resolution of outstanding MDOT compliance audits from FY 2016 and 2017*
 - » *No legal agreement(s) for Maryland state funding beginning in FY 2020*
 - Existing Capital Funding Agreement (CFA) expired on June 30, 2019 and was not replaced or extended

Next Steps

- **July/August - DRPT will review WMATA's submittal, in coordination with the Office of the Attorney General and NVTC**
- **September – DRPT will report findings to the CTB and make a recommendation on compliance**
- **October – DRPT will present resolution to the CTB for action on compliance recommendations**
- **November – NVTC will submit their Annual Report to the CTB and present on their findings**

WMATA Annual Reporting Requirements

July 16, 2019

Commonwealth Transportation Board

Jennifer Mitchell, Director



LIGHTING POLICIES & ENERGY SAVINGS PERFORMANCE CONTRACT (EPC)

July 2019 CTB Workshop

 Garrett Moore, P.E.

July 16, 2019

Summary of Recent VDOT Activities

- **2015: Competitively procure Energy Services Contractor (ESCO)**
- **September 2017: Previous CTB Presentation**
 - **VDOT defers action on Energy Performance Contract pending investigation into potential effects of LED lighting on human health**
- **Sept. 2017 – May 2019: Develop updated lighting policies based on numerous discussions and research with key stakeholders:**
 - **Industry experts (Dr. Ron Gibbons of Virginia Tech Transportation Institute, Illumination Engineering Society, LED manufacturers)**
 - **Health policy experts (Dr. Mario Matta of AMA, Dr. George Brainard of Thomas Jefferson University Hospital, Int'l Dark Skies Assn)**
- **July 2019: Request CTB authorization of proposed LED lighting Energy Savings Performance Contract (EPC)**

Benefits and Drawbacks of Roadway Lighting

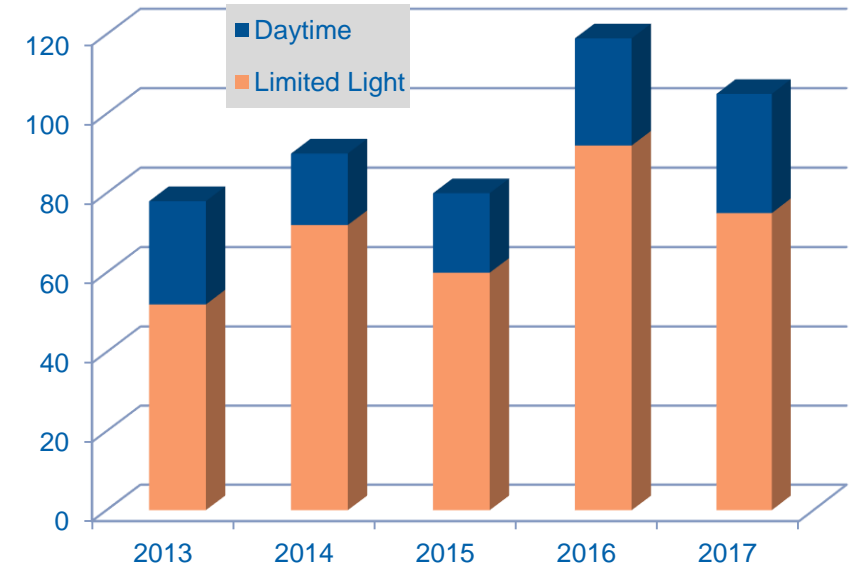
■ Benefits

- Safety benefits when smartly placed
- Reduces pedestrian crash risk
- Facilitates incident response
- Personal security in parking lots

■ Drawbacks

- Energy consumption
- Maintenance & Operations costs
- Impacts to adjacent residents
- Contributes to skyglow
- Risk of light poles being struck

Virginia Pedestrian Fatal Crashes



Current State of VDOT's Lighting

- **± 50,000 conventional + high mast fixtures**
- **Majority of lights are still High Pressure Sodium (HPS)**
 - **HPS luminaires have 5-year life span; LED luminaires are expected to last 15+ years**
- **± \$4 million per year on energy bills alone**

Location Type **	Inventory
Conventional	20,100 poles
High-mast	700 poles
Sign lighting	2500~3000 structures
Tunnels	6 tunnels (24/7 lighting)
Park & Rides	69 VDOT-owned P&Rs with lighting (20,900 spaces)
Rest areas	41 rest areas
Weigh stations	21 weigh stations

***excludes other miscellaneous lighting types such as underpasses, combination traffic signal/light poles, and aerial/marine navigation lights. Street lights and post-top lights are typically maintained by others.*

VDOT Strategies for Smarter Lighting

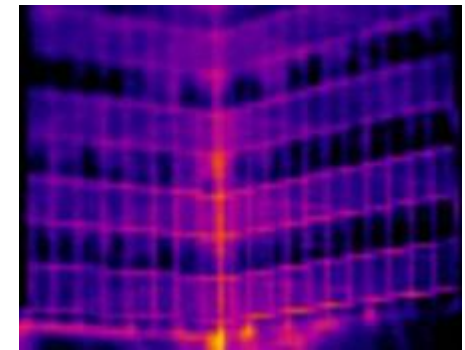
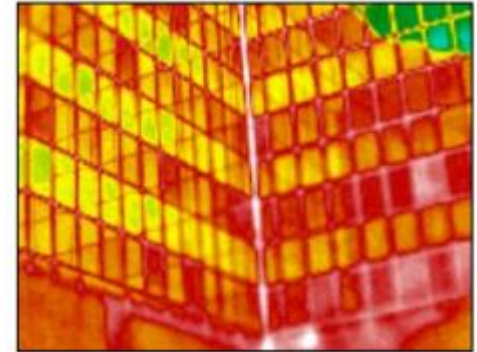
- **All new lighting will be Light-Emitting Diodes (LEDs)**
- **Only use road lighting where justified – “nodes, not roads”**
 - Discourages addition of new continuous freeway lighting
 - Promote use of lighting at traffic signals and pedestrian crossings
 - Use sign lighting (illumination of overhead signs) only where needed
- **Minimize adverse impacts of lighting**
 - Correlated Color Temperature (CCT) policy that best balances road safety vs. potential public health impacts
 - Design lighting to minimize skyglow and light trespass
- **Pursue Energy Savings Performance Contract (EPC) for road lighting**

Energy Savings Performance Contracting (EPC)

- **A state contract program managed by the Department of Mines, Minerals & Energy and the Department of General Services.**
 - **Allows agencies and public bodies to use a streamlined procurement process by selecting from a list of pre-qualified contractors**
- **Virginia Treasury Board operates and administers the Energy Lease Program**
 - **State agencies obtain consistent and competitive credit terms for financing energy efficiency improvements**
 - **Treasury Board procures a line of credit from financing companies under the terms of a Master Lease Agreement under which individual agencies can finance the energy efficiency projects over 12 and 15-year terms.**

Benefits of Energy Savings Performance Contracting

- **Well-established procedures with extensive Virginia track record**
 - **Collective state agency savings of \$18.5 million in 2017**
- **Budget-neutral: implements capital improvements without impacting capital budget**
- **Cost savings guaranteed by the competitively procured Energy Services Contractor (ESCO)**
- **Reduced long-term costs (energy and O&M)**
- **Encouraged by Virginia's leadership**
 - **2018 Virginia Energy Plan & Exec. Order #31 (2014)**



Before and after thermographic imaging of DMV HQ's windows in winter

Keys to a Successful EPC

- **ESCO services were competitively procured as per § 11-34.3**
 - VDOT competitively selected Trane in April 2015 from a list of multiple prequalified ESCOs, using established DGS procedures
- **Cash-flow positive from year one**
 - Required by Code of Virginia § 11-34.3
- **Reliable devices/controls that reduce O&M costs**
- **Owner and ESCO have equal ability to transparently Measure & Verify (M&V) future energy usage**
 - **Lighting Controls Systems (LCS) facilitates easy, transparent M&V**



Scope of Proposed Road Lighting EPC

current
powered by GE

AcuityBrands

- **9,627 conventional + high-mast LEDs**
- **Proven brands with strong track record**
 - **Fixtures: mixture of Current By GE and Acuity fixtures**
 - **Lighting Controls System (LCS): Current By GE's LightGrid system**
 - **Fixtures = 15 year warranty**
- **Locations:**
 - **Fred/Rich/HR Districts, plus portion of NOVA District**
 - **Freeway and interchange lighting**
 - **Park & Rides, rest areas, weigh stations**
- **Does not include repairing/replacing poles, conduits, etc.**

June 2019 Pro Forma Financial Analysis

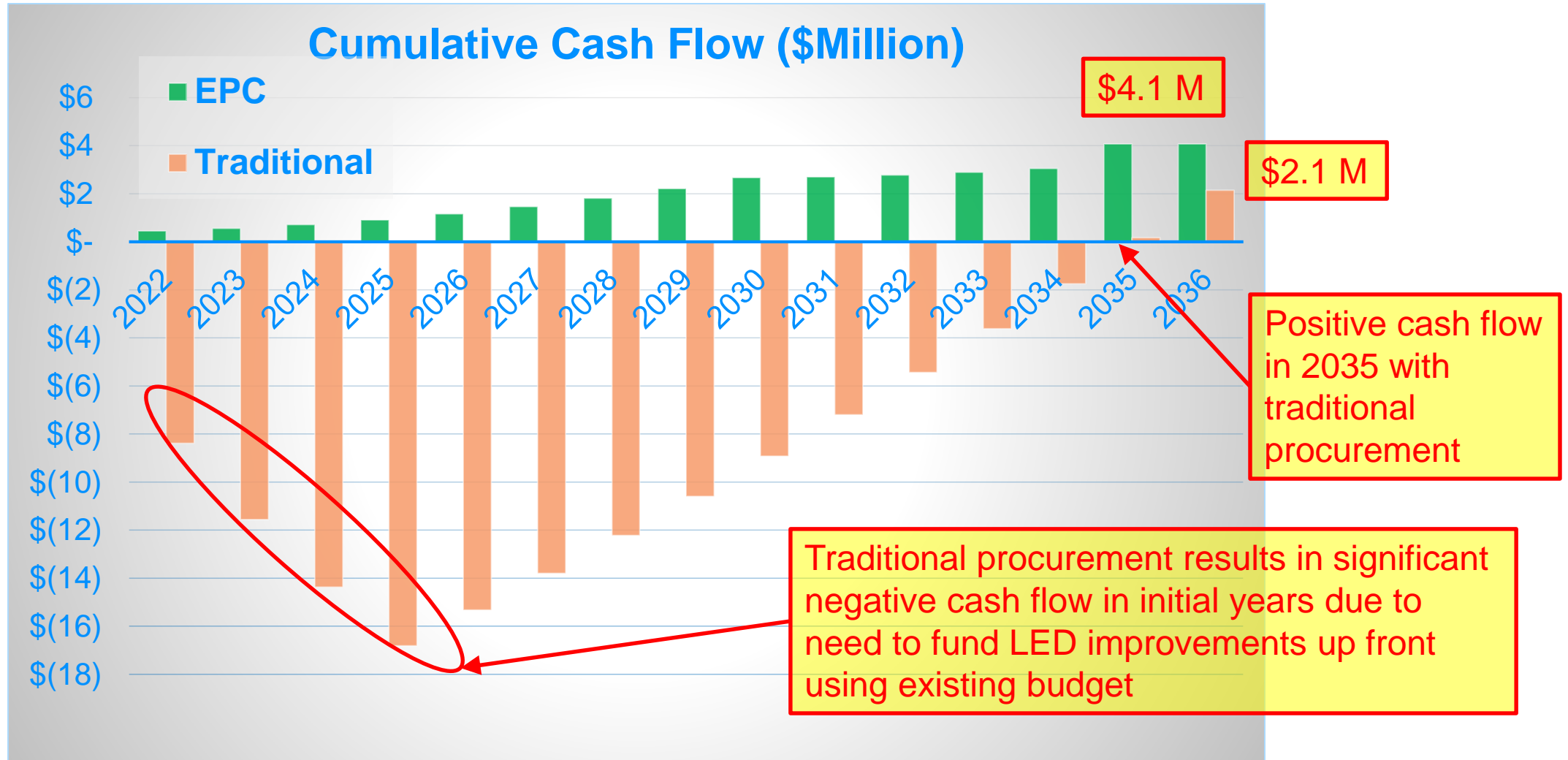
Project Costs (2020-2036)	Cost
CONSTRUCTION COSTS **	\$17.40M
Operation Costs (2018-2034):	
-- M&V and Controls	\$1.46M
-- Interest Payment	\$4.50M
TOTAL PROJECT COSTS (over 15 years)	\$23.36M

NET PROJECT SAVINGS
 = \$27.43M - \$23.36M = **\$4.1M**

Project Savings (2020-2036)	Savings
Total Energy Savings:	
-- LED savings	\$15.86M
-- LCS savings	\$2.46M
O&M Savings	\$9.11M
TOTAL PROJECT SAVINGS (over 15 years)	\$27.43M

***Includes \$500K owner contingency and Trane's \$514k previously-incurred energy audit costs*

EPC vs. Traditional Procurement (Cumulative Cash Flow)



EPC Benefits

- **Does not impact VDOT's capital budget**
- **More cumulative net savings than traditional procurement**
- **Positive cash flow begins in 2020, not 2035**
- **Turnkey solution**
- **Consistent with Exec. Order #31 & 2018 VA Energy Plan**
- **Reduced glare/skyglow/trespass impacts**
- **Reduces VDOT's carbon footprint**

Risk Mitigation

- **Conservative O&M and energy savings assumptions**
- **Negotiating cost-saving measures with Trane**
- **Review of similar EPC implemented by peer state DOT**
- **Careful vetting of selected fixture and LCS brands**
- **Long-term contract with Current by GE for LightGrid system**
- **Office of Attorney General (OAG) and Dept. of Mines, Minerals, & Energy (DMME) reviewing and assisting VDOT to vet this nontraditional contract**
 - **Department of Treasury and Governor's Office approval required before EPC can proceed**



COMMONWEALTH of VIRGINIA
Office of the
SECRETARY of TRANSPORTATION

Interstate 95 Corridor Improvement Plan

Nick Donohue
Deputy Secretary of Transportation
July 2019



I-95 Corridor Improvement Plan

District Public Input Meetings

Thursday, July 18, 2019

**Northern Virginia District
South County Middle School
8700 Laurel Crest Drive
Lorton, VA 22079
6–8 p.m.**

Tuesday, July 23, 2019

**Fredericksburg District
James Monroe High School
2300 Washington Avenue
Fredericksburg, VA 22401
6–8 p.m.**

Thursday, July 25, 2019

**Richmond and Hampton Roads Districts
Virginia State University Multipurpose Center
20809 2nd Avenue
Petersburg, VA 23803
5–7 p.m.**

Agenda

- Overview of I-95 Corridor Improvement Plan Purpose
- Significance of the I-95 Corridor in Virginia
- Summary of Data
- What to Expect Next

I-95 Corridor Improvement Plan

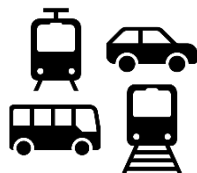
- General Assembly passed two resolutions (HJR 581 and SJR 276) requesting a study of I-95
- The CTB has initiated a data-driven study to develop the I-95 Corridor Improvement Plan that will:
 - Identify key problem areas along the corridor
 - Identify potential solutions and areas for additional review and study

The CTB will conclude public meetings by November 30, 2019 and report findings and recommendations to General Assembly in 2020.

I-95 Corridor Significance



Critical North-South Corridor



Multimodal Corridor

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

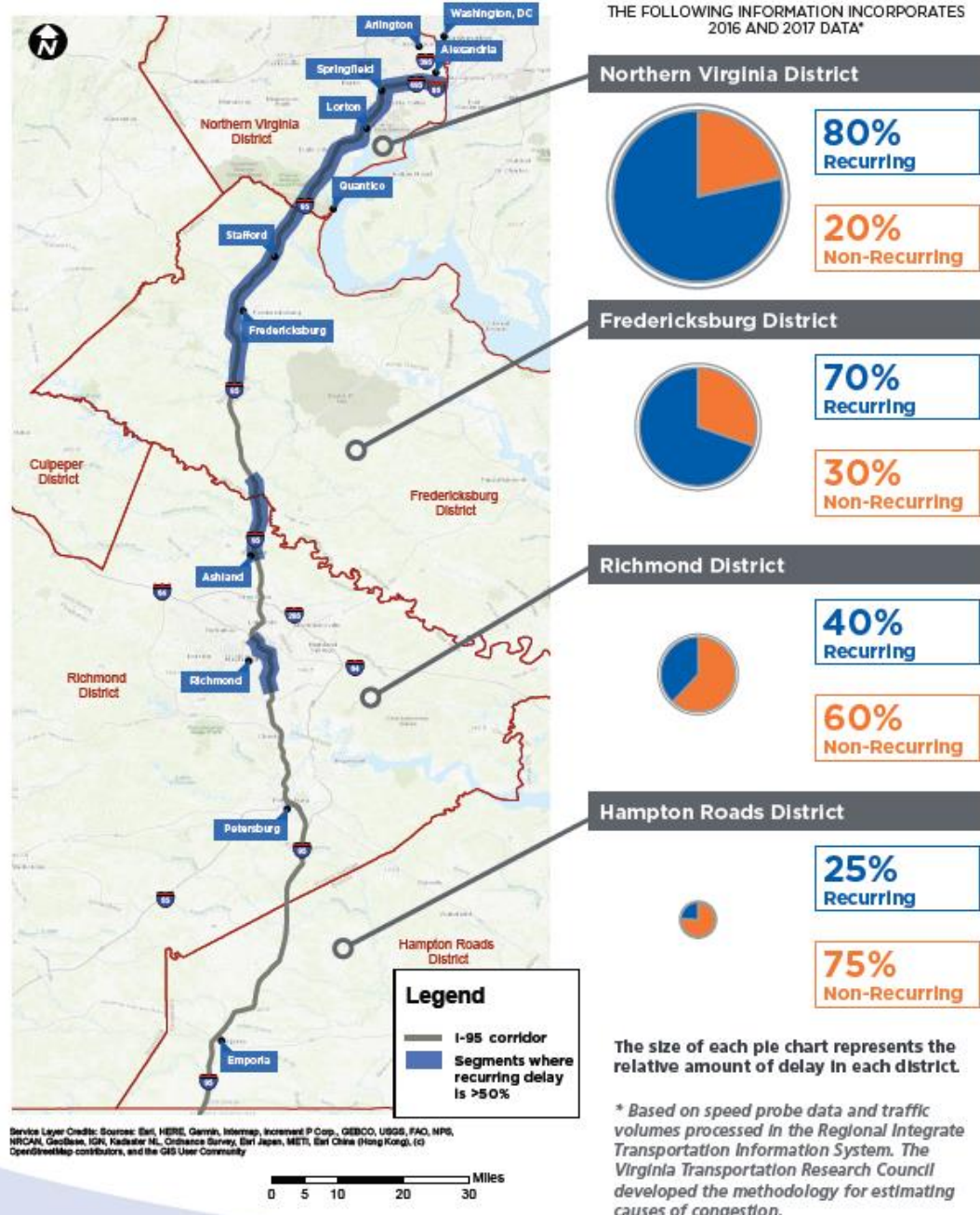
Delays on I-95

Recurring delay

- Traffic congestion

Non-recurring delay

- Incidents
- Weather
- Workzones
- Holidays
- Special events



Persons Moved Locations

Northern Virginia District

1. Beltway between Exits 173 and 174 (East of Van Dorn Street)
2. Between Exits 166 and 169 (South of Springfield)
3. Between Exits 160 and 161 (Occoquan River)

Fredericksburg District

4. Between Exits 140 and 143 (South of Express Lanes S. Terminus)
5. Between Exits 118 and 126 (North of Thornburg)

Richmond District

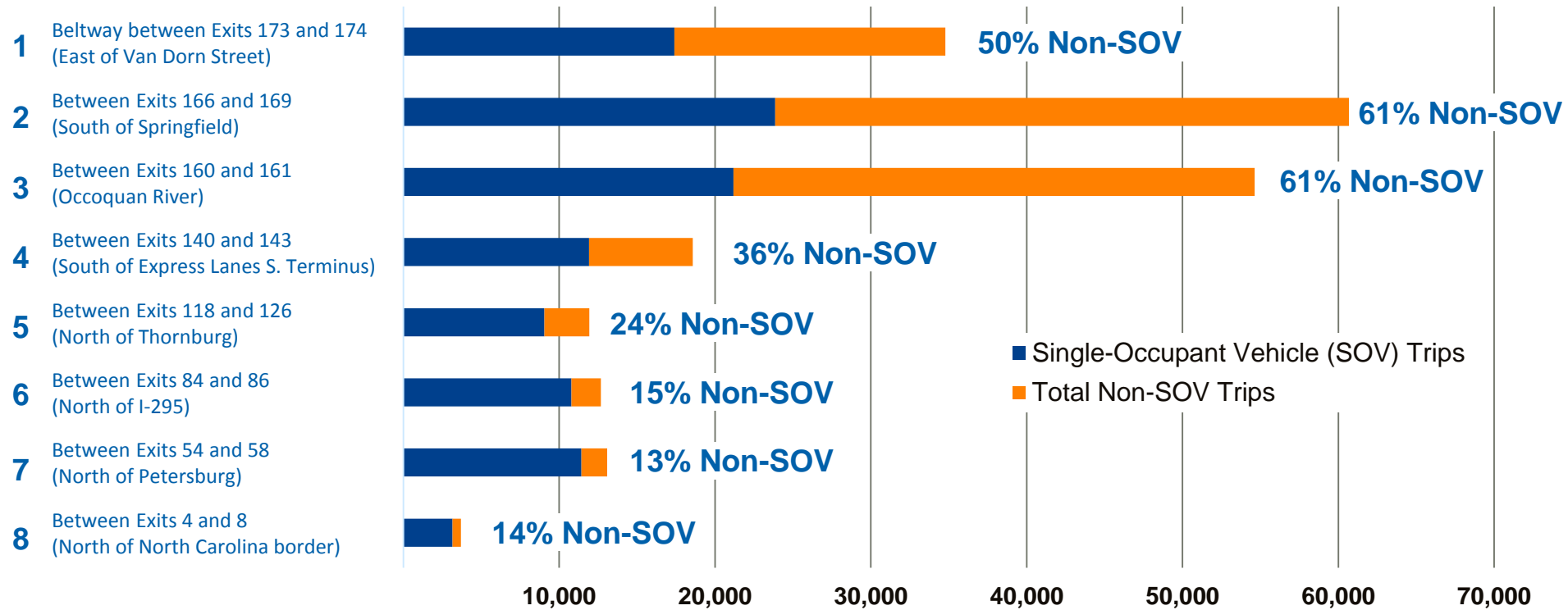
6. Between Exits 84 and 86 (North of I-295)
7. Between Exits 54 and 58 (North of Petersburg)

Hampton Roads District

8. Between Exits 4 and 8 (North of North Carolina border)

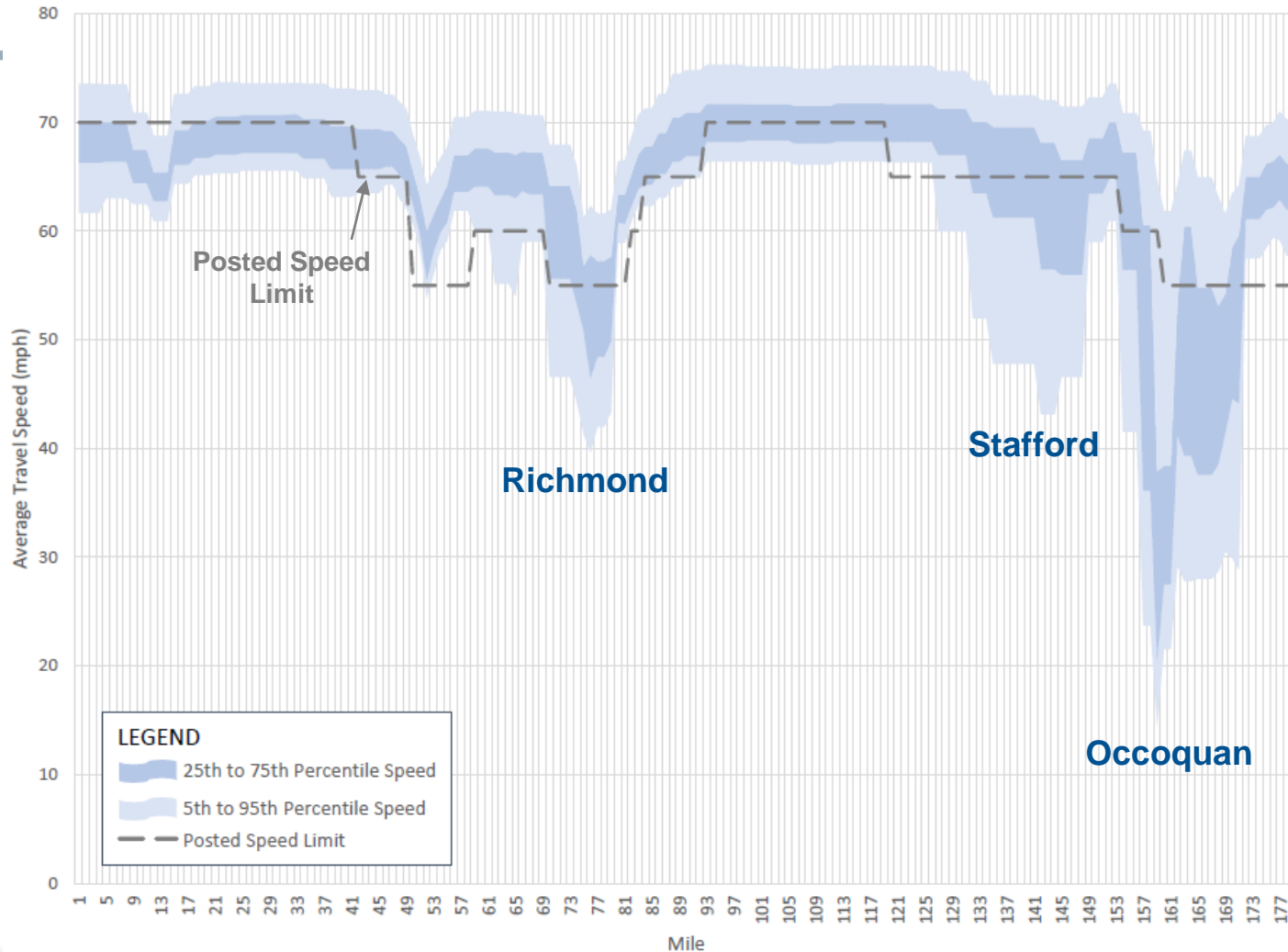


Persons Moved on Northbound I-95 in the Morning



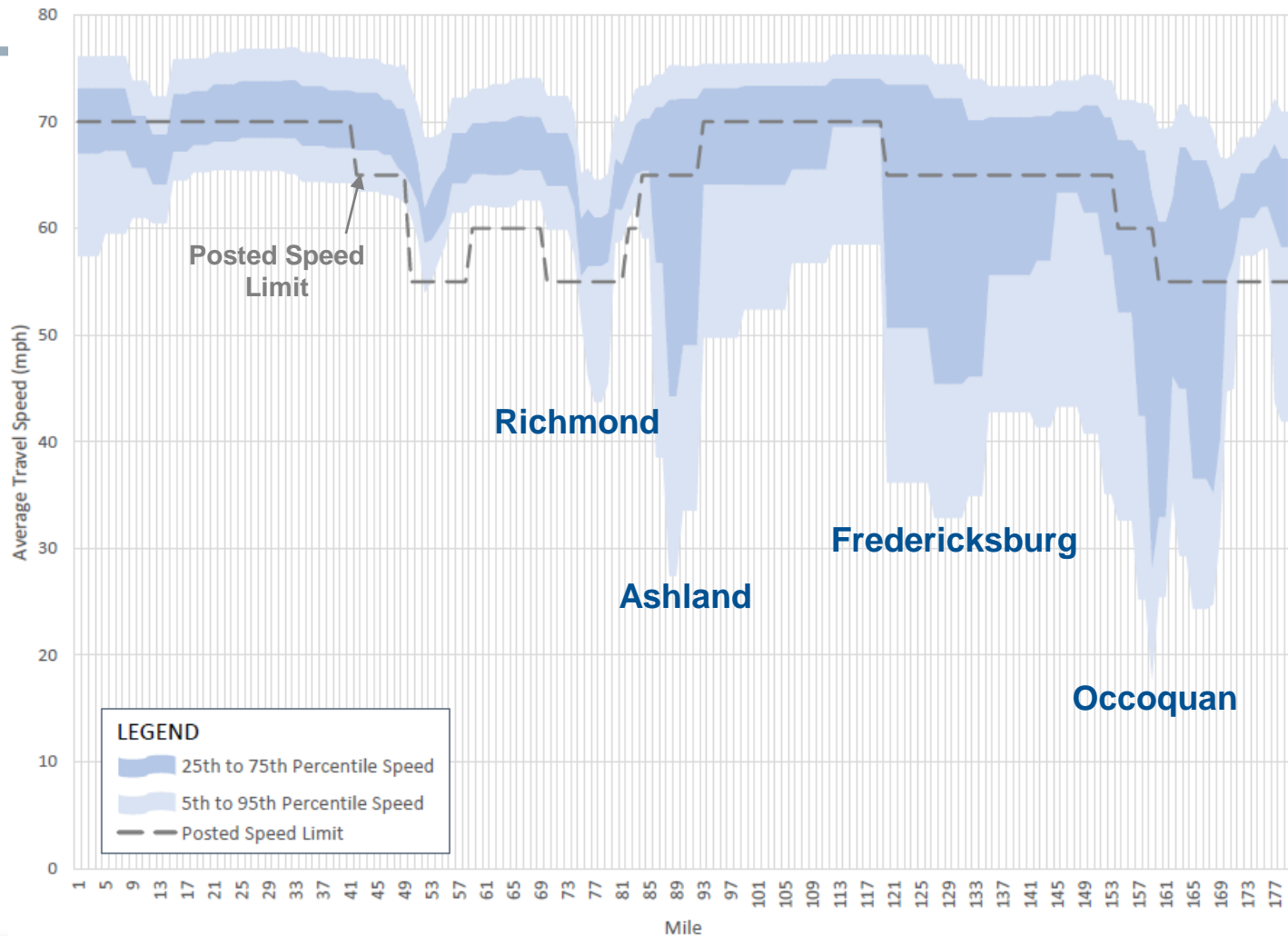
Reliability of Northbound I-95

Typical Weekday Morning



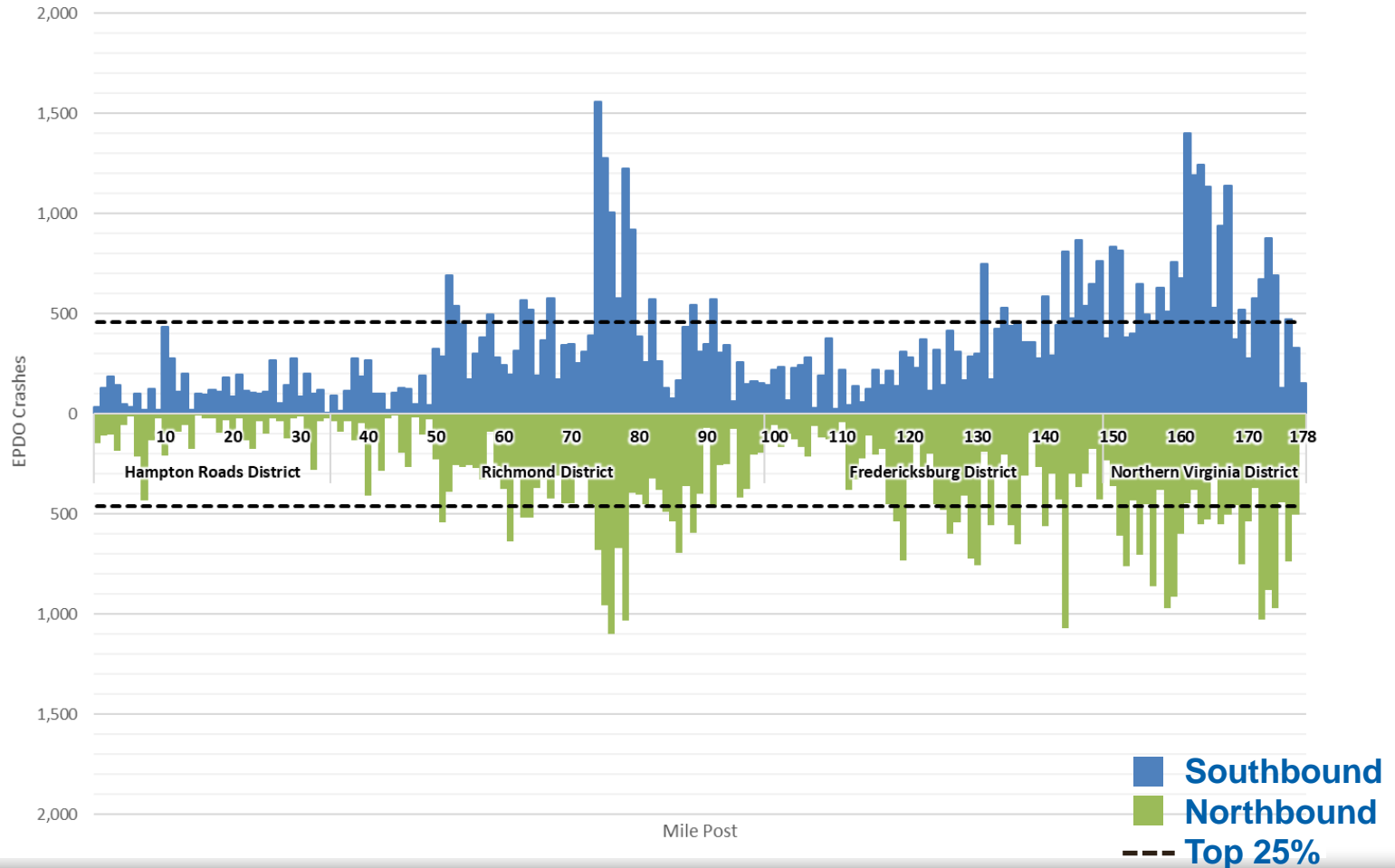
Reliability of Northbound I-95

Typical Weekend



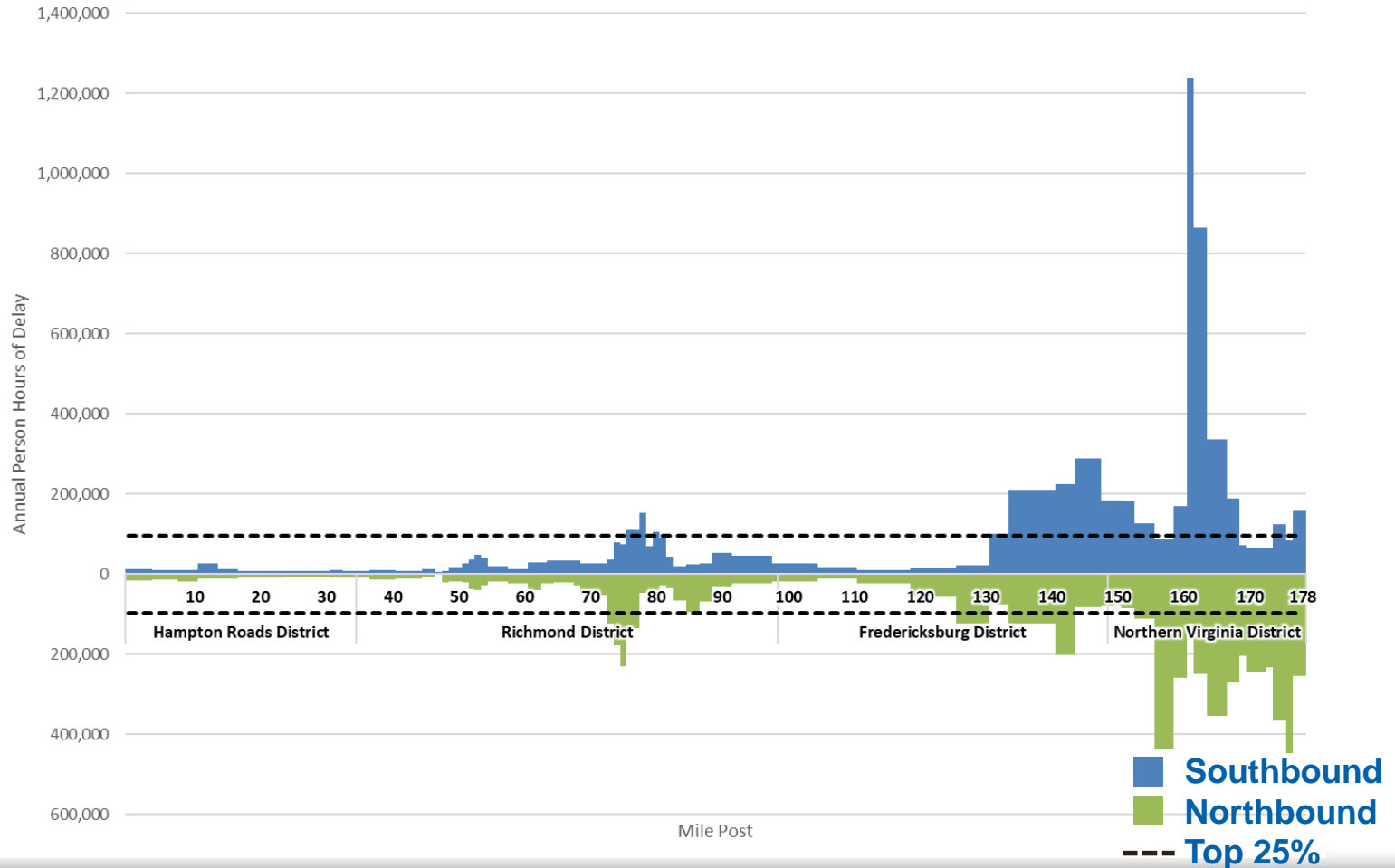
Crash Frequency and Severity Summary

One-Mile Segments

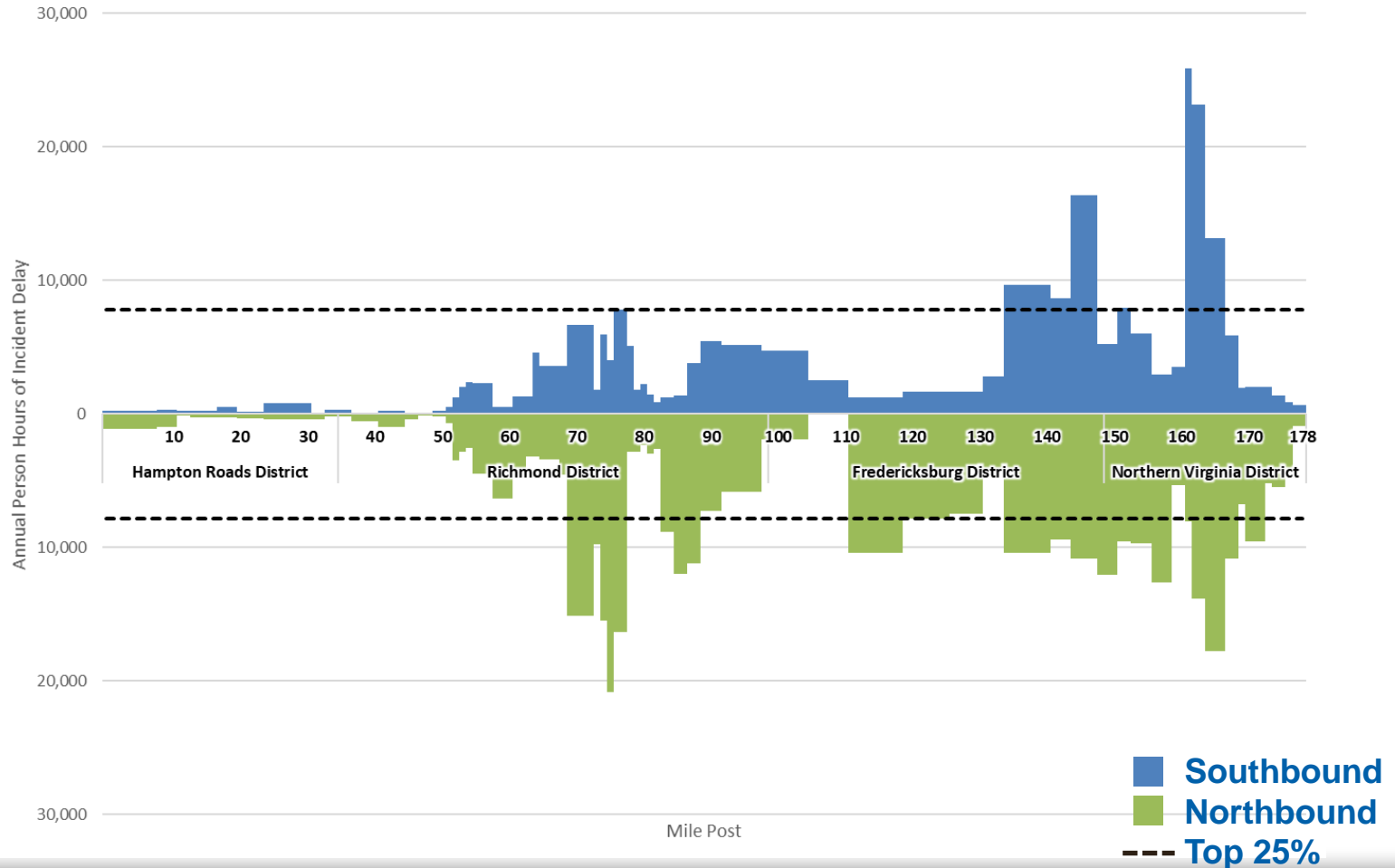


Annual Delay Summary

One-Mile Segments

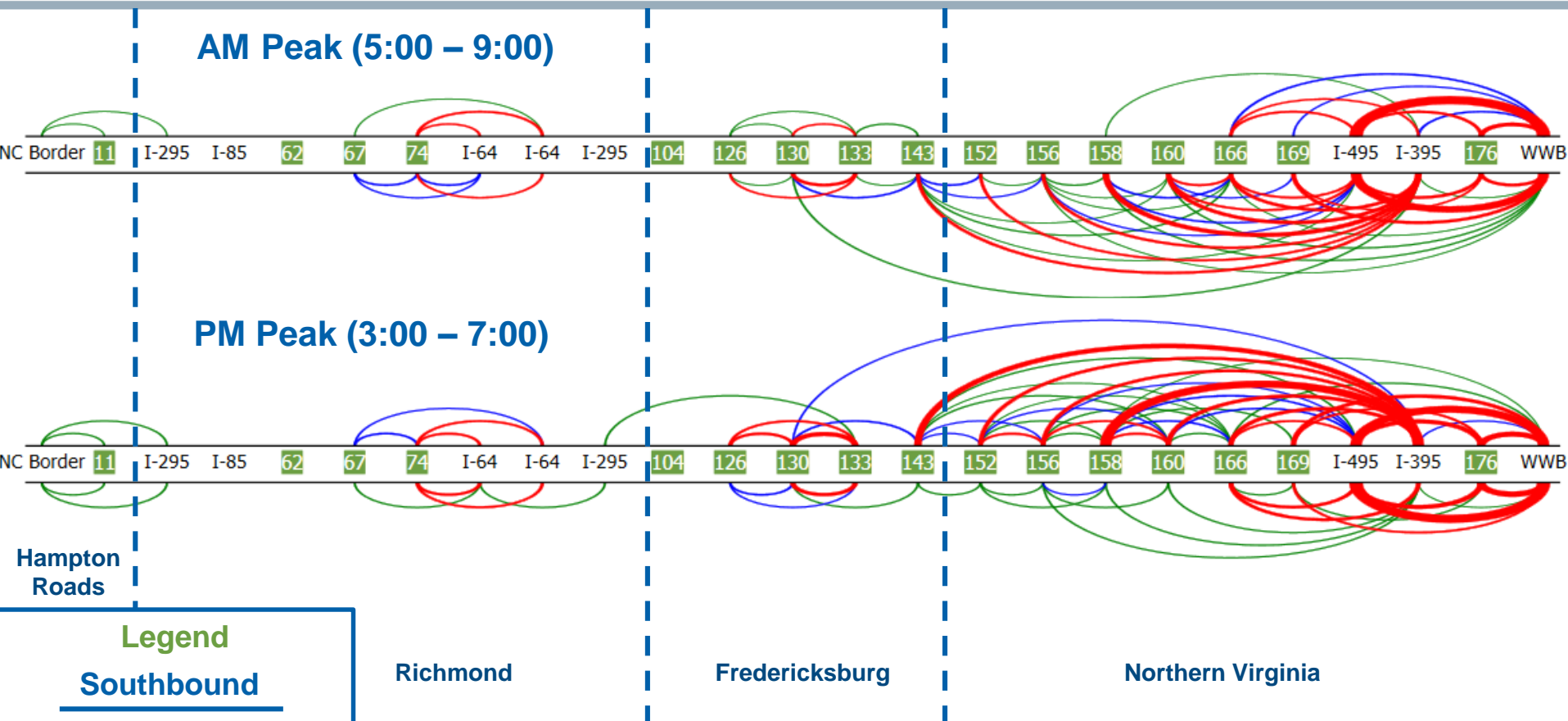


Annual Delay Due to Lane-Impacting Incidents > 1 Hour One-Mile Segments



Origin-Destination Data Summary

Typical Weekday



Legend

Southbound

Northbound

(no line) 0 to 750 trips*

751 to 1,000 trips*

1,001 to 1,500 trips*

> 1,500 trips*

*Trip values accurate to ± 30%

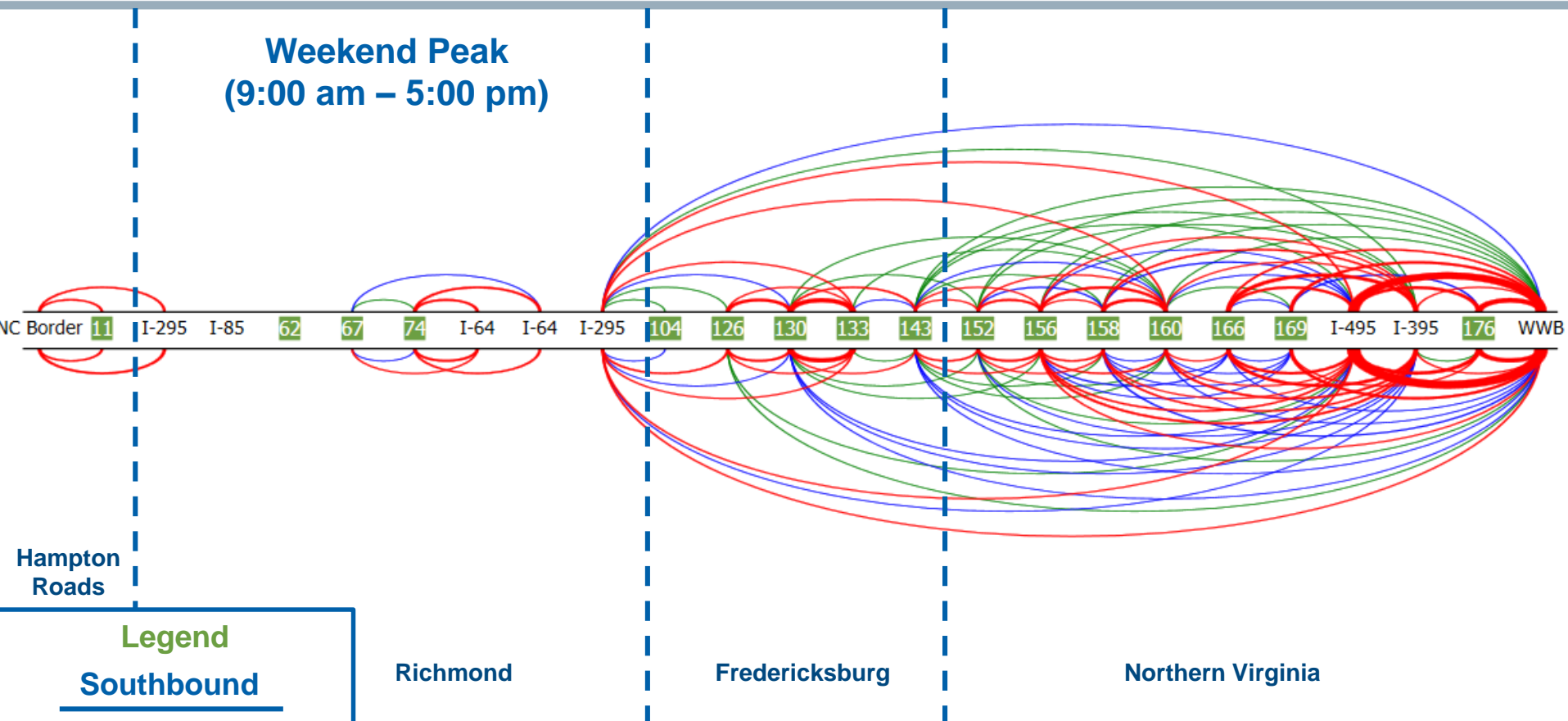
- EXIT 11 US 58
- EXIT 62 Route 288
- EXIT 67 Chippenham Parkway
- EXIT 74 East Broad Street
- EXIT 104 Route 207
- EXIT 126 US 1

- EXIT 130 Route 3
- EXIT 133 US 17
- EXIT 143 Garrisonville Road
- EXIT 152 Dumfries Road
- EXIT 156 Dale Boulevard
- EXIT 158 Prince William Parkway

- EXIT 160 Route 123
- EXIT 166 Fairfax County Parkway
- EXIT 169 Franconia Road
- EXIT 176 Telegraph Road

Origin-Destination Data Summary

Typical Sunday



Legend

Southbound

Northbound

(no line) 0 to 750 trips*

751 to 1,000 trips*

1,001 to 1,500 trips*

> 1,500 trips*

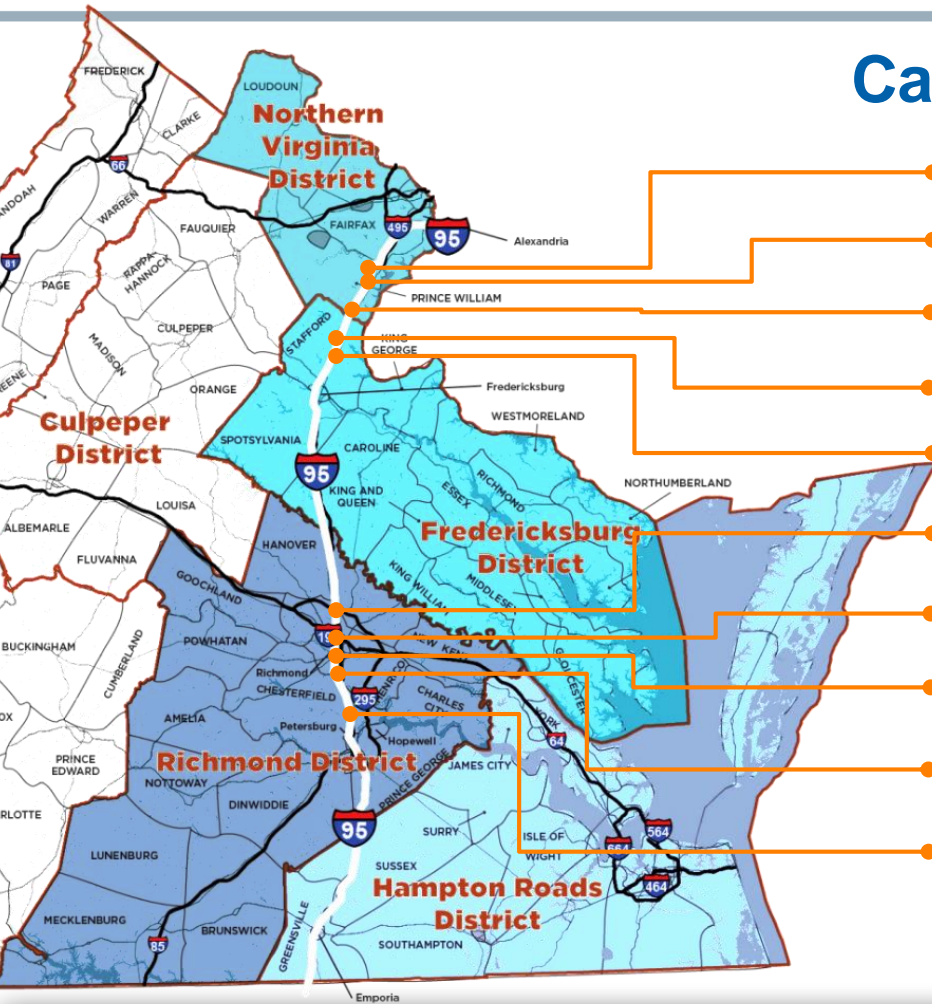
*Trip values accurate to $\pm 30\%$

EXIT 11 US 58
 EXIT 62 Route 288
 EXIT 67 Chippenham Parkway
 EXIT 74 East Broad Street
 EXIT 104 Route 207
 EXIT 126 US 1

EXIT 130 Route 3
 EXIT 133 US 17
 EXIT 143 Garrisonville Road
 EXIT 152 Dumfries Road
 EXIT 156 Dale Boulevard
 EXIT 158 Prince William Parkway

EXIT 160 Route 123
 EXIT 166 Fairfax County Parkway
 EXIT 169 Franconia Road
 EXIT 176 Telegraph Road

Current Investments in the I-95 Corridor



Capital Projects

- Southbound Auxiliary Lane at Route 123
- Opitz Boulevard Interchange
- I-95 Express Lanes Extension
- Route 630/Courthouse Road Interchange
- Rappahannock River Crossings
- Northbound I-295 Lane Reassignment
- Northbound I-64/I-195 Lane Reassignment
- Northbound Belvidere Street Acceleration Lane
- Southbound Franklin Street Ramp Improvement
- Northbound/Southbound Auxiliary Lanes at Route 10
- VRE Fredericksburg Line Improvements

Current Investments in the I-95 Corridor



New and expanded park and ride lots



VRE Fredericksburg Line



Changeable Message Signs



Cameras



Towing Programs



Safety Service Patrol

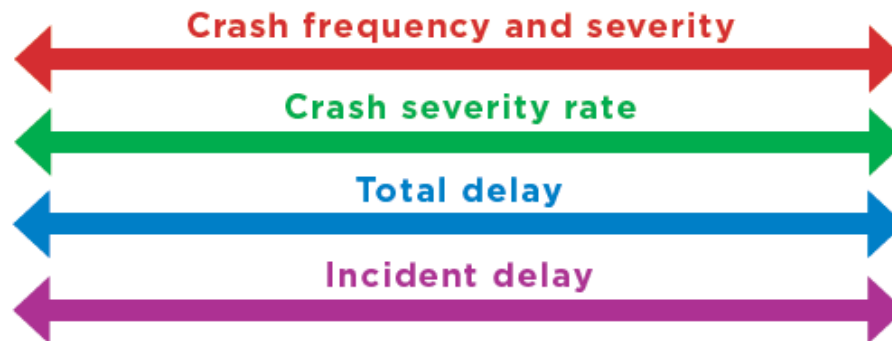
Where We are Right Now

Problem Identification

Reviewing entire I-95 corridor to identify areas for improvement based on identified problems

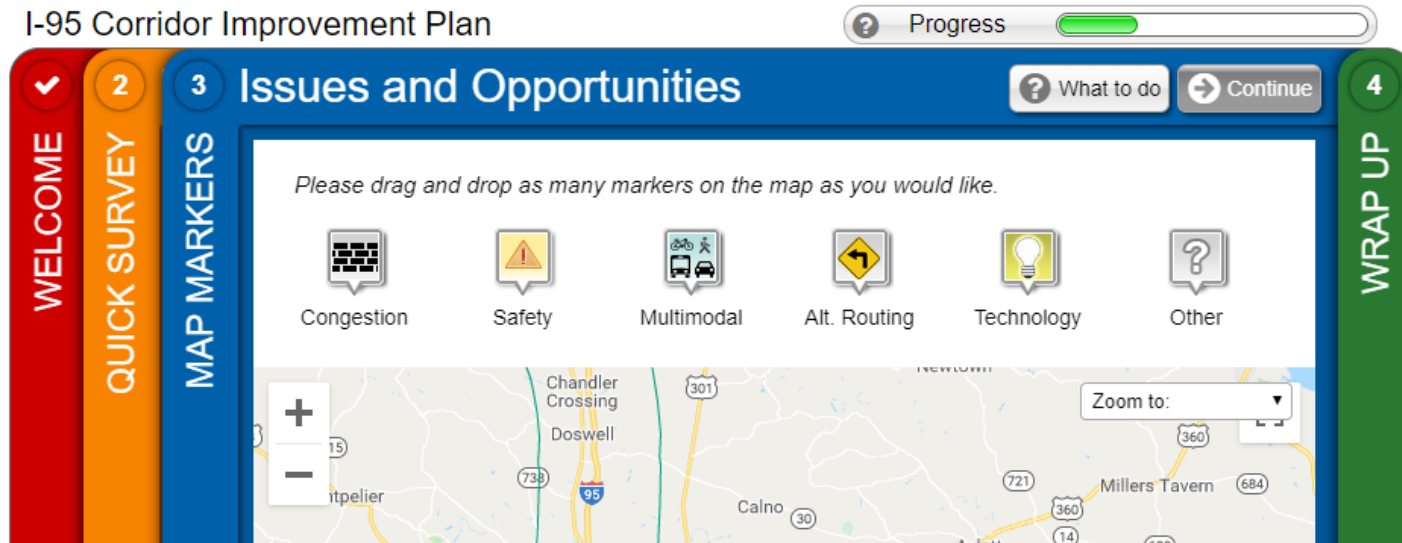
- Safety (crash frequency and severity)
- Congestion (person-hours of delay)
- Resiliency (incidents or crashes causing lane closures greater than one hour)

PERFORMANCE MEASURES



Public Meeting Materials

- Corridor overview boards
- Aerial display boards with performance measure information
- On-line survey with tablets <https://va95corridor.metroquest.com/>



Next Steps

- **CTB Updates**
- **September public meetings**
 - Review improvement recommendations
- **November public meetings**
 - Review refined improvement recommendation packages

Providing Feedback...VA95Corridor.org



Virginia Commonwealth Transportation Board

Home | Projects | Major Projects | Interstate 95 Corridor Improvement Plan

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Interstate 95 Corridor Improvement Plan

What's Being Done

The Commonwealth Transportation Board (CTB), supported by the Virginia Department of Transportation (VDOT), the Department of Motor Vehicles, and the Virginia State Police, will study Interstate 95 (I-95) to identify priorities as well as potential revenue sources that could be dedicated to improvements.

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, as well as financing options for suggested projects.

The Commonwealth Transportation Board (CTB) will receive briefings during the study time frame.

View the first CTB [presentation briefing](#), held in April 2019.

View the CTB's study launch [announcement](#).

Begin date: April 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

Contact: [Ben Mannell](#), project manager



COMMONWEALTH of VIRGINIA

Office of the

SECRETARY of TRANSPORTATION

Highway Safety Improvement Program (HSIP)

Policy Recommendations

Margie Ray

Office of Intermodal Planning and Investment

July 16, 2019



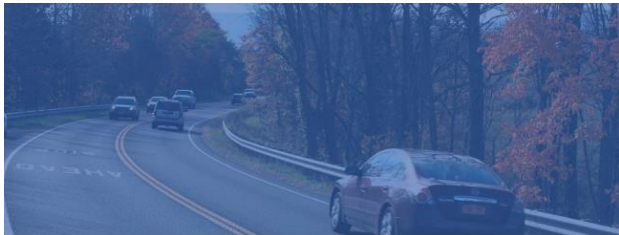
Virginia Department of Rail and Public Transportation



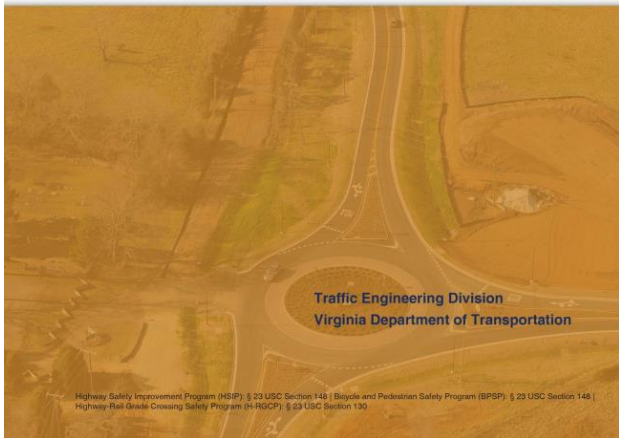
Federal Highway Safety Improvement Program Discussion Items

- **Existing HSIP Program Overview**
 - **Process Overview**
 - **Project Screening and Eligibility**
 - **Project scoring and selection for funding**
- **HSIP Program Challenges**
- **New HSIP Policy Development**
- **Next Steps**

Federal Highway Safety Improvement Program



VDOT Virginia Department of Transportation
Highway Safety Improvement Program
Implementation Guidelines



- Core FHWA program
- Requires Strategic Highway Safety Plan
- VDOT has established process for HSIP Implementation
 - HSIP Implementation Guidelines
 - Variety of crash data and tools

http://www.virginiadot.org/business/resources/FINAL_VDOT_HSIP_Implementation_Manual.pdf

Existing HSIP Process Overview

- **Fund Several Project Types:**
 - Highway Spot Projects
 - Highway Systemic Projects
 - Pedestrian & Bicycle Projects
- **Annual Process for Project Requests and Funding**
 - Application-based program
 - Process includes
 - Screening and Eligibility
 - Application Review
 - Scoring and Selection

Existing HSIP Process Overview – Screening and Eligibility

- **Must meet an emphasis area included in the Strategic Highway Safety Plan**
- **Must demonstrate Return on Investment > 1 and/or demonstrate risk reduction to transportation users**
 - **Requirement of federal code for the use of funds**
- **Must be ready for deployment**

Existing HSIP Process Overview – Scoring and Selection of Projects

- **Districts and local governments submit projects for consideration**
- **VDOT Safety team scores projects**
 - **Determines benefit cost analysis and return on investment**
 - **Determines risk reduction for targeted types of crashes**
- **Projects selected through collaborative process with Districts and VDOT Central Office**
 - **No requirement to consider highest scoring projects**
 - **No formal role for the Board**

Existing HSIP Process – Challenges

- **Projects selected for funding may not have the greatest return on investment or safety benefits**
- **District/local discretion on project submissions and priorities**
 - **May or may not be top potential safety improvement areas**
- **Limited transparency in project selection process**
- **100% of HSIP funds allocated over six years**

Existing HSIP Process – General Examples

- **Interstate Safety Improvement Projects**
 - Interstate has lowest fatality and serious injury rates
- **Bicycle/Pedestrian safety improvements targeted toward sidewalk and trail projects**
 - Most fatalities and serious injuries occur crossing roadways
- **Eligibility (especially BC ratio) viewed as sufficient to support HSIP purposes**
 - Supported investment in some projects with low BC ratio

Existing HSIP Process Examples – Interstate 95 Improvements at Route 3

- **Additional lanes and signalization to improve safety**
- **Project Complete January 2019**
- **Estimated Cost of \$23M**
- **B/C Ratio <1**



Alternative Funding Scenarios for \$23M

- **Systemic Safety Improvements of high-visibility backplates, flashing yellow arrows, and pedestrian crossings on VDOT priority pedestrian corridors each cost around \$20M**

New HSIP Policy Development: Key Policy Elements for Consideration

- **Develop Implementation Plans with prioritized categories of systemic and hybrid safety improvements and established goals and schedules for completion for each improvement type**
 - **Edge- and center-line rumble strips on primary system**
 - **Shoulder pavement wedge**
 - **Flashing yellow arrows**
 - **Chevrons**
 - **High-visibility backplates**
 - **Pedestrian crossings**
 - **Unsignalized intersections**
- **Include approach for prioritization and selection of spot improvement projects**
- **Include funding distribution approach/formula**
- **Include approach to implement the policy and advance priorities and goals**
- **Include annual reporting requirements to provide progress updates and, if necessary, course corrections**

HSIP Policy Development: Implementation Plan

Develop Implementation Plan with prioritized categories of systemic and hybrid safety improvements and established goals and schedules for eight improvement types

- **Implementation Plan will result in centralized approach for priorities and schedules to achieve greatest crash reductions**
 - **Achieves objective of advancing priorities and goals**

Recommendations

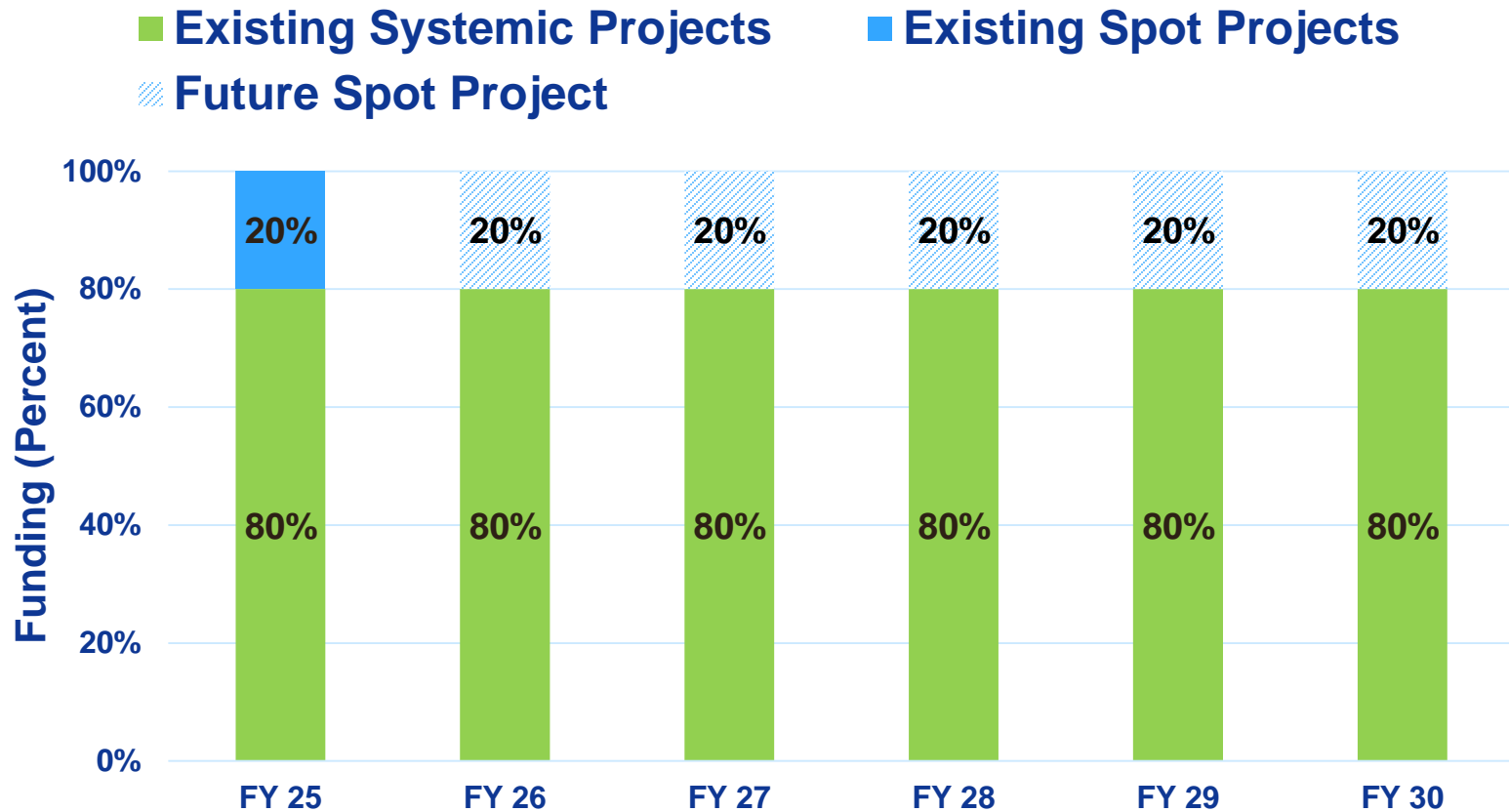
- **Implementation Plans shall**
 - **Be based on an assessment of risk and priority systemic treatments to include the locations, appropriate systemic treatments, cost estimates, and schedules on all public roads**
 - **Be consistent with the Strategic Highway Safety Plan**
 - **Be updated periodically to advance additional systemic treatments (2-3 yrs)**
 - **Include guidelines on program implementation**

HSIP Policy Development: Policy Implementation - Recommendations

Include approach to implement the policy and advance priorities and goals

- **Amend FY2020 SYIP to fund systemic safety improvements included in Initial Implementation Plan**
- **Allocate funds to systemic safety improvements identified in the Implementation Plan over the entire 6-years**
- **Restrict funding new spot improvement projects until FY2026 SYIP**
- **Provide VDOT Commissioner with flexibility to address more immediate spot improvement projects with CTB concurrence**
- **Return project savings to Statewide Account to:**
 - Cover cost increases, if needed
 - Further advance systemic treatments or
 - Fund spot improvement projects

HSIP Policy Development: Future Funding Distribution FY2025 – FY2030 SYIP



- For illustrative purposes, assumes level funding across all six years
- Assumes 5% funds for program development and approximate 80/20 split between systemic and spot improvements

HSIP Policy Development: Funding Distribution/Approach - Recommendations

Include funding distribution approach/formula

- **Funds to be distributed based on proportion of fatalities between VDOT and Locality maintained roads**
- **Funds to be allocated based on the risk-based needs assessment included in the Implementation Plan**
- **Include approach to selection of spot improvement projects (under development)**
- **Safety funds used for High Risk Rural Roads and Railway-Highway Crossings to be exempt**
- **Annual Report to include funding distribution information and recommendations on changes for Board consideration, if needed**

HSIP Policy Development: Annual Reporting Requirements - Recommendations

Include annual reporting requirements to provide progress updates and possible course corrections

- **Report should include**

- **Progress on advancement of systemic treatments**
- **Funding distribution information**
- **Anticipated benefits of investments**
- **Performance of investments**
- **Recommendations for changes to Implementation Plans**
- **Recommendations for changes to HSIP Policy**



HSIP Policy Development: Schedule and Next Steps

- **September CTB Meeting**
 - Present policy recommendations for HSIP prioritization, selection, and funding
 - Present draft initial Implementation Plan
- **Fall Transportation Meetings**
 - Obtain public comment on proposed policy
- **October CTB Meeting**
 - Provide update on public comment, present final proposed policy
- **November/December CTB Meeting**
 - CTB adopt new policy





COMMONWEALTH of VIRGINIA
Office of the
SECRETARY of TRANSPORTATION

Thank you.



ARRIVE ALIVE VIRGINIA

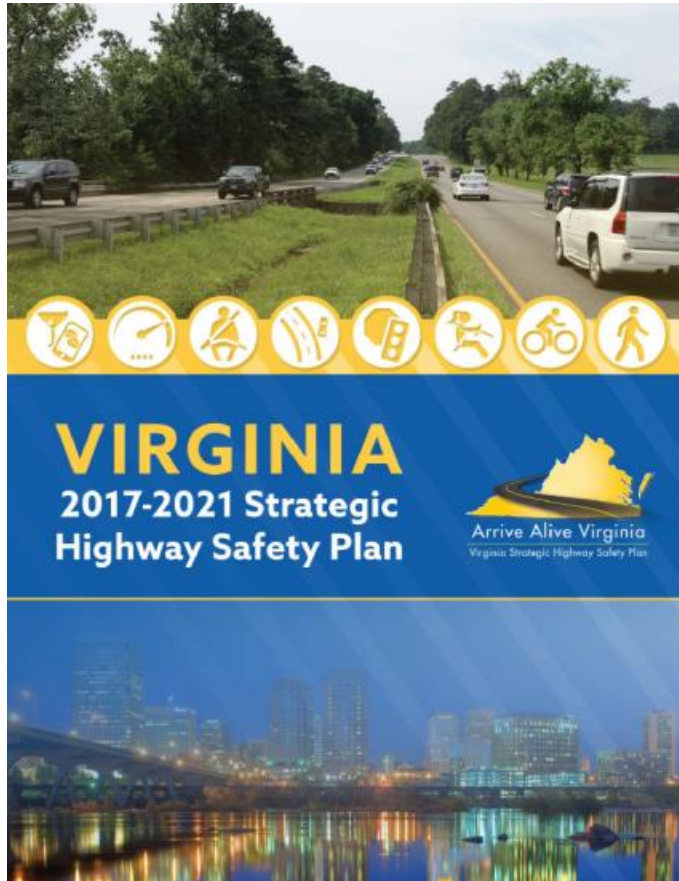
Virginia Strategic Highway Safety Plan (SHSP) 2017-2021

 Mark Cole, PE, VDOT Assistant State Traffic Engineer

July 16, 2019

ARRIVE ALIVE VIRGINIA

Virginia Strategic Highway Safety Plan (SHSP)



Vision

Toward Zero Deaths

Mission

Save Lives and Reduce Injuries
through 4E's of:



http://www.virginiadot.org/info/resources/SHSP/VA_2017_SHSP_Final_complete.pdf

2017-2021 SHSP Emphasis Areas

Emphasis Areas

Roadway Departure

Intersections

Impaired Driving

Occupant Protection

Speed

Young Drivers

Pedestrians

Bicyclists

Special Safety Areas

EMS

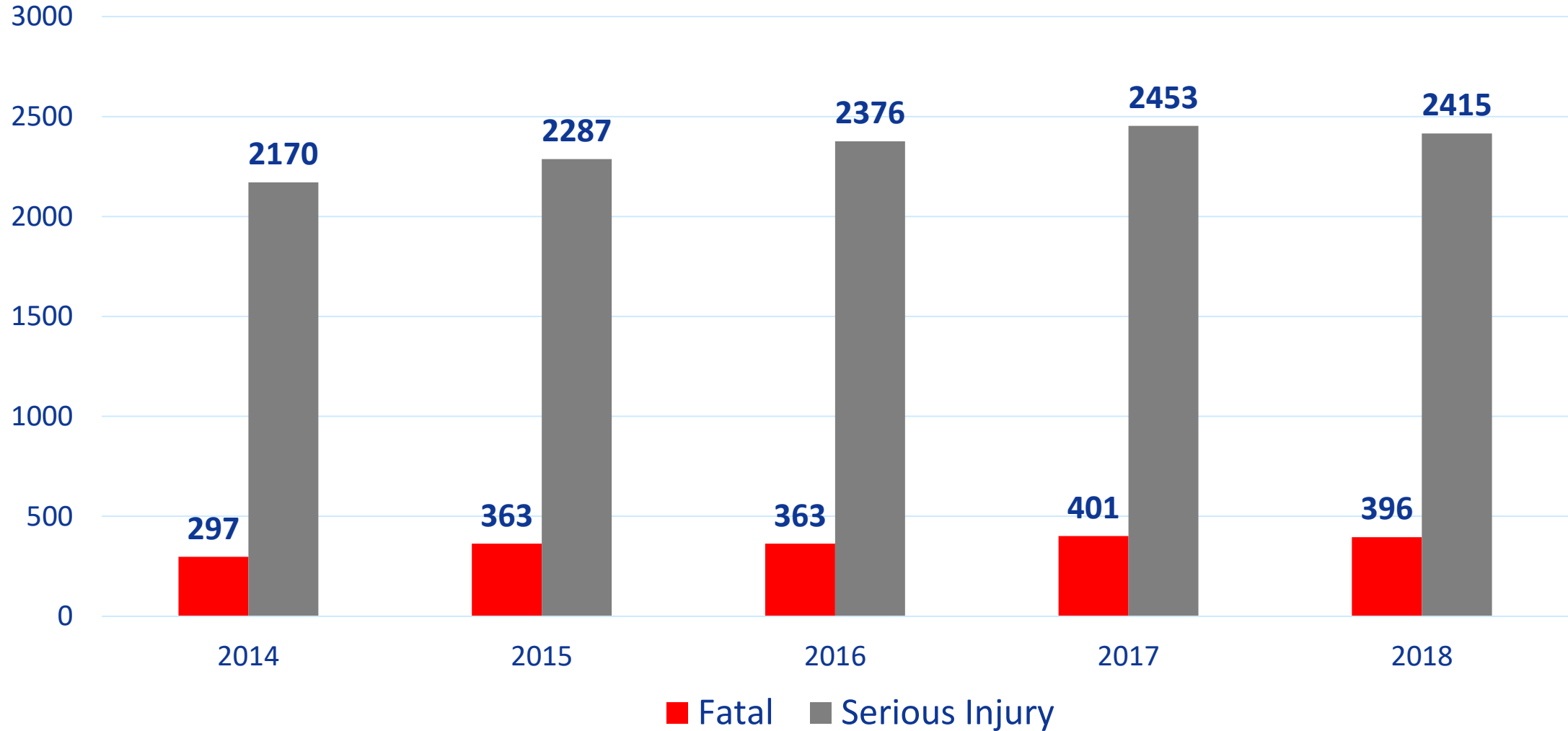
Connected / Autonomous
Vehicles

Data



Road Departure Crashes

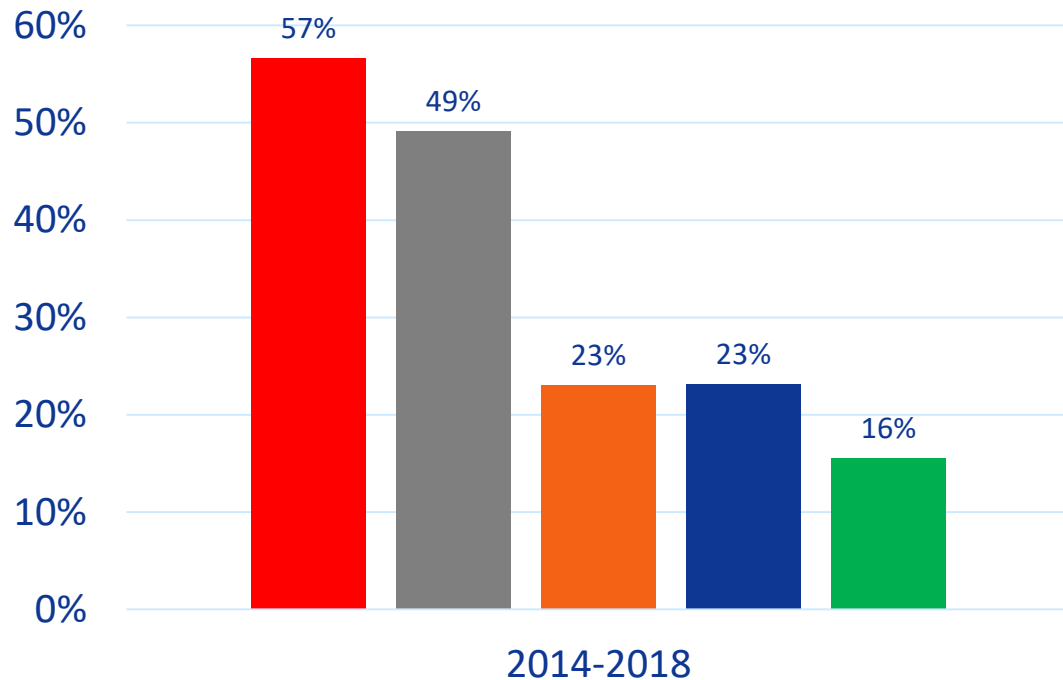
Virginia Fatal & Serious Injury Roadway Departure Crashes



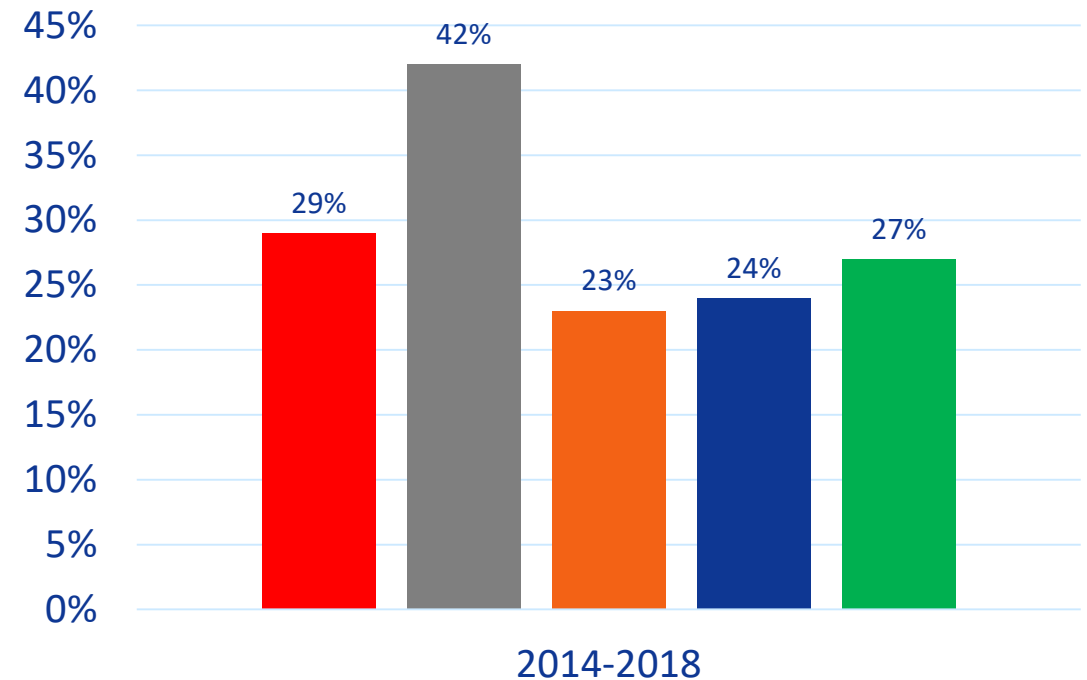
Virginia Roadway Departure Crashes

% Crashes Involving Big 4 Behaviors

Fatal



Serious Injury



■ Unbelted ■ Speeding ■ Drinking ■ Distracted ■ None

Annual Road Departure Crashes By District

2016 - 2018 Average

District	People			Fatality and Injury Rate*		
	Death	Ser. Inj.	All Injuries	Death	Ser. Inj.	All Injuries
Bristol	33	248	1,103	0.74	5.59	24.81
Salem	51	358	1,455	0.69	4.87	19.80
Lynchburg	48	270	1,020	1.16	6.57	24.83
Richmond	75	570	2,371	0.49	3.73	15.52
Hampton Roads	69	521	2,359	0.43	3.24	14.68
Fredericksburg	33	229	844	0.53	3.69	13.62
Culpeper	31	245	1,005	0.61	4.84	19.84
Staunton	44	285	1,240	0.60	3.92	17.06
Northern Virginia	33	231	1,336	0.17	1.20	6.97
Statewide	415	2,956	12,733	0.49	3.48	14.99

* Rate as per 100M DVMT

Virginia Road Departure Crashes By Rural/Urban

63% of Fatal and 55% of Serious Injury RD Crashes → Rural roads

Functional Class	2018 Death Rate*	2018 Serious Injury Rate*
Rural Interstate	0.21	2.42
Rural Arterial	0.96	4.68
Rural Collector/Local	1.58	11.23
Urban Interstate/Freeways	0.20	1.93
Urban Arterial	0.28	1.66
Urban Collector/Local	0.29	2.11
Statewide Average	0.49	3.46

* Rate per 100M VMT

SHSP Roadway Departure Strategies and Actions

Strategy 1. Reduce the likelihood that a vehicle will leave the roadway

Strategy 2. Minimize the consequences of leaving the roadway

Example Actions:

- 1.1,1.2 - Install roadway departure countermeasures where appropriate
- 1.3 - Post appropriate speed limits
- 1.6 - Improve/widen road shoulders and install safety edge
- 2.1 - Install roadside safety devices (e.g., guardrail)
- 2.3 - Remove/shield trees and other fixed objects in the clear zone

Roadway Departure Crashes - Proven Countermeasures

In Virginia, 87% of serious RD outcomes are from - fixed object, head on, and rollover crashes

Edge line Rumble Strips



Up to 50% crash reduction

Curve Signs



Up to 16% crash reduction

Centerline Rumble Stripe



Up to 60% crash reduction

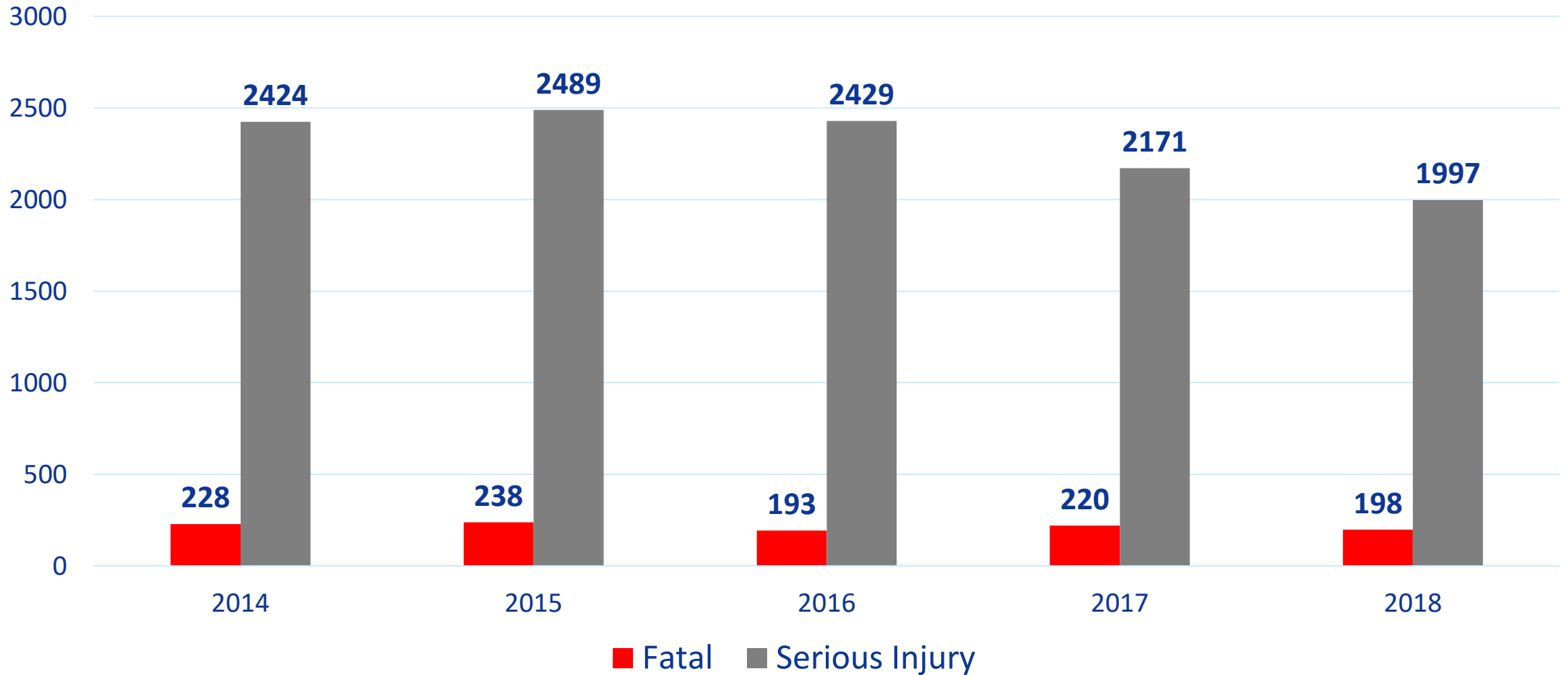
Pavement Wedge



Up to 20% crash reduction

Intersection Crashes

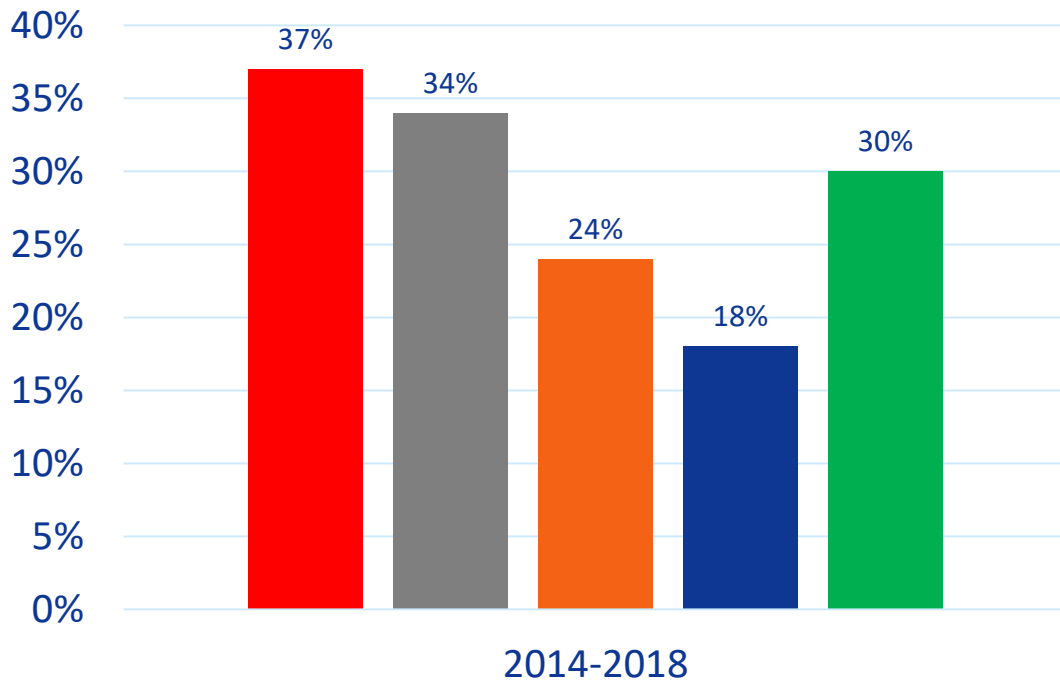
Virginia Fatal & Serious Injury Intersection Crashes



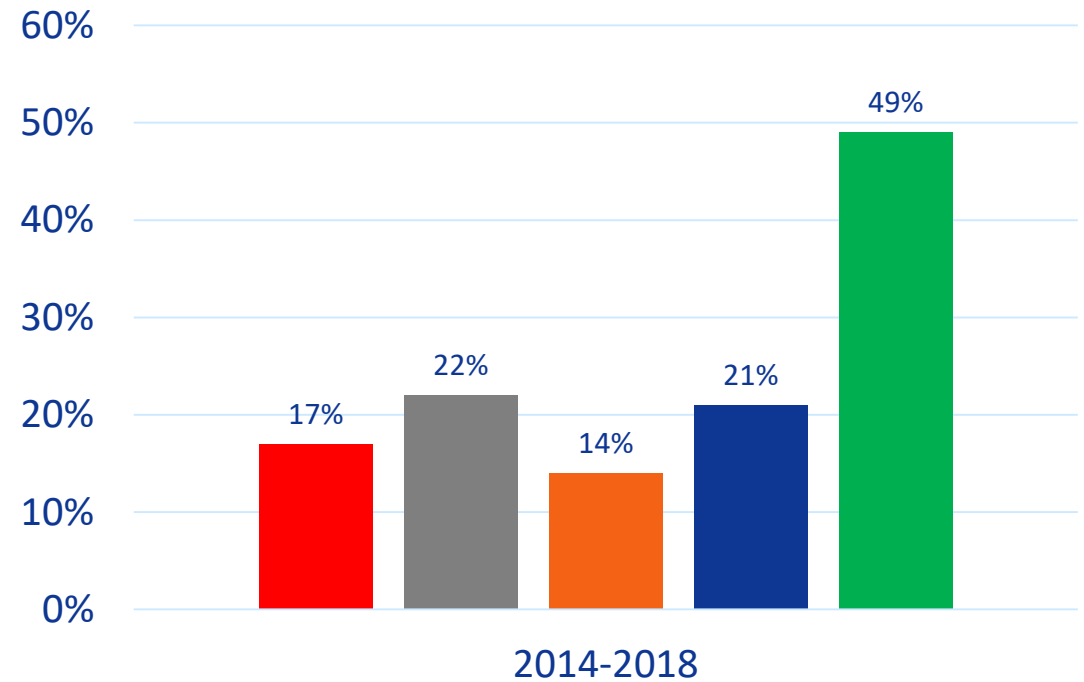
Virginia Intersection Crashes

% Crashes Involving Big 4 Behaviors

Fatal



Serious Injury



■ Unbelted ■ Speeding ■ Drinking ■ Distracted ■ None

Annual Intersection Crashes By District

2016 – 2018 Average

District	People			Fatality and Injury Rate*		
	Death	Ser. Inj.	All Injuries	Death	Ser. Inj.	All Injuries
Bristol	11	121	766	0.26	2.73	17.50
Salem	25	249	2,043	0.34	3.39	27.79
Lynchburg	14	165	1,358	0.35	4.02	32.89
Richmond	32	437	5,729	0.21	2.86	36.93
Hampton Roads	47	679	7,835	0.29	4.22	48.87
Fredericksburg	21	204	1,745	0.33	3.28	27.80
Culpeper	12	160	1,359	0.24	3.17	26.77
Staunton	20	183	1,559	0.28	2.51	21.51
Northern Virginia	29	480	6,751	0.15	2.51	34.93
Statewide	211	2,678	29,145	0.25	3.15	34.31

* Rate as per 100M DVMT

SHSP Intersection Strategies and Actions

Strategy 1. Reduce crashes and injuries through design changes

Strategy 2. Improve public comprehension and compliance with intersection traffic control devices

Example Actions:

- 1.1 - Deploy technology to allow real-time signal monitoring
- 1.3 - Deploy access management strategies to reduce conflict points
- 1.7 - Design and construct intersections for all road users
- 2.1 - Produce websites, brochures, and updates to driver's manual
- 2.4 - Update traffic signal timing

Intersection Crashes - Proven Countermeasures

In Virginia, 82% of serious intersection crashes are angle, fixed object, rear end, and pedestrian crashes

High-visibility Backplates



Up to 15% crash reduction

Unsignalized Intersection Sign and Marking Enhancements



Up to 10% crash reduction

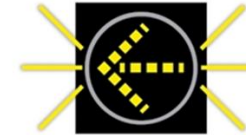
Flashing Yellow Arrow



Steady Red Arrow
Drivers turning left must stop and wait (except where permitted by law).



Steady Yellow Arrow
Stop, if you can do so safely.



Flashing Yellow Arrow
Proceed with left turn after yielding to oncoming traffic and pedestrians.



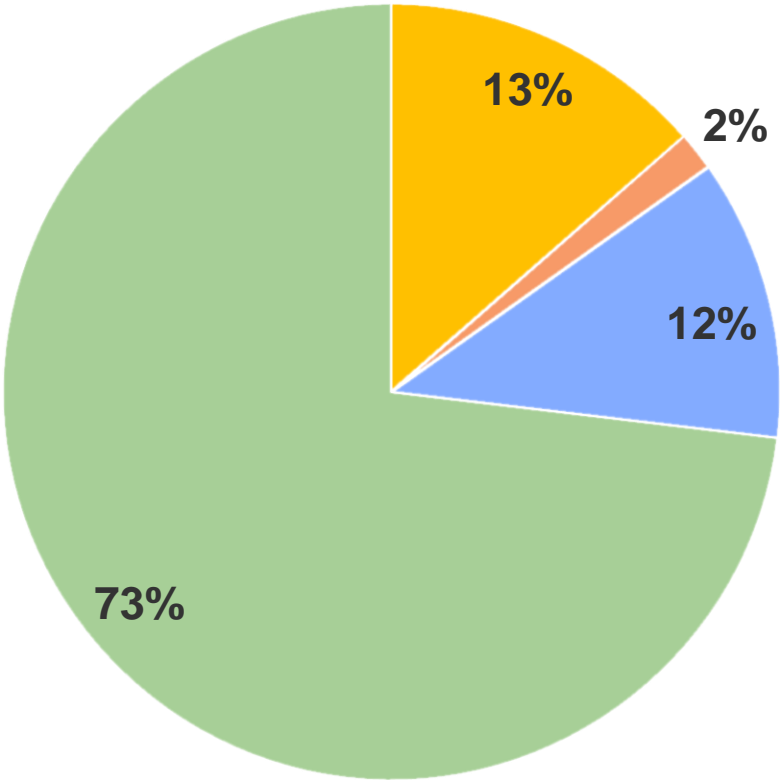
Steady Green Arrow
Proceed with left turn.

Up to 20% crash reduction

Pedestrian Crashes

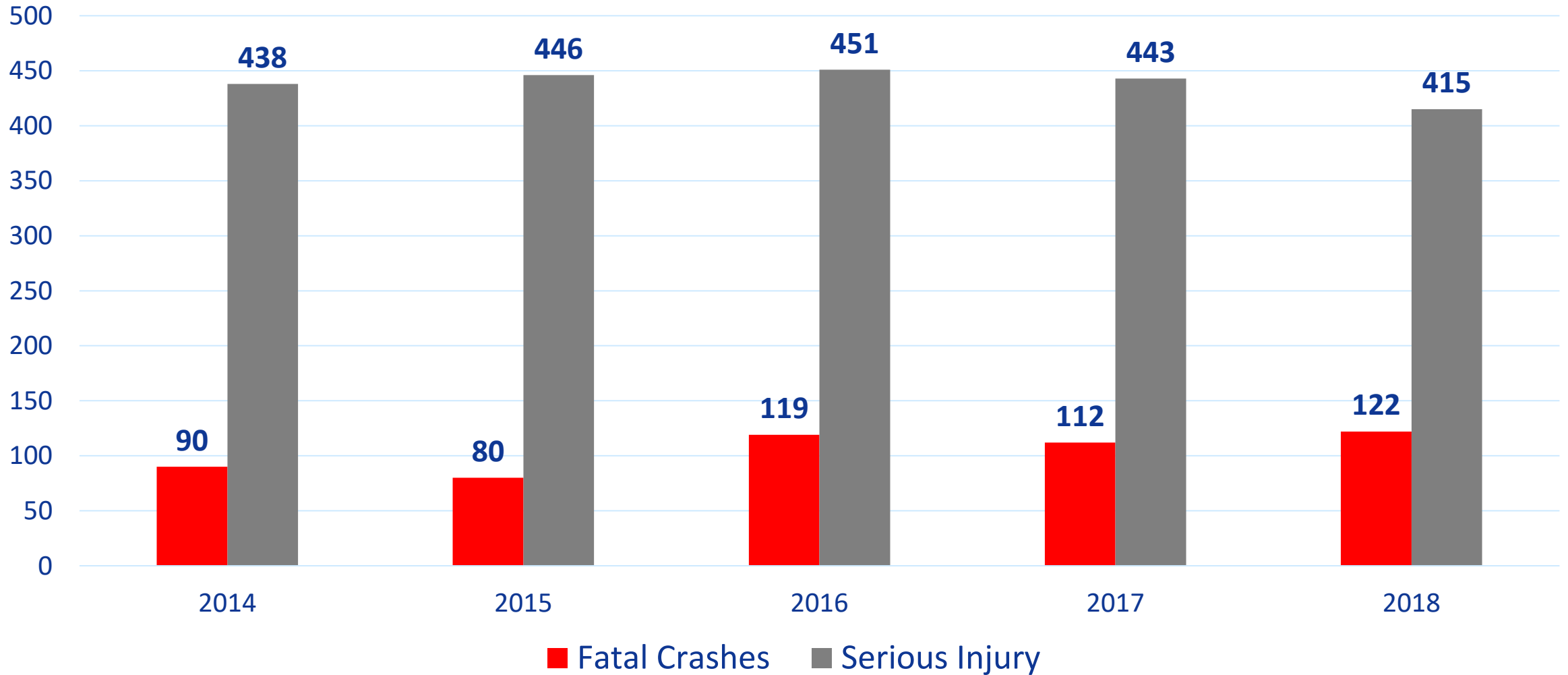
Virginia Traffic Deaths by Roadway User Type (2014-2018)

In 2018,
231 vulnerable
road users died,
28% of
all traffic
deaths



■ Pedestrians ■ Bicyclists ■ Motorcyclists ■ Other Motorists

Virginia Fatal & Serious Injury Pedestrian Crashes



Annual Pedestrian Crashes By District

2016 – 2018 Average

District	People			Fatality and Injury Rate*		
	Death	Ser. Inj.	All Injuries	Death	Ser. Inj.	All Injuries
Bristol	4	11	30	1.20	2.95	8.19
Salem	8	31	87	2.03	7.48	21.14
Lynchburg	6	16	45	1.13	3.18	8.95
Richmond	29	95	321	1.62	5.36	18.12
Hampton Roads	26	122	402	6.41	30.01	99.23
Fredericksburg	9	15	55	0.35	0.60	2.22
Culpeper	4	15	69	0.33	1.18	5.30
Staunton	8	25	75	1.13	3.50	10.64
Northern Virginia	25	124	539	4.56	22.27	97.13
Statewide	119	452	1,623	1.41	5.33	19.14

* Rate as per 100,000 population

5 Big Issues Relevant to Pedestrian Safety

1. Crossing the Street/Road

- Over 90% of Virginia's pedestrian deaths & injuries occur when crossing the street

2. Land Use

- If its urban or suburban, pedestrians will almost always be present and need to cross

3. Speed

- Chance of death increases with speed, especially for peds and other vulnerable road users

4. Visibility

- $\frac{3}{4}$ or 77% of pedestrian deaths occur in limited light conditions.

5. Size of Vehicle that strikes pedestrian

- Virginia has seen an increase in light truck/SUV Vs. pedestrian crashes, similar to national trend

SHSP Pedestrian Strategies and Actions

Strategy 1. Identify corridors with potential for pedestrian crashes and apply countermeasures

Strategy 2. Educate roadway user on appropriate behavior

Example Actions:

- 1.1 - Identify pedestrian corridors and crash hot spots
- 1.5 - Enhance pedestrian accommodations at signalized intersections
- 2.1 - Enhance outreach materials to remind roadway users of pedestrian safety
- 2.2 - Conduct pedestrian safety outreach and education to targeted populations

Pedestrian Crashes - Proven Countermeasures

In Virginia, over 90% of serious pedestrian crashes occur while crossing the road and most also occur during limited light conditions

High-visibility Crosswalk



Up to 40% crash reduction

Ped Countdown Signal



Up to 40% crash reduction

Ped Refuge Island



Up to 46% crash reduction

Rectangular Rapid Flashing Beacon



Up to 47% crash reduction

Concluding Thoughts

- **Roadway Departure, Intersection and Pedestrian crashes drive death and serious injury numbers in Virginia**
- **Urban areas tend to have more crashes but lower crash rates**
- **Rural areas tend to have fewer (but more severe) crashes**
- **Pedestrian crash outcomes greatly influenced by speed and presence of pedestrian road crossing infrastructure**
- **Low-cost/high-benefit, systemic safety countermeasures exist to help address predominate crash issues**

Questions?

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COMMONWEALTH of VIRGINIA

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SMART SCALE Round 3 Review

SMART SCALE and Other Policies Over Past Five Years



Summary



- Indirect Benefits of SMART SCALE
- Review of application intake, screening and validation
- Review of Cost Estimation and Program Performance
- Discussion of Analytical methods, scoring results, and possible process improvements

Policy Reforms Related to SMART SCALE



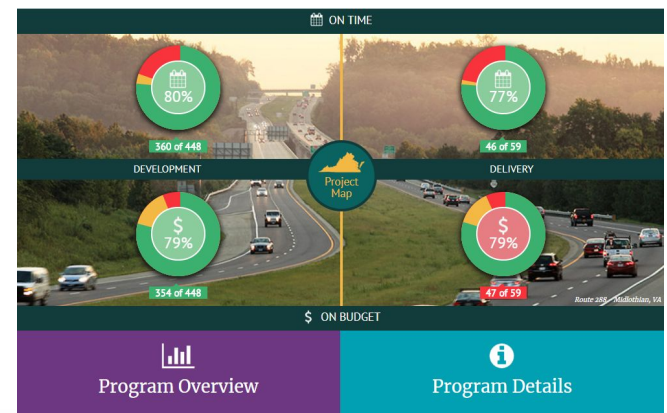
- The positive effects of full funding cannot be overstated
- 53 of 163 projects selected in Rd 1 (included in the FY 2017-2022 SYIP) had been partially funded projects in the previous year FY 2016-2021 SYIP
 - As of June 2015: \$1.49 Billion in total project costs
 - \$450 Million in identified allocations
 - As of June 2016: \$1.87 Billion in fully funded total project costs
 - \$1.05 Billion in leveraged funds
 - \$824 Million in SMART SCALE allocations
- **Well Known Examples:**
 - Rappahannock River Crossing - SB (Fredericksburg): \$9.5M allocated
 - Warrenton Interchange (Culpeper): \$1M allocated
 - RTE 277 Widening (Staunton): \$6.7M allocated
 - I-64 Widening from 295 to Exit 205 (Richmond): \$1.8M allocated

SMART SCALE Dashboard

Changing how we track performance



- **SMART SCALE Dashboard was launched in January 2017**
- **Changed how we track project development**
 - 10 milestones in project development as opposed to just advertisement date
 - Track through project award - to close gap between ad and award
 - Rules designed to encourage early start/finish
- **What has been the impact?**
 - Overall, milestones are being completed earlier
 - Localities struggle to meet targets

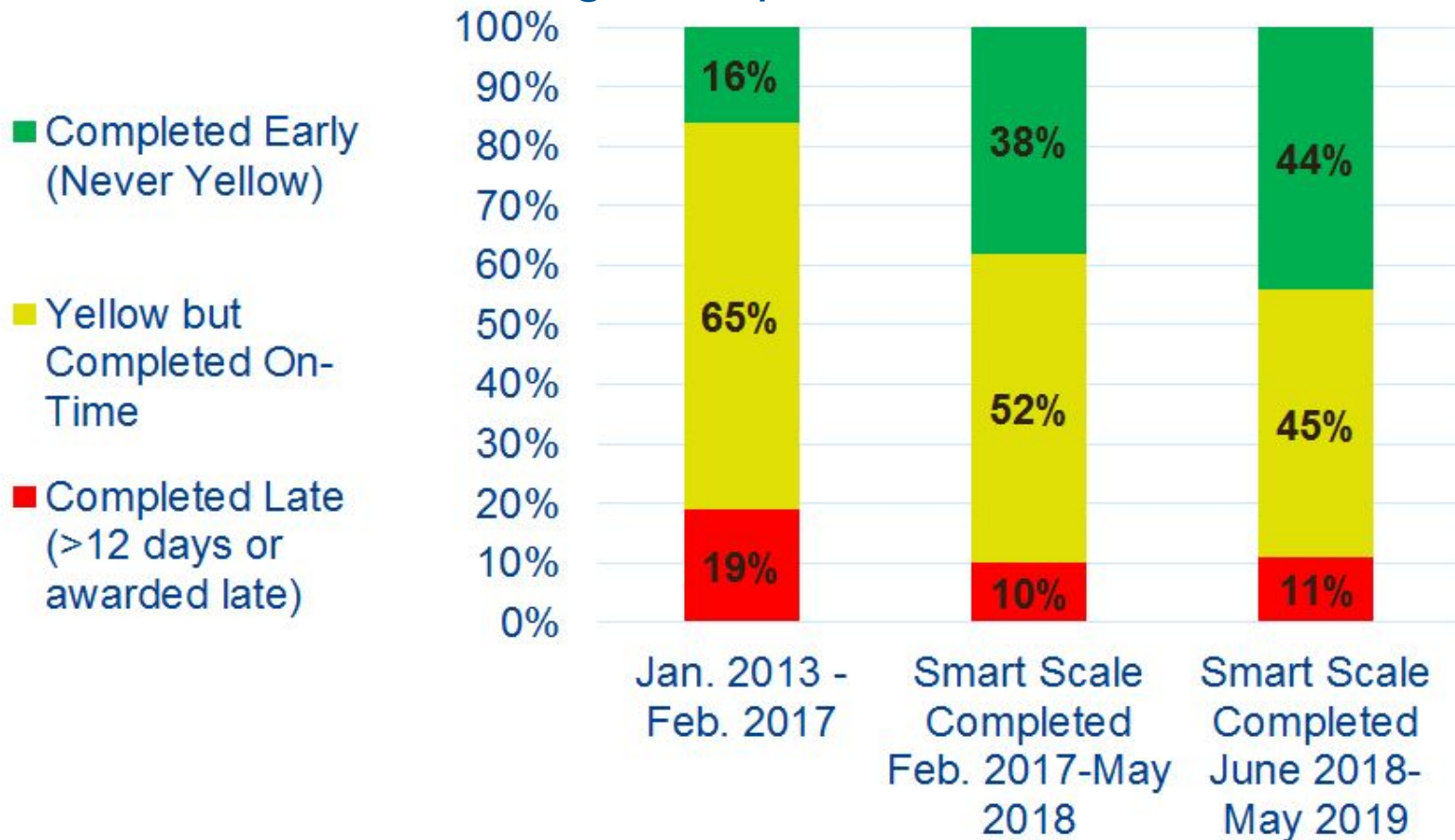


SMART SCALE Dashboard

Changing how we track performance



Impact of business rule changes on performance



SMART SCALE Dashboard

Changing how we track performance



- Impact of business rule changes on performance
- ## Project on Development Time - SMART SCALE

SMART SCALE projects
scheduled to award through
June 30, 2019

ADMIN BY	%ON TIME (OT)	#OT	\$OT	%ON BUDGET (OB)	#OB	\$OB	TOTAL PROJECTS	TOTAL BUDGET
Locally	48.0%	12	\$111.4 M	68.0%	17	\$221.7 M	25	\$340.8 M
VDOT	80.0%	44	\$1.22 B	74.5%	41	\$753.3 M	55	\$1.38 B
Total	70.0%	56	\$1.34 B	72.5%	58	\$971.0 M	80	\$1.72 B

- Milestones are being completed earlier but challenges to meeting established targets exist
- Localities awarded 48% of projects on-time (33% of award dollar value)
- VDOT awarded 80% of projects on-time (89% of the award dollar value)

SMART SCALE Dashboard

Changing how we track performance



- Impact of business rule changes on performance

Project Delivery - SMART SCALE

SMART SCALE projects scheduled to award through June 30, 2019

ADMIN BY	% ON TIME (OT)	# OT	\$ OT	% ON BUDGET (OB)	# OB	\$ OB	TOTAL CONTRACTS	TOTAL AWARD
Locally	57.1%	4	\$11.8 M	57.1%	4	\$11.8 M	7	\$87.8 M
VDOT	87.0%	20	\$176.5 M	82.6%	19	\$117.1 M	23	\$222.8 M
Total	80.0%	24	\$188.4 M	76.7%	23	\$128.9 M	30	\$310.5 M

- Localities completed 57% of projects on-time (13% of dollar value scheduled for completion)
- VDOT has completed 87% of projects on-time (79% of the dollar value scheduled for completion)

SMART Portal

Goodbye paper, hello web-based convenience



- Portal originally developed for SMART SCALE
- Due to positive feedback the Portal was expanded to other funding programs
- Just a few years ago we were still mailing paper applications
- One-stop shop
- Portal is now a repository of useful info - even for projects not funded

All submitted project applications will be subject to requirements of the Freedom of Information Act (FOIA).
If you need assistance with this site, send your requests to SmartPortal@CTB.Virginia.gov.

Performance-Based Planning and Programming



- Performance based programming
 - SMART SCALE
 - SGR
 - HSIP
- Performance Based Planning/Project Development
 - Philosophy
 - Rethinking how to solve transportation problems



Cost Matters

- SMART SCALE requires projects to be assessed based on benefits relative to cost
- Impact of this policy alone cannot be understated
- Incentive to be cost effective
- Official SMART SCALE Score is



Benefit

Requested \$

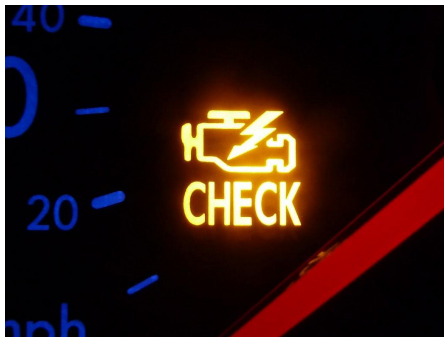
Performance-Based Planning



**SMART
SCALE**

*Funding the Right
Transportation Projects
in Virginia*

Does this decision
tree make sense?



New
Engine



New
Car



Performance-Based Planning



**SMART
SCALE**

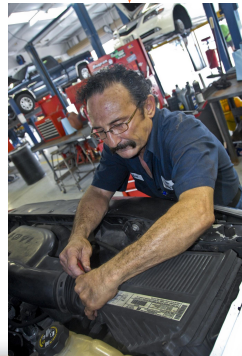
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Or is this more
logical...

Understand
the problem



Develop/Test
Solutions



Performance-Based Planning



Key Principles

- Identify need to address
- Consider options to preserve and improve existing transportation system
 - Operational improvements
 - Transportation demand management
 - Innovative intersection treatments
- If these are not able to address problem then consider projects that expand the system

Needs → Solutions



*Need in search of a solution as opposed
to solution in search of a need*

- Much more focus on process of developing and planning the solution be performance driven - to improve success in getting project funded
- More focused planning and project development is feeding better, more cost effective solutions into the project evaluation process
- Are there existing projects that need to be re-examined or re-scoped - is there a more cost-effective way to solve this problem?

Culpeper District Success Story

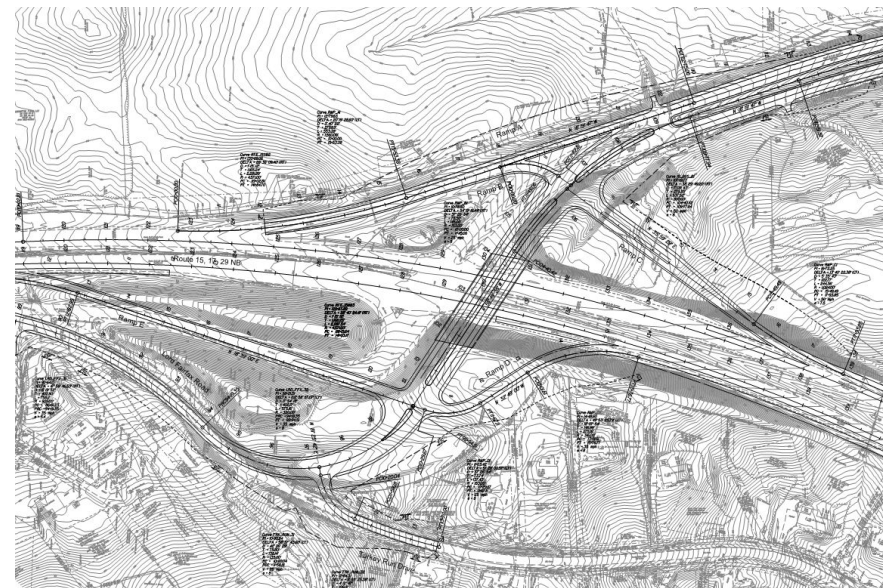
Case Study - Warrenton Southern Interchange



Round 1 Budget Reduction Success

- Initial project full diamond interchange with >\$45M estimate
- Significant Bridge Costs (5 Lane)
- Significant Width Ramps to accommodate volumes
- Project was selected but budget was reduced to \$27M - but still needed to maintain benefits

Warrenton Interchange Final Design



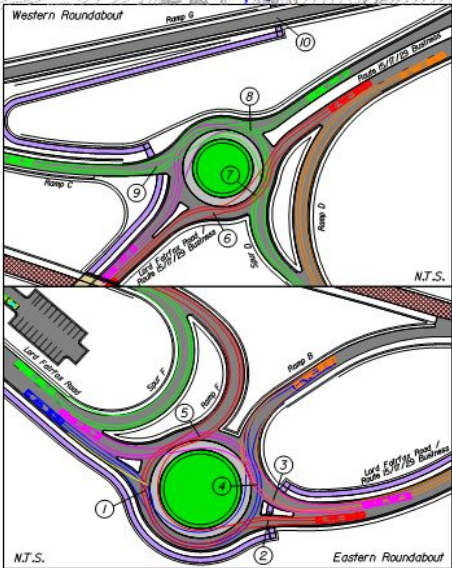
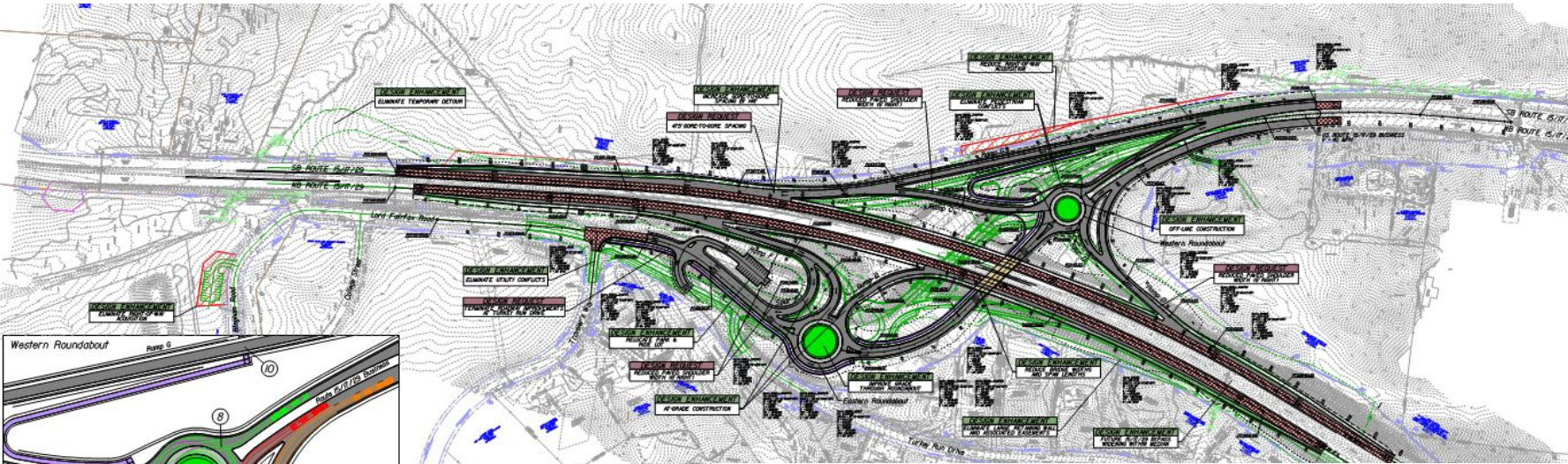
Culpeper District Success Story

Warrenton Southern Interchange



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Eastern Roundabout Level of Service, Delay (sec)	Western Roundabout Level of Service, Delay (sec)
AM Peak: B, 11.4	AM Peak: A, 6.5
PM Peak: A, 7.5	PM Peak: A, 4.4
SAT Peak: A, 9.6	SAT Peak: A, 4.7

- (See Operational Analysis Technical Memorandum)
- (X) Denotes Conflict Points
 - Denotes Proposed Full Depth Pavement
 - Denotes Proposed Bridge
 - Denotes Proposed Truck Apron
 - Denotes Proposed Central Island
 - Denotes Proposed Milling and Overlay or Variable Depth Overlay
 - Denotes Proposed Shared Use Path
 - Denotes Area of ROW Reduction
 - Denotes RFP Concept Plan
 - Denotes RFP Concept Plan Proposed Right-Of-Way
 - ⊂ Denotes Construction Limits In Cuts
 - ⊆ Denotes Construction Limits In Fills

- Roundabout terminals reduced bridge to 2 lanes, reduced grading for ramps
 - better long term level-of-service
 - improved safety and reduced maintenance costs
- Final cost anticipated to be \$23-25M
- \$47M → \$27M → \$23-25M

Warrenton Southern Interchange US 15/17/29
ATC 001 Modified Barbell Interchange Concept

Date: 10/25/2017
Scale: 1" = 100'

SCALE
1" = 100'

Strengthening the Planning Process



- Question: Would previous success been realized if project had been funded at full amount?
- Approach every transportation problem with goal to find the most cost-effective solutions
- Easy for local/regional decision makers or public to see innovation as:
 - Settling for a less than optimal project
 - ‘Bubblegum’ or ‘Band-aids’
- Performance-based programming processes must be fed by performance-based planning process

Route 7 - Route 9 to Dulles Greenway Case Study

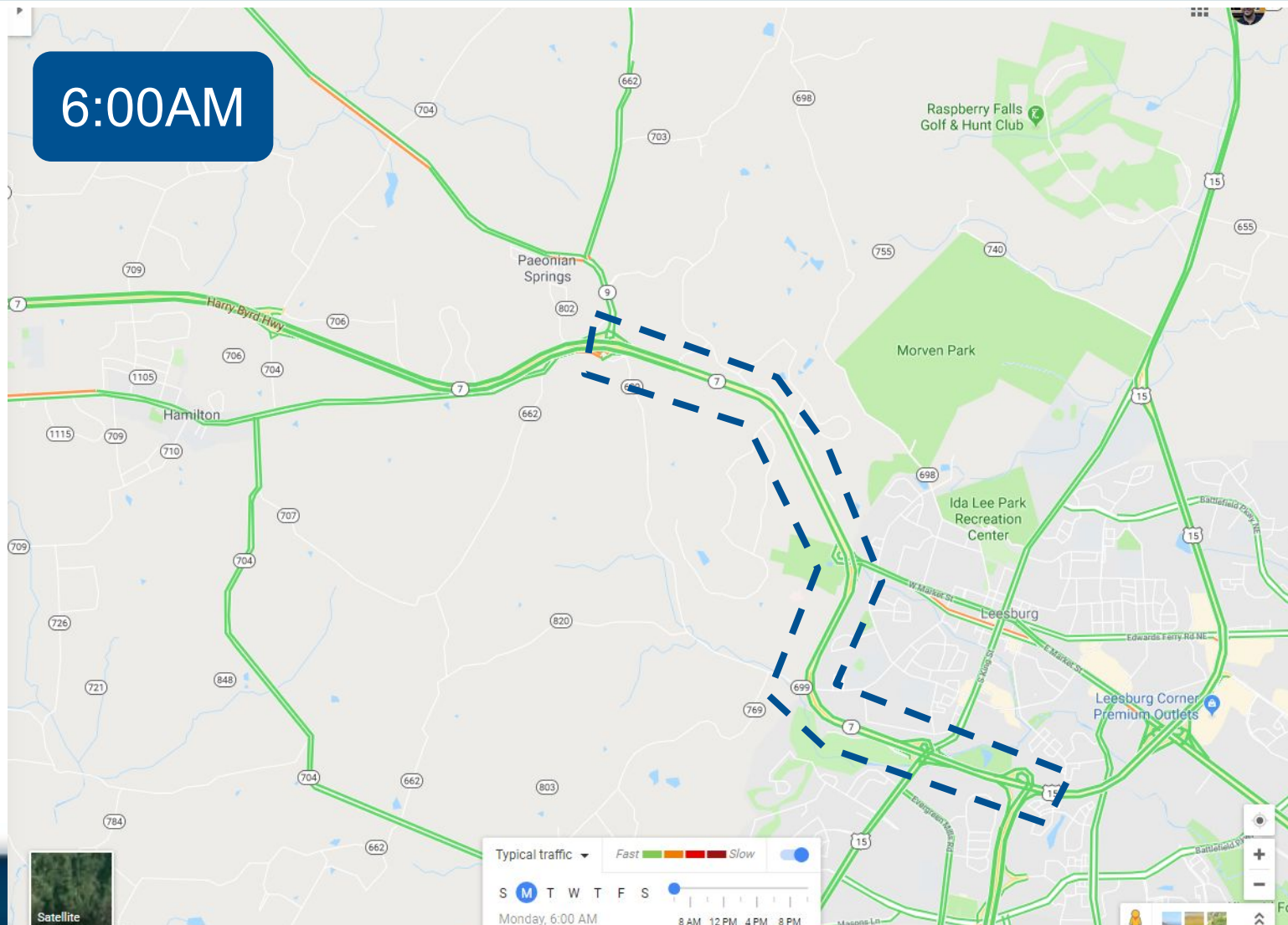


- STARS study was undertaken in 2017 to assess congestion and safety issues on Route 7 and to develop and analyze targeted improvements
- Preferred alternative from study recommended extension of acceleration lane onto EB Route 7 from NB route 9 by just under a mile
- Ramp extension would reduce friction through interchange as vehicles travel uphill and around a curve, reducing delay and mitigating sideswipe crashes
 - Also avoided costly RW and utility relocation

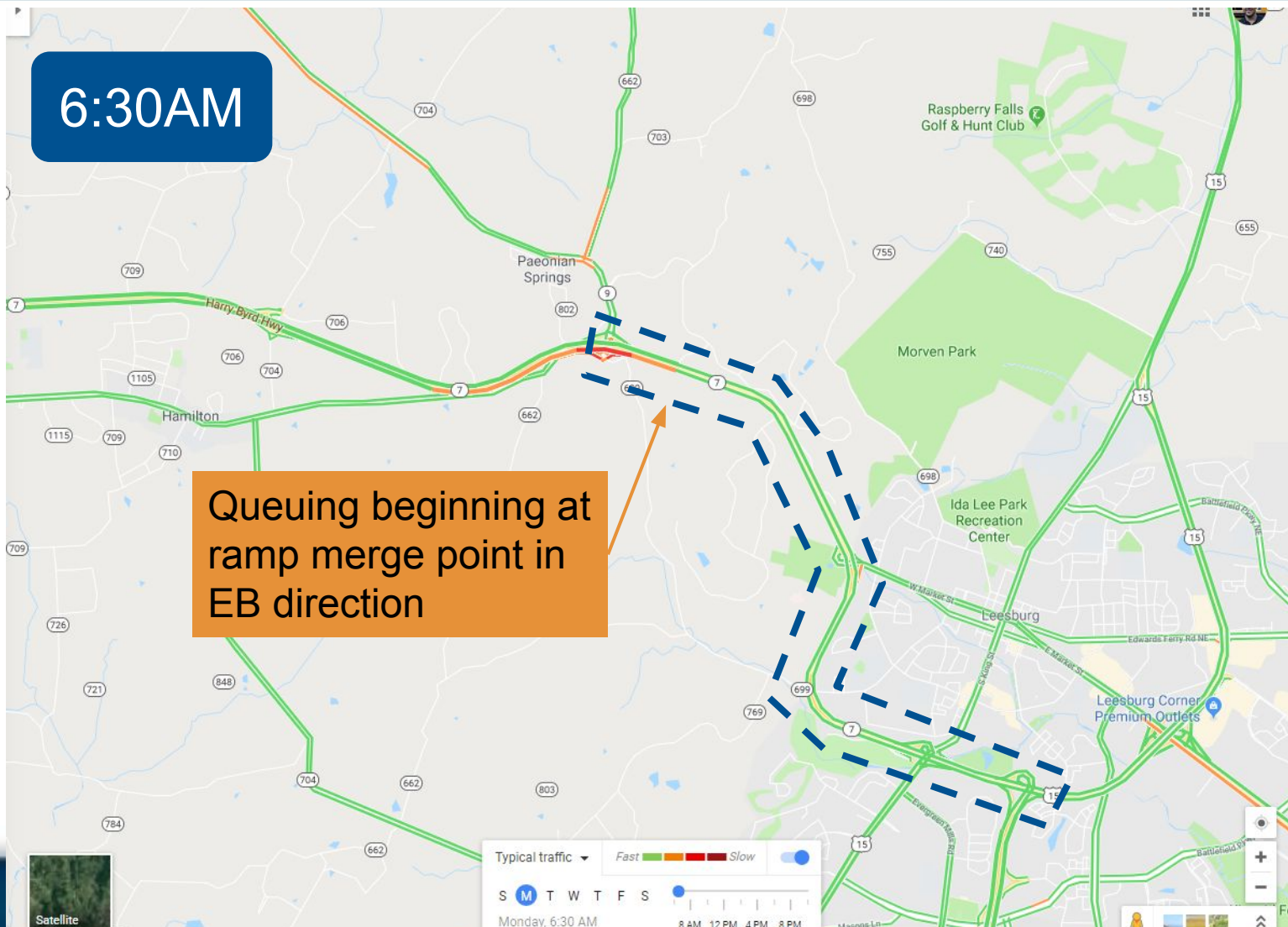
Route 7 - Route 9 to Dulles Greenway Morning Peak



6:00AM



Route 7 - Route 9 to Dulles Greenway Morning Peak

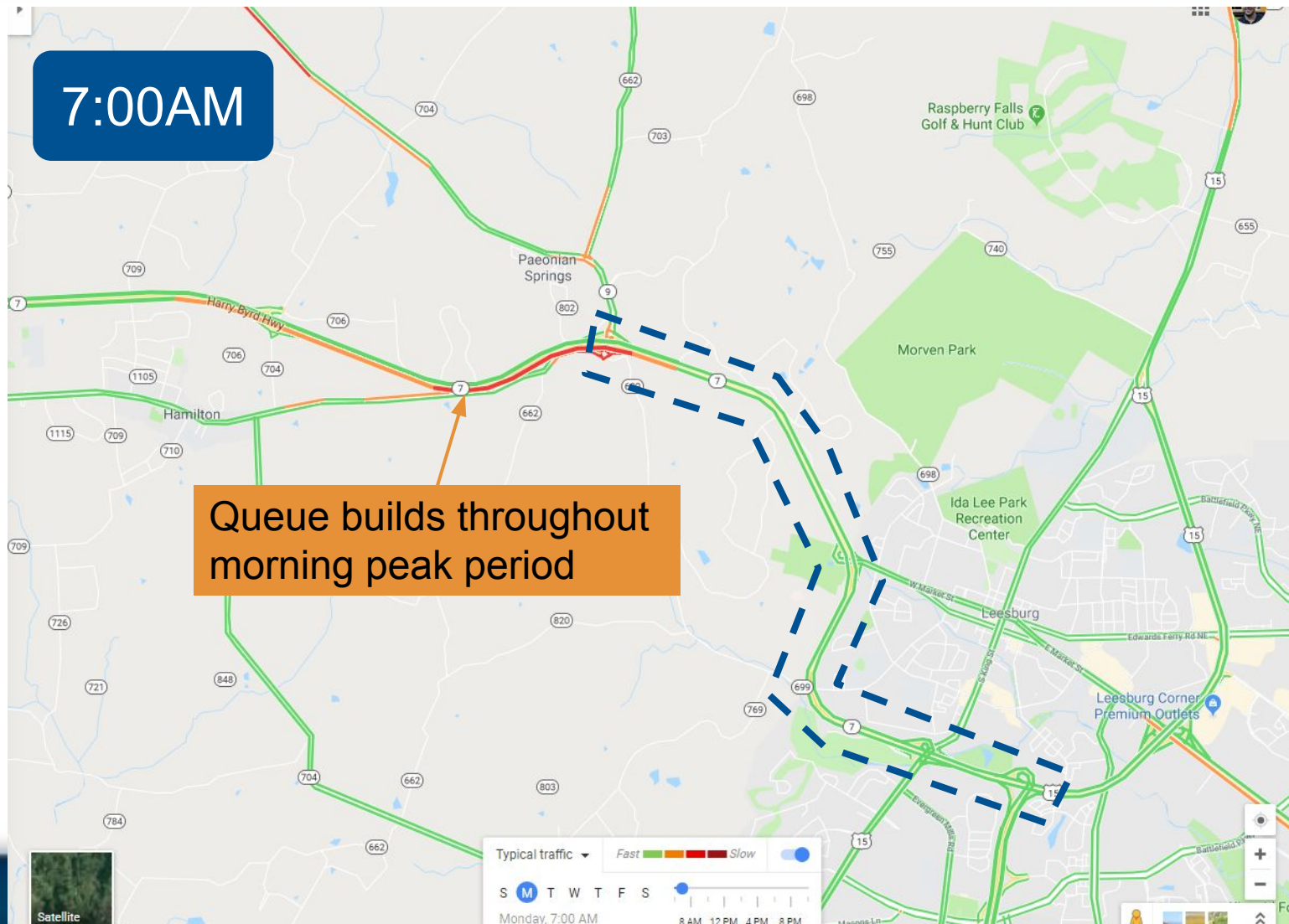


Route 7 - Route 9 to Dulles Greenway Morning Peak

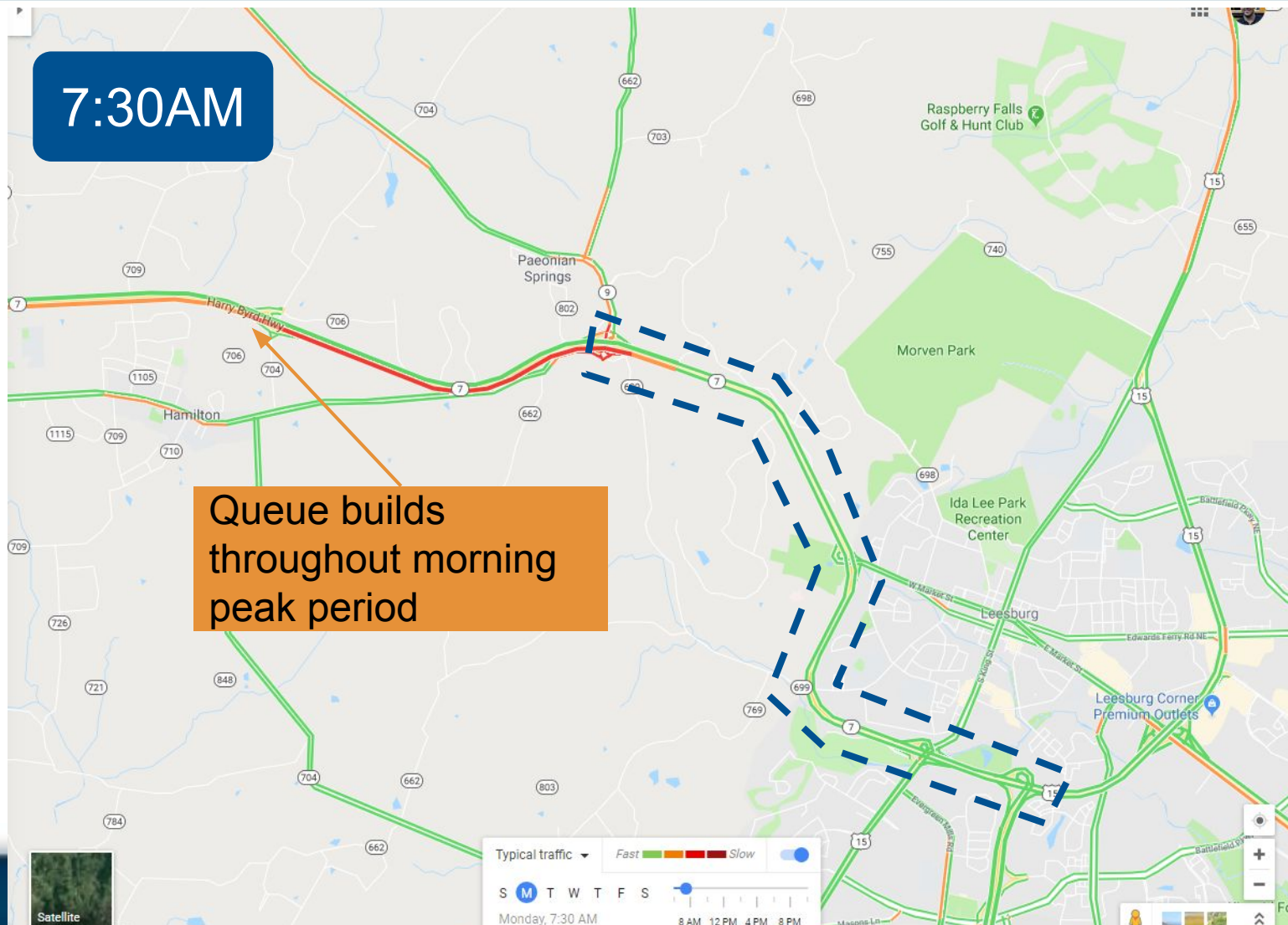


SMART SCALE

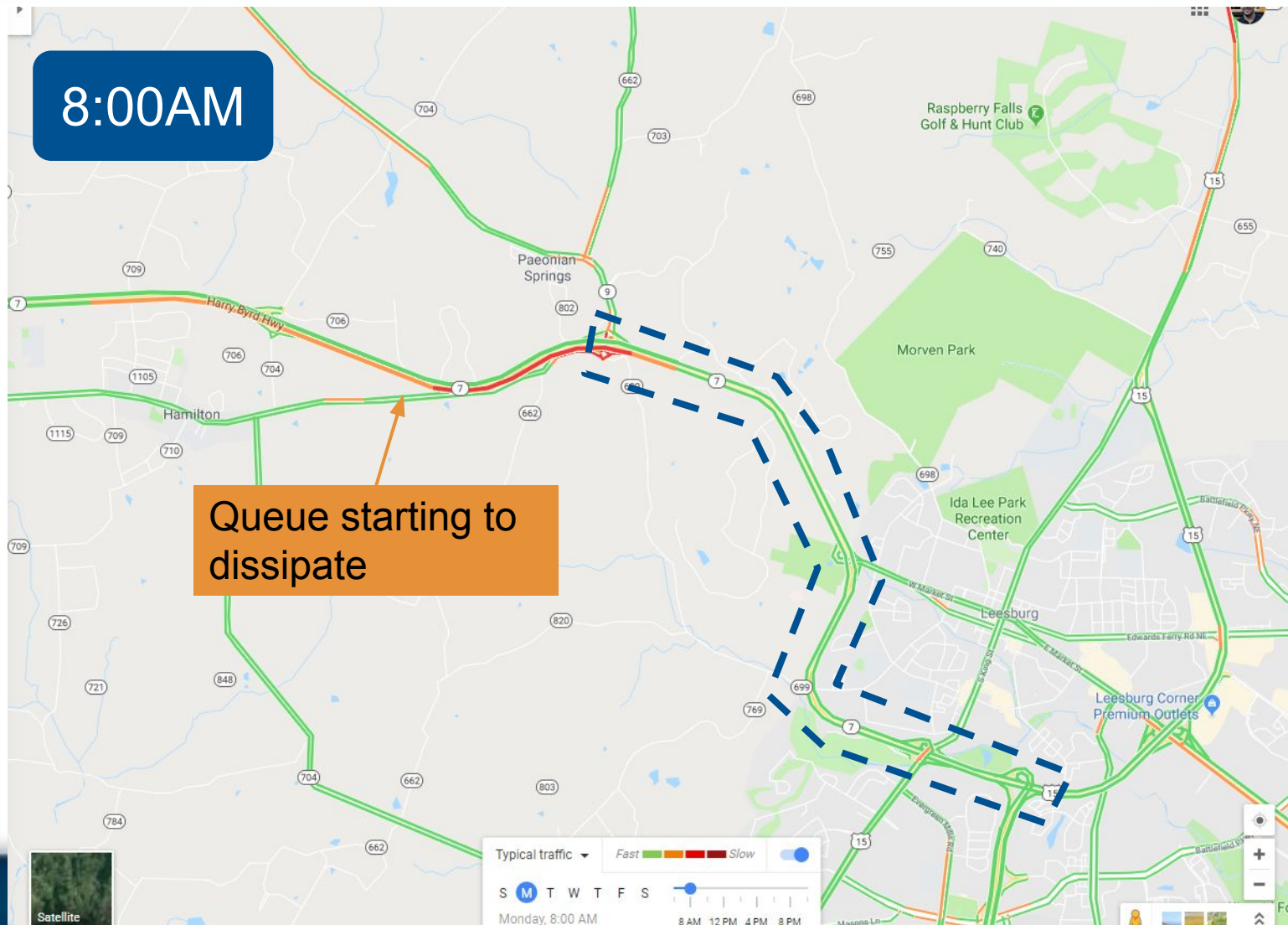
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Route 7 - Route 9 to Dulles Greenway Morning Peak



Route 7 - Route 9 to Dulles Greenway Morning Peak

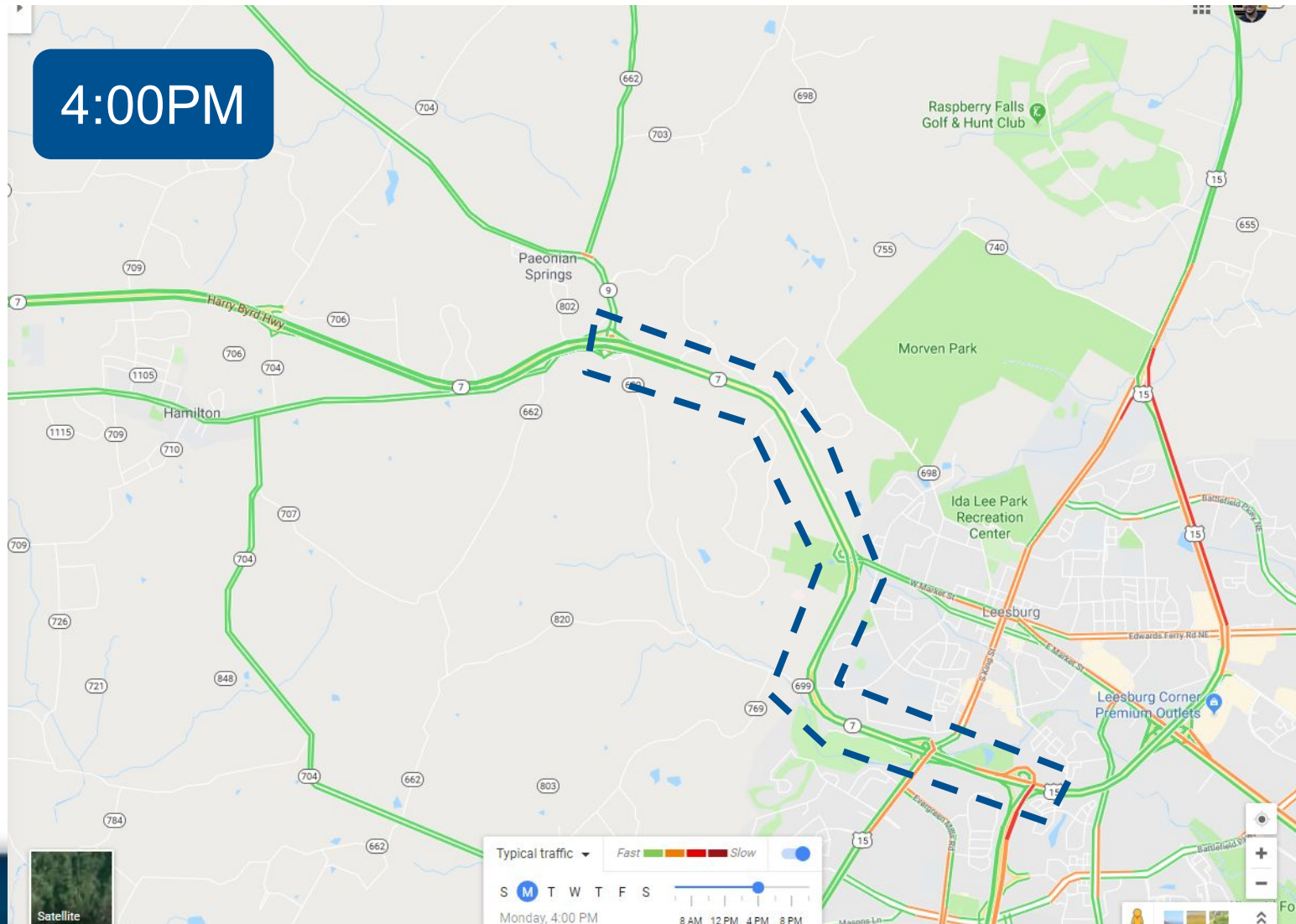


Route 7 - Route 9 to Dulles Greenway Evening Peak



SMART SCALE

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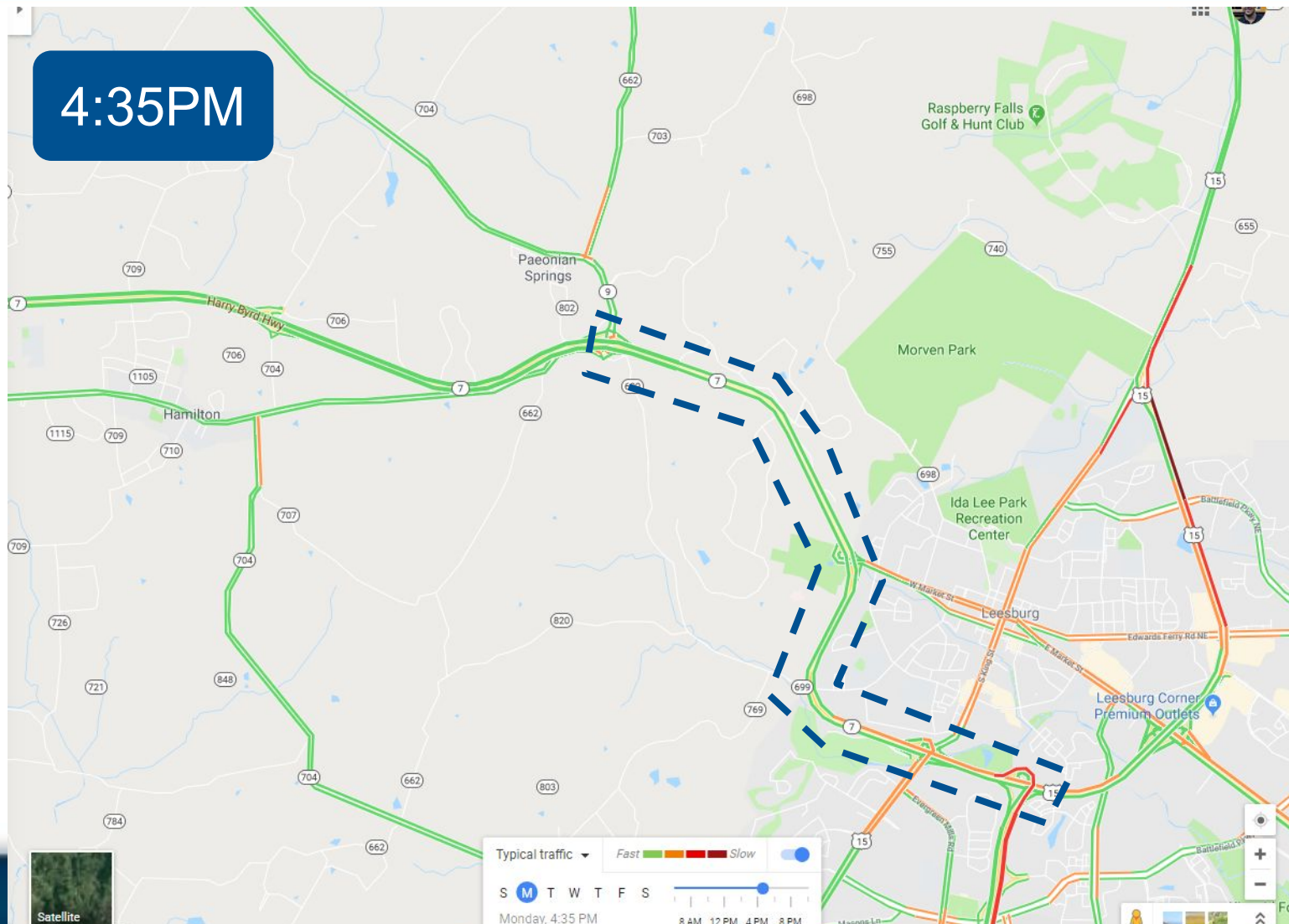


Route 7 - Route 9 to Dulles Greenway Evening Peak



SMART SCALE

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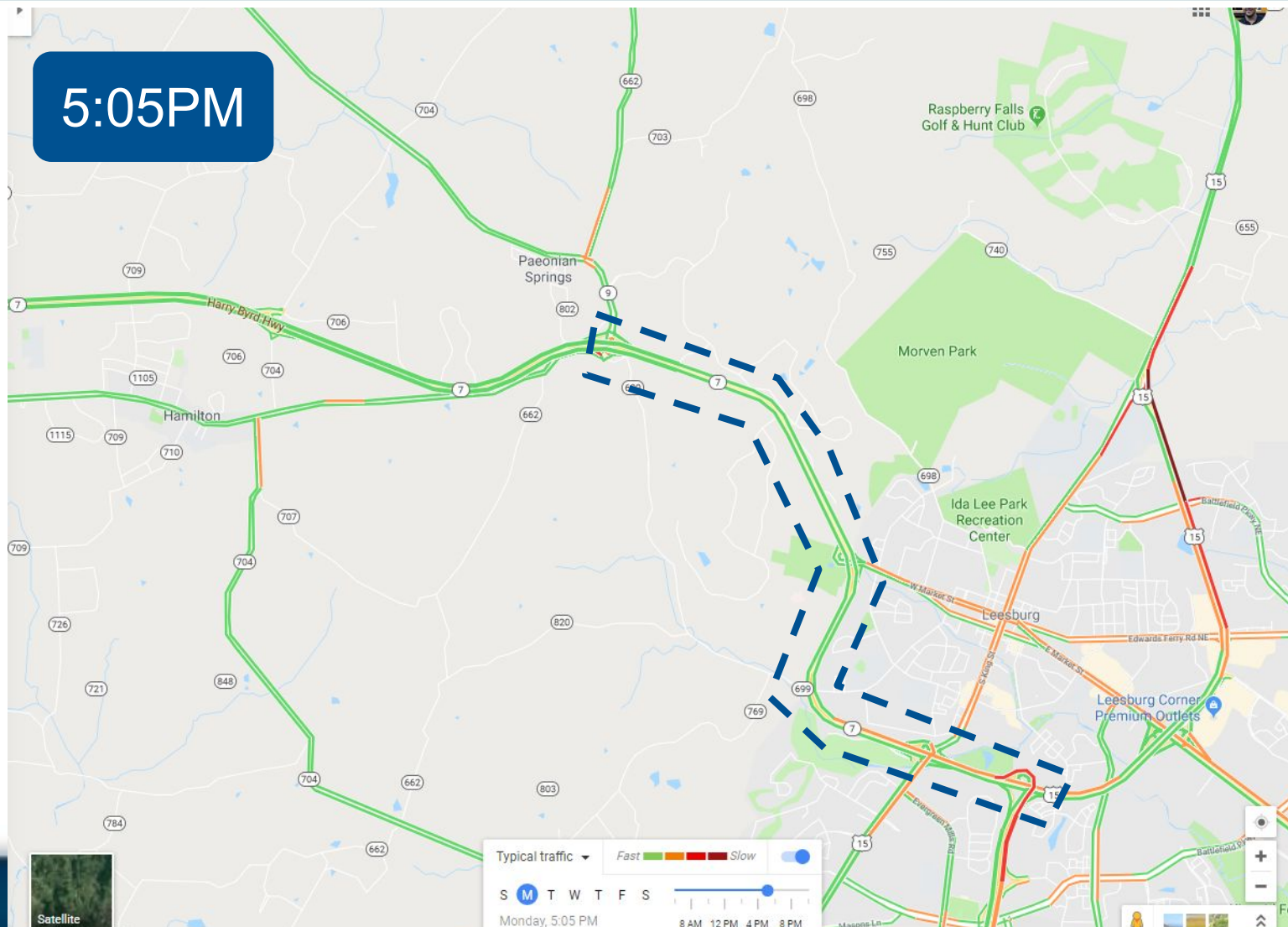


Route 7 - Route 9 to Dulles Greenway Evening Peak



SMART SCALE

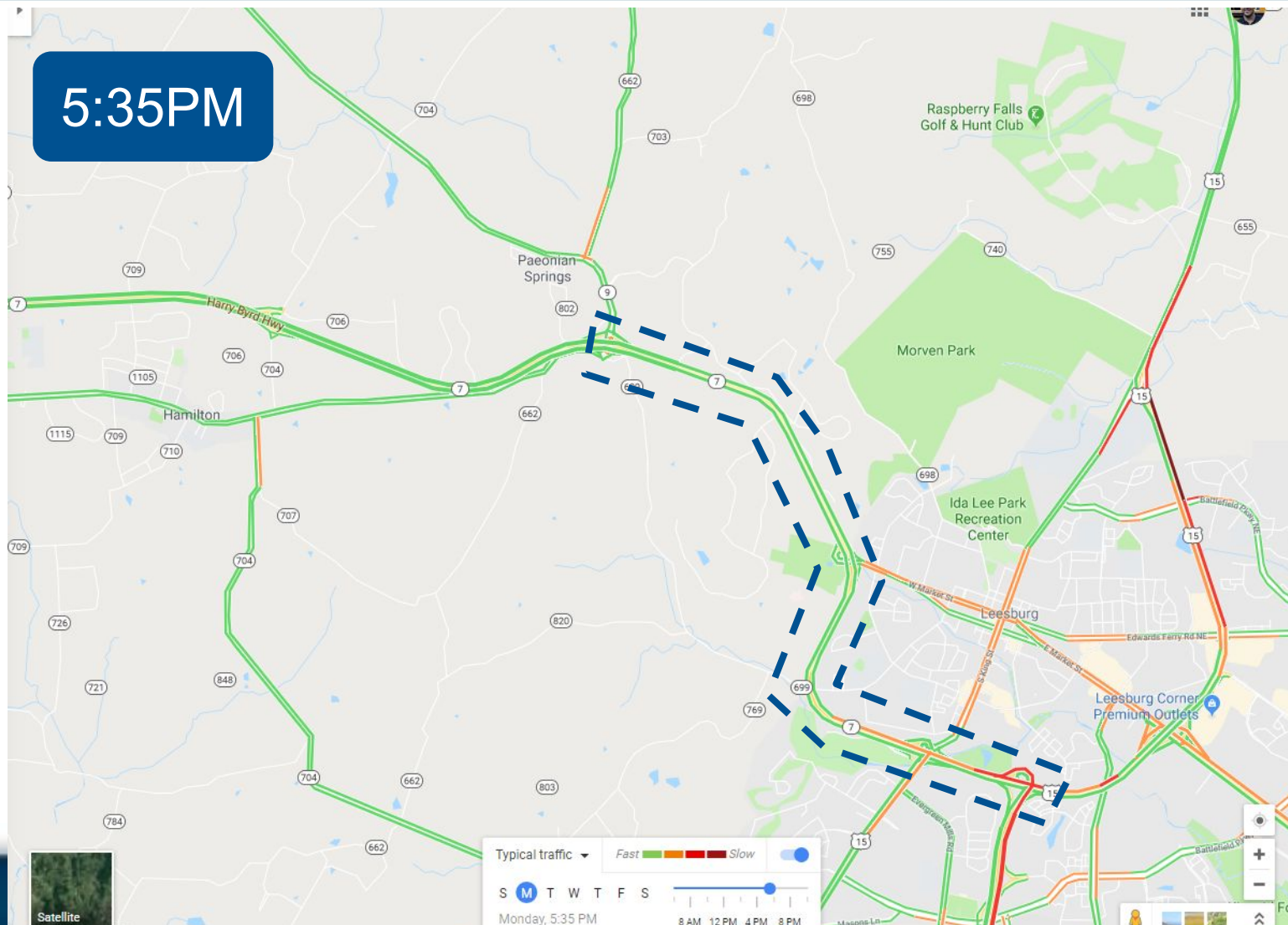
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Route 7 - Route 9 to Dulles Greenway Evening Peak



5:35PM

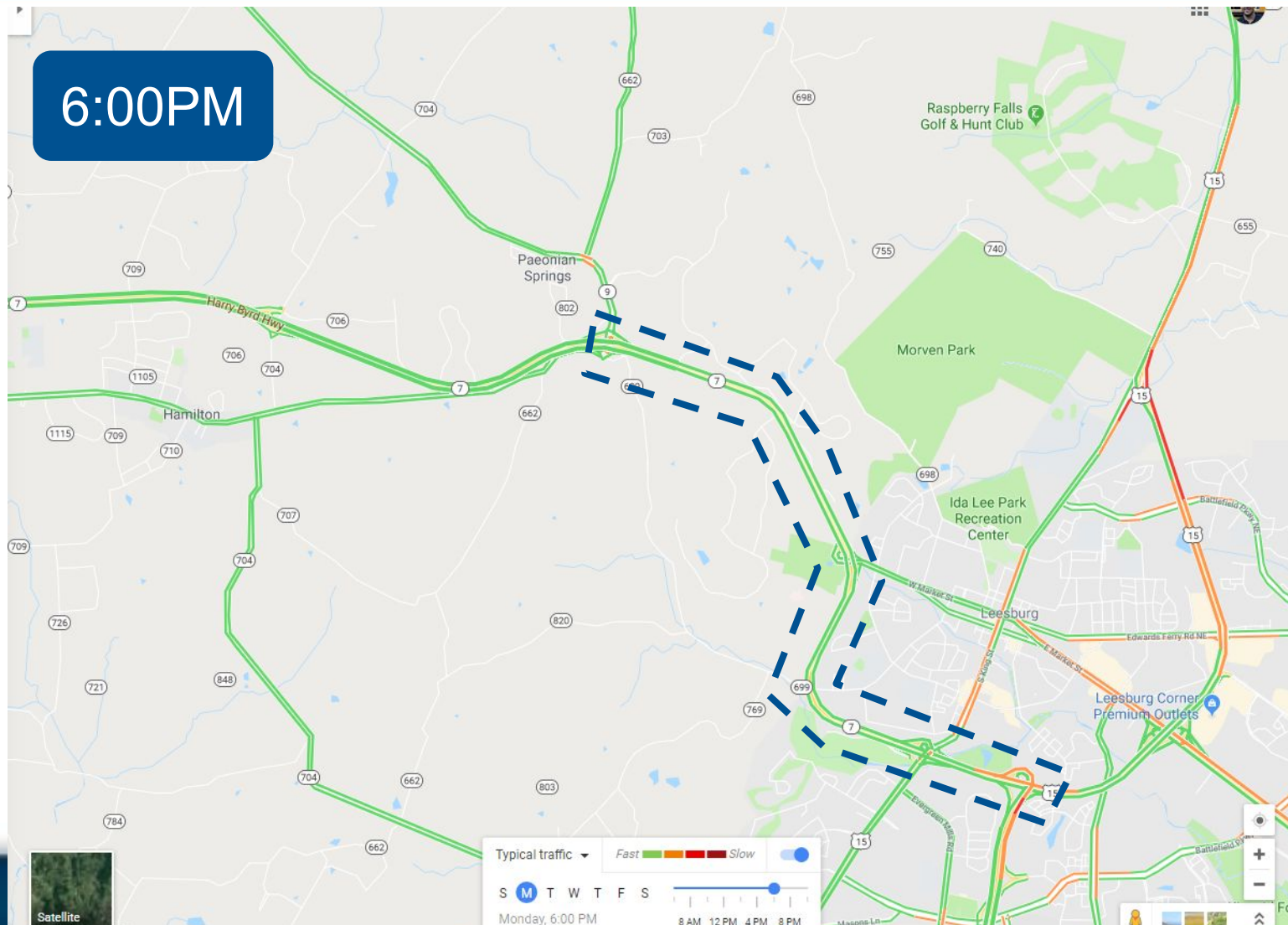


Route 7 - Route 9 to Dulles Greenway Evening Peak



SMART SCALE

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Route 7 - Route 9 to Dulles Greenway



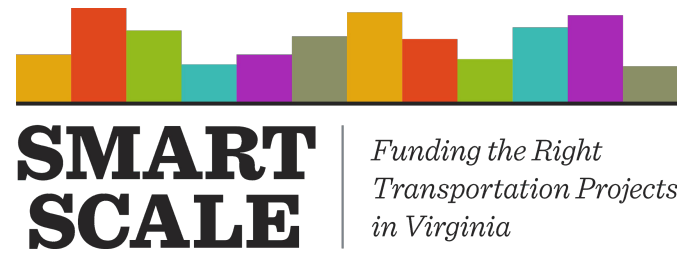
Need/Problem	EB congestion in morning peak at the Route 9 interchange due to friction through this interchange as vehicles merge while traveling uphill and around a curve	
Solution	Round 3 Submitted Project	Recommendation from STARS Study
Scope of Work	Widen 6.5 miles of Route 7 in both directions between Dulles GW and W Market Street	Extend acceleration lane onto Route 7 EB from Route 9 by 4850 feet
Cost	\$127,000,000	\$16,600,000 (13%)
Benefit Points	4.66	2.71 (58%)
SMART SCALE SCORE	0.37	1.63 (440%)

Implications related to Performance Based Planning



- There are instances where more cost effective solutions to a need have been identified but have not been submitted
- May want to consider mechanism for sharing such instances with impacted CTB members
- Is there opportunity for VDOT to work with localities in-between cycles to determine whether there are more cost effective solutions to a need?

If at first you don't succeed...



- Each round of SMART SCALE is unique
- Scorecard shows applicant where project was strong and weak
- State works with applicants to look for ways to improve project and project applications that were not successful
- Many examples of successful resubmissions

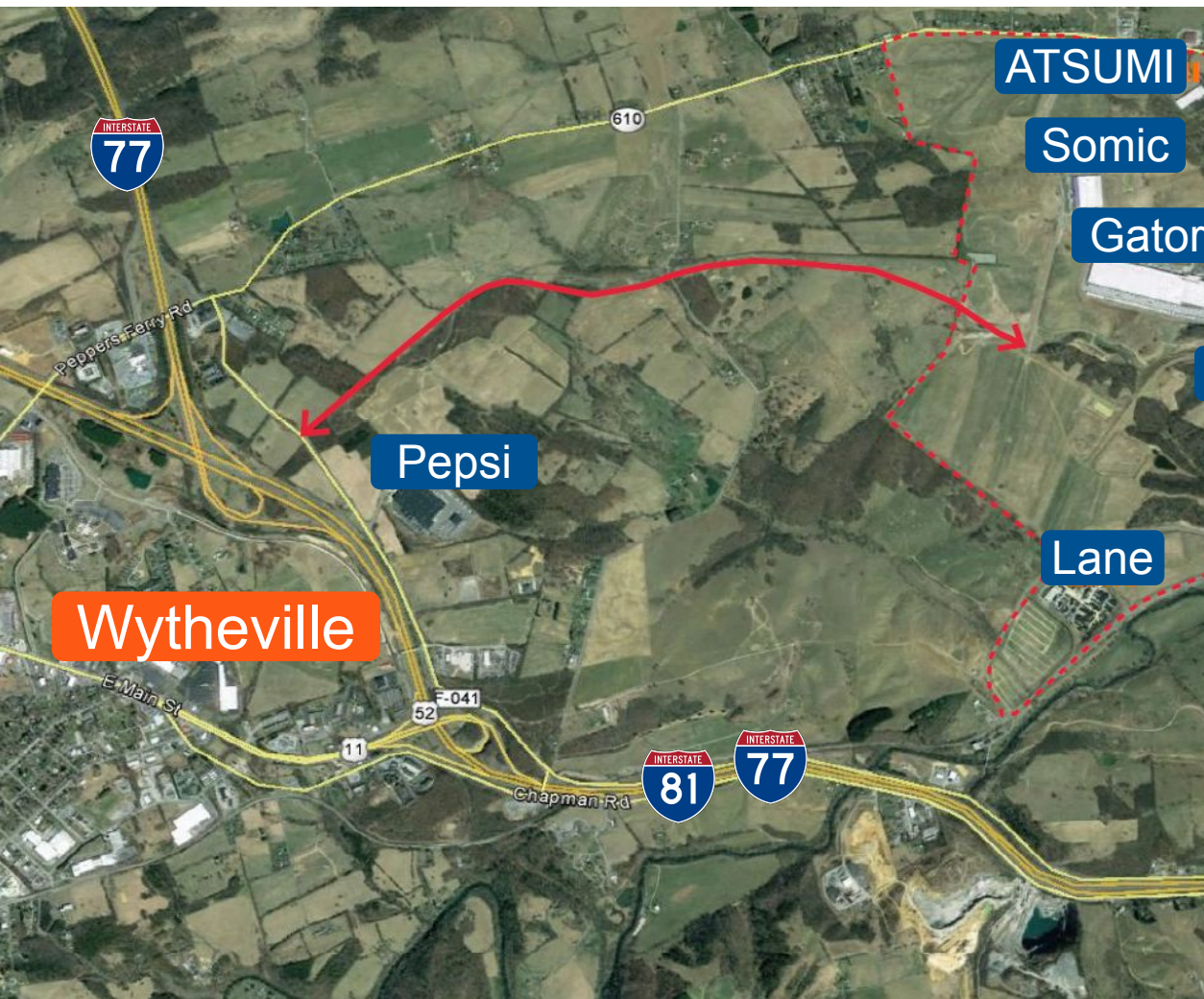
Bristol District Success

Progress Park Connector Road



SMART SCALE

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Bristol District Success Story

Progress Park Connector Road



- Round 2
 - \$20M project
 - \$17.7M SMART SCALE Request
 - No economic development sites included in application
 - One of lowest scoring projects statewide - zero points for economic development
- Round 3
 - \$23.6M project
 - \$10.8 Revenue Sharing leverage
 - \$12.8M SMART SCALE Request
 - 12 economic development sites included
 - 2nd highest scoring project in state for economic development site support
 - Partnering (Wythe County and VDOT) – early and open communications with continued education on SMART SCALE

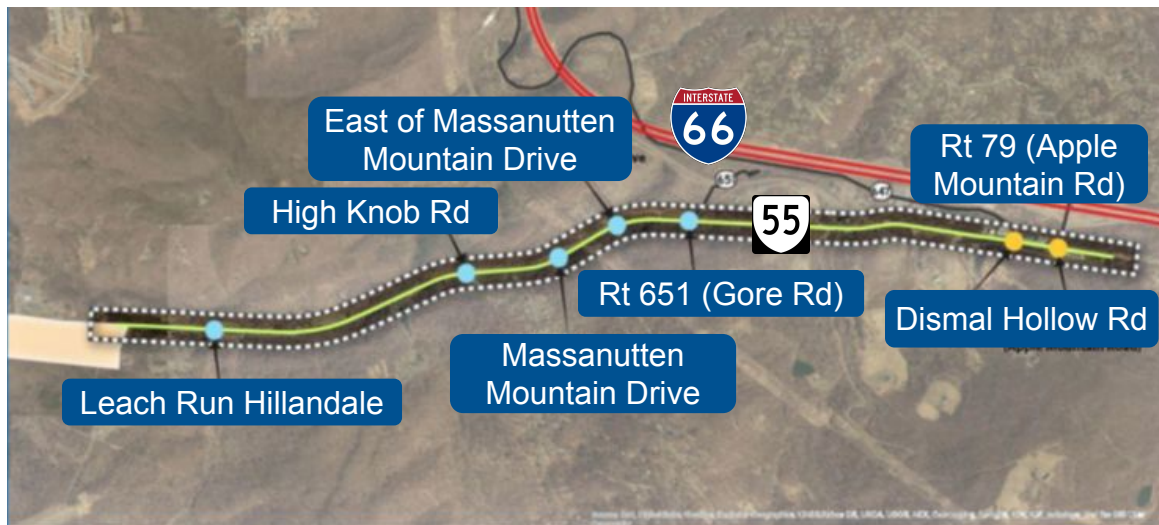
Staunton District Success

Route 55 East/John Marshall Highway



Existing Conditions

- Poor pavement markings
- Need for signage upgrades
- Sight distance issues
- Deficient traffic control elements
- Rear-end/Fixed object off-road crashes
- 121 crashes over 5-year period
- Localized congestion at Rt 79 intersection only



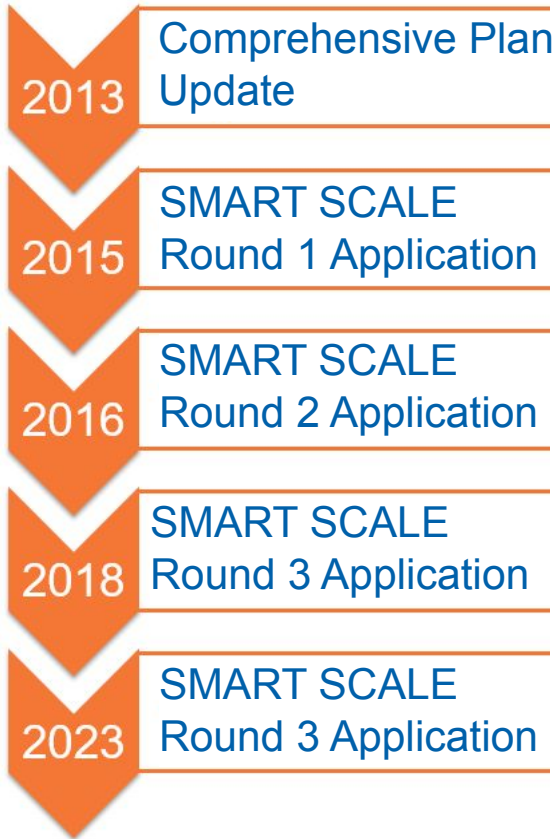
Staunton District Success

Route 55 East/John Marshall Highway



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Rounds 1 and 2

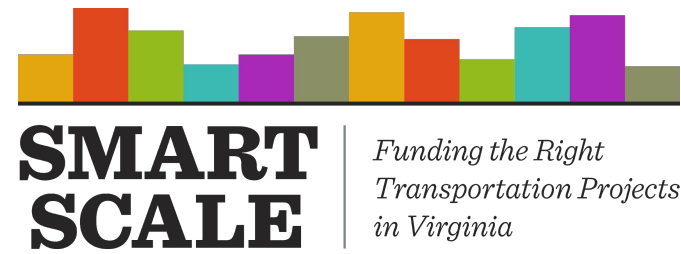
- Widen to 4-lane divided
- \$24-32 million
- Benefit points less than 1
- SMART SCALE score <0.5
- Near bottom in District rankings

Round 3

- Added targeted spot safety improvements
- \$1.6 million
- Benefit points > 4
- SMART SCALE score > 25
- 3rd highest ranked project in district

- Rumble strips
- Raised pavement markings
- Guardrail improvements
- Sign improvements
- Speed feedback signage
- Variable message boards
- Fixed object removal

Proactive Planning and Innovative Solutions



- With a regular 2-year cycle and an established process and measures SMART SCALE encourages state and local/regional partners to be more proactive in project planning/development
- State is providing performance measures and mapping data to help applicants identify locations with congestion, safety and reliability problems - locations that have better chance of scoring points
- With cost as an important variable there is incentive to look for cost effective ways to solve problems

F'burg District Success

Proactive plan for 95/301 Corridors



Interstate 95

North of Richmond Area to Baltimore

Current Travel Times (Uncongested)

- I-95 (entire distance)
140 Miles, 2 hours 14 min
- I-95 → I-495 → I-95
133 Miles, 2 hours 3 min
- I-95 → I-295 → B-W Pkwy → I-895 → I-95
126 Miles, 2 hours 1 min
- I-95 → B-W Pkwy → I-895 → I-95
126 Miles, 2 hours 0 min



F'burg District Success

Proactive plan for Route 301 Corridor



Route 207/301

North of Richmond Area to Baltimore

Current Travel Times (Uncongested)

- Rte 207 → Rte 301 → Rte 5 → I-95 → Rte 5 → B-W Pkwy → I-895 → I-95
129 Miles, 2 hours 16 min
- Rte 207 → Rte 301 → Rte 3 → I-97 → I-895 → I-95
124 Miles, 2 hours 19 min

Currently, taking the Route 207/301 alternative is only a few minutes longer than taking any one of the I-95 alternatives



F'burg District Success

Proactive plan for Route 301 Corridor



- **Developed an Arterial Management Plan for the corridor**
 - Increased travel due to widening of Nice Bridge to 4 lanes from current 2 lanes
 - Ability to divert 95 traffic – cost effective means of reducing congestion on I-95 - particularly on weekends
- **Identified innovative, low-cost improvements to improve safety and decrease congestion**
 - Continuous Green-T Intersections - 5 locations
 - Restricted Crossing U-Turn Intersections - 4 locations
 - Median U-Turn Intersections - 2 locations
 - Quadrant Roadway Intersections - 3 locations

Salem District Success

Project Development



- Of 10 projects in final funding scenario for Salem six originated from Arterial Management Plans (AMP) or local planning initiatives
- SMART SCALE provides an objective measure based process that benefits targeted safety and operational improvements
- Plan your work, then work your plan

Successful Planning Projects

- Route 220 at Route 619 Improvements (Route 220 AMP)
- Route 220 at Route 919 Improvements (Route 220 AMP)
- Route 220 at International Parkway Intersection (stand alone AMP)
- Route 122 at Route 636 Improvements (UDA/local planning effort)
- Route 419 & Route 220 Diverging Diamond Interchange (local planning effort with VDOT assistance)
- Route 697 at US Route 460 Intersection (Route 460 APP)

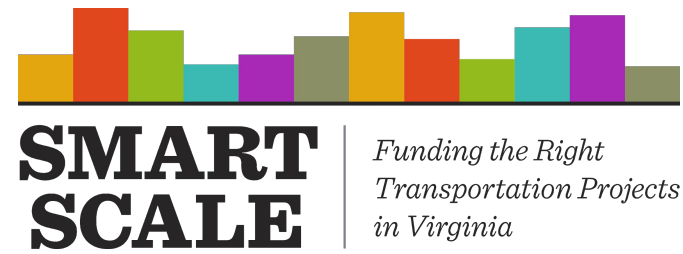
Flexibility of SMART SCALE process

CTB discretion in selecting projects



- **Bristol - Smyth County**
 - US Route 11 / SR 660 Roundabout South swapped out and replaced with US Route 11 / SR 660 Roundabout North
 - Project costs almost identical - north roundabout would improve safety near school
- **Fredericksburg - City of Fredericksburg**
 - Project to implement operational improvements along Route 3 swapped out with variation that also included ramp improvements at the I-95/Rt 3 interchange
- **Staunton - Interchange Improvements on I-81 at Exits 247 and 313**
 - Based on updated DGP/HPP amounts in Rd 3
 - Supplements SGR funded bridge projects now, to add much needed capacity improvements, which provides significant future cost savings.

Programmatic Budgetary Performance



- **\$2.4 Billion allocated in Rounds 1 and 2**
 - Over 300 projects selected for funding
- **\$77 million in cost savings based on Construction Award**
- **\$75 million re-allocated to cover cost increases**
 - 80% of cost increases on 2 projects (Rte 7, Laskin Rd)
 - Cost increases represent only 3% of funds allocated in Rounds 1 and 2
- **Reinforces need to consider programmatic success when reviewing future individual project cost increases**



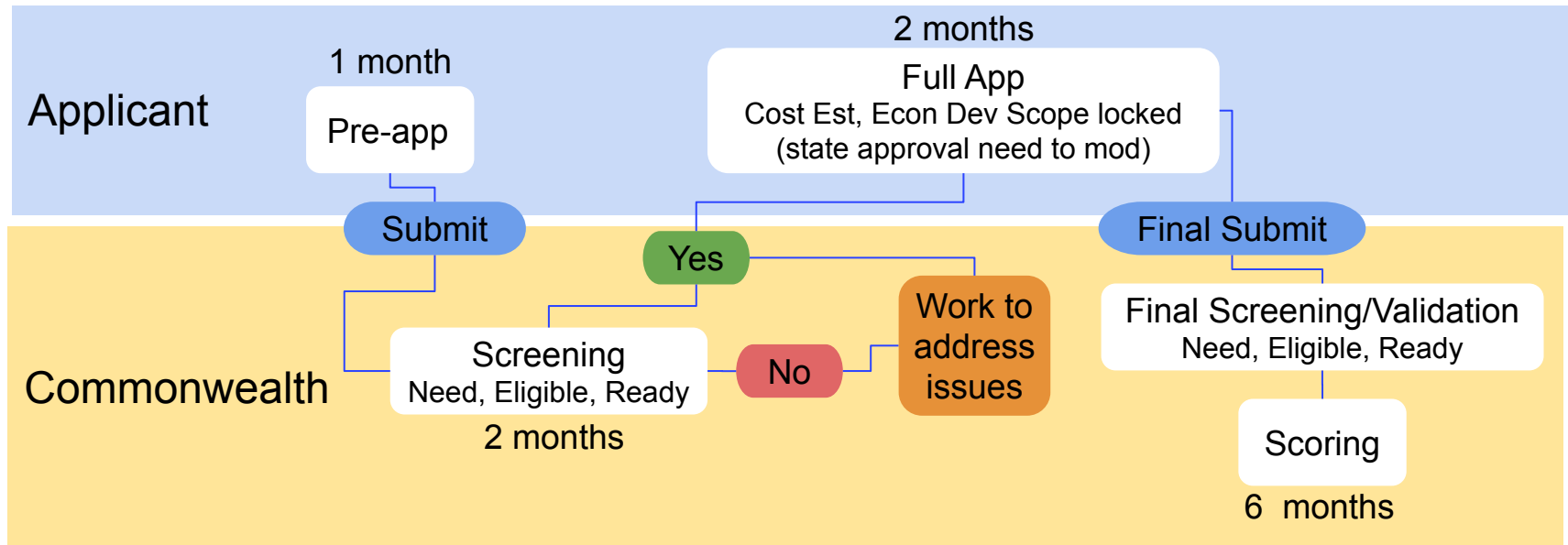
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Application Intake, Validation and Screening

Intake Schedule

- Round 3 saw implementation of pre-application
- Very helpful, but after applicant submitted pre-app they could immediately start in full-app - often completely changing the project
- State was pre-screening a moving target - for this reason we will be recommending the hand-off approach shown below:



Screening and Validation



- Per CTB policy there are three key screening decisions:
 - Does the project meet a ***VTrans need?***
 - Corridors of Statewide Significance
 - Regional Network
 - Urban Development Area (UDA)
 - Safety
 - Is the project ***eligible*** for SMART SCALE?
 - Not allowed - studies, state of good repair
 - Is the project ***ready?***
 - Clear scope of work
 - Met planning and public involvement requirements

Screening and Validation



- Validation process is an accuracy and/or reasonableness review of data and information in the project application
- Lead by multi-disciplinary teams at DRPT and VDOT (District and CO)
- Focus areas
 - Scope of work and project features
 - Economic development sites
 - Cost estimate and schedule
 - Supporting documents
- Validation process helps ensure fairness and minimizes risks

Project Eligibility



- After previous rounds the Board has adopted policy language to clarify eligibility/ineligibility
- Two project areas to discuss from an eligibility standpoint:
 - Transit Maintenance Facilities
 - System-wide Investments

Transit Maintenance Facilities



- Rationale in favor of inclusion is that maintenance facilities or facility expansion may be needed to facilitate service or capacity expansion
- Concern this is a gray area and additional rules may be needed to avoid future problems
- Potential options
 - Only allow as part of a larger bus or rail capacity expansion
 - Limit eligibility to capital projects that (1) demonstrate expanded transit or rail capacity and (2) provide a direct benefit to transit passengers (station improvements, bus stop features, etc).

Area-wide Investments



- These are improvements that do not have a typical from/to and often cover a larger geographic area
- Some example from previous rounds include:
 - NOVA Regional Mobility Program- integrated, multimodal, technology-based approach to mobility and congestion management for NOVA region
 - Multi-corridor or jurisdiction-wide implementation of adaptive signal controllers
 - Countywide bus stop upgrades
- Expansive scope and multi-faceted nature of improvements present challenges for scoring and validation

Project Readiness



- Project readiness is critical to minimize risks for major scope changes and cost overruns
- Ability to estimate benefits and score a project is dependent on clear and concise scope of work
- Key points scope should address
 - What - what is being proposed
 - Where - location of each improvement
 - How much - measurement (length, width, #)
- Initial pre-applications often lack adequate detail
- Coordination to resolve details = time/resources

Project Readiness



- Board has strengthened incrementally each round
- Much of the strengthened policies have focused on highway investments - requiring alternative analysis and planning studies
- Similar policy provisions should be considered for major transit capital investments such as BRT and light rail
- Show planning study with alternatives considered
- Projects are included in agency's Transit Strategic/Development Plan



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Round 3 Project Evaluation and Scoring

Round 3 Observations

- Safety, Economic Development, and Land Use were the most influential factor areas in round 3

Factor Area	% of Total Benefit Points with HRBT	% of Total Benefit Points without HRBT
Congestion	9.5%	25.8%
Safety	31.7%	23.9%
Accessibility	5.2%	7.3%
Environmental	16.1%	12%
Economic Development	18.8%	17%
Land Use	18.6%	13.9%



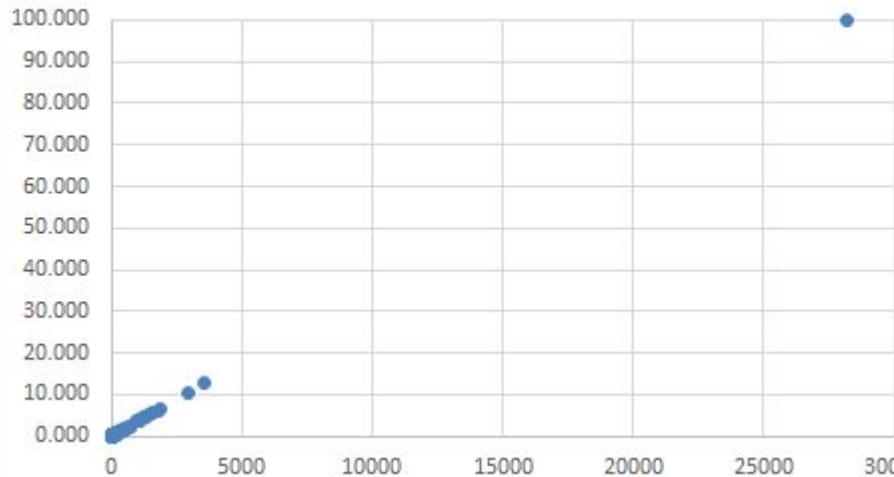
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Round 3 Observations

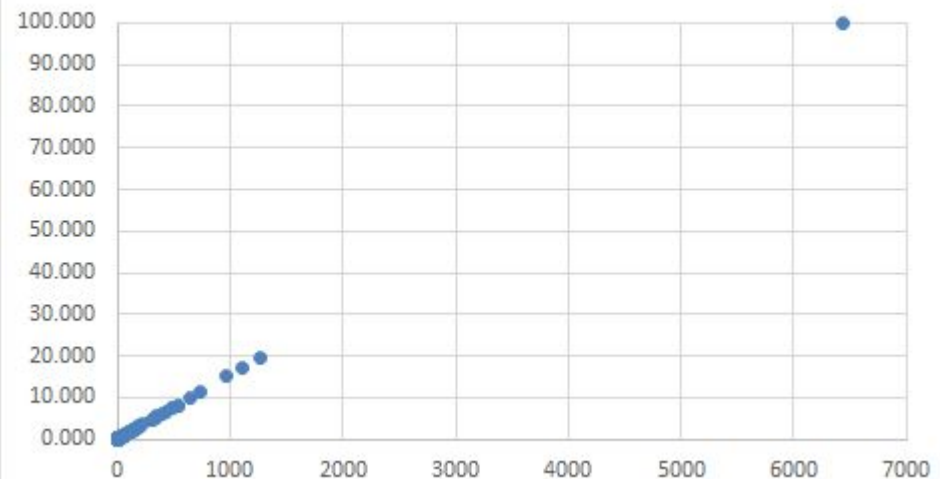
- Why did congestion not compare similar to safety, economic development and land-use? Distribution of values in the normalization process

Throughput Score (Measures)



For both C1 and C2 the values are skewed toward lower end of 0-100 scoring range

Delay Score (Measures)



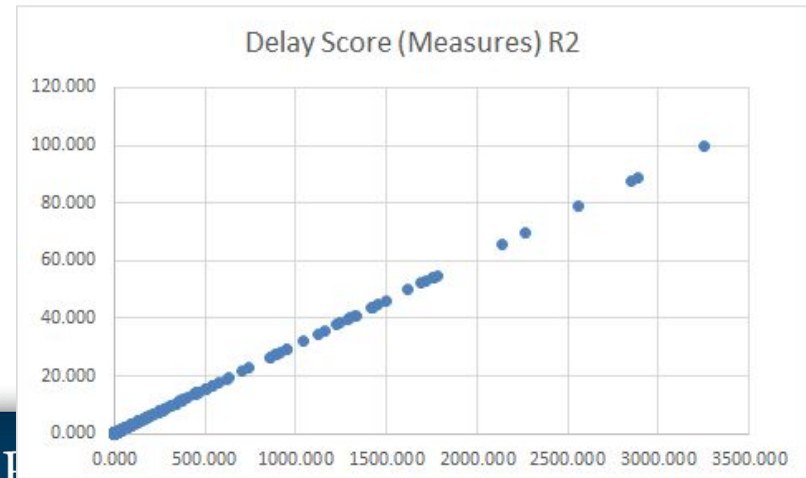
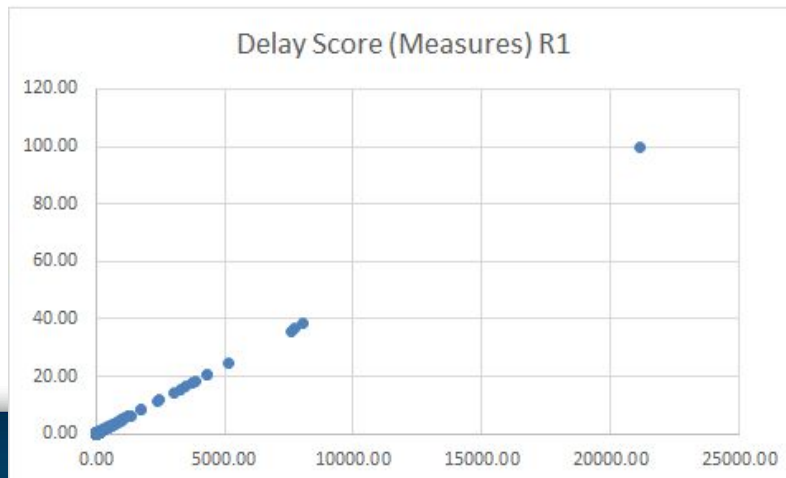
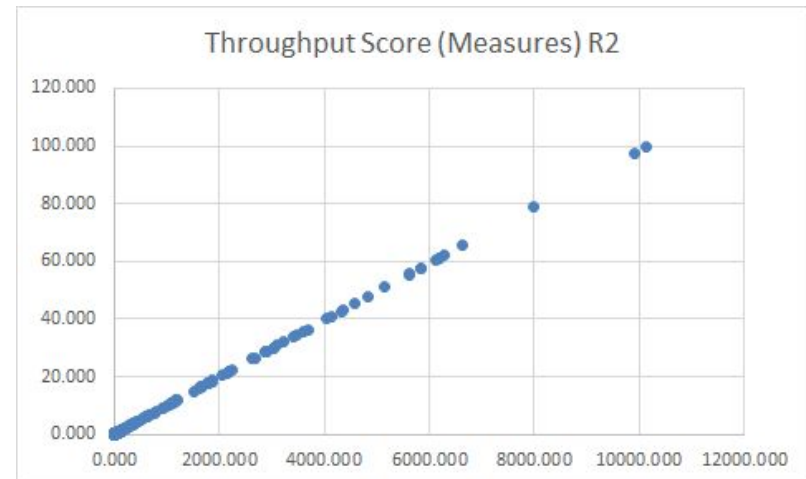
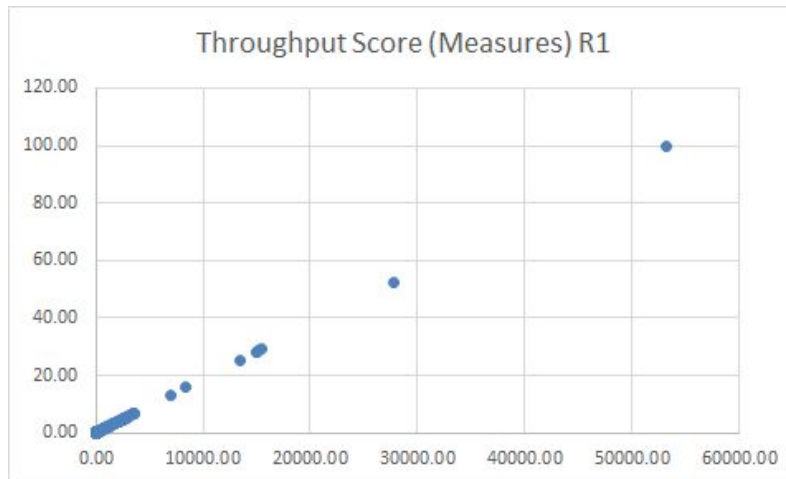


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Round 3 Observations

- Congestion scores were better distributed in Rounds 1 and 2



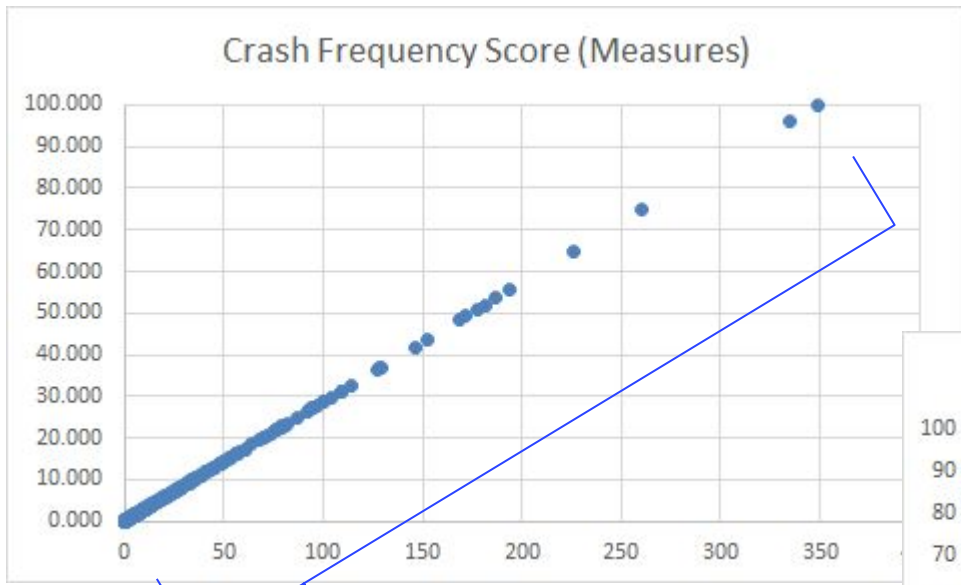


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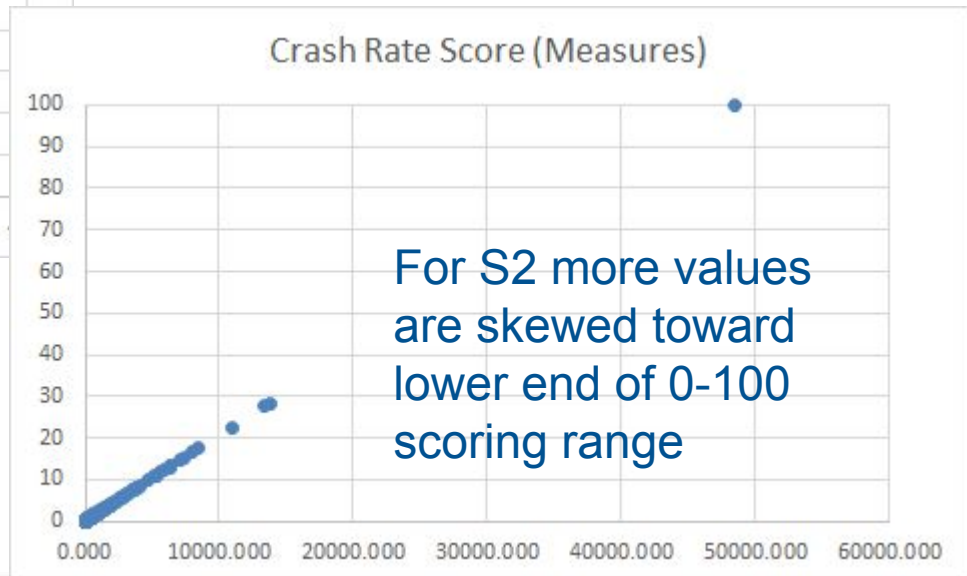
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Round 3 Observations

- Let's look at same charts for safety measures

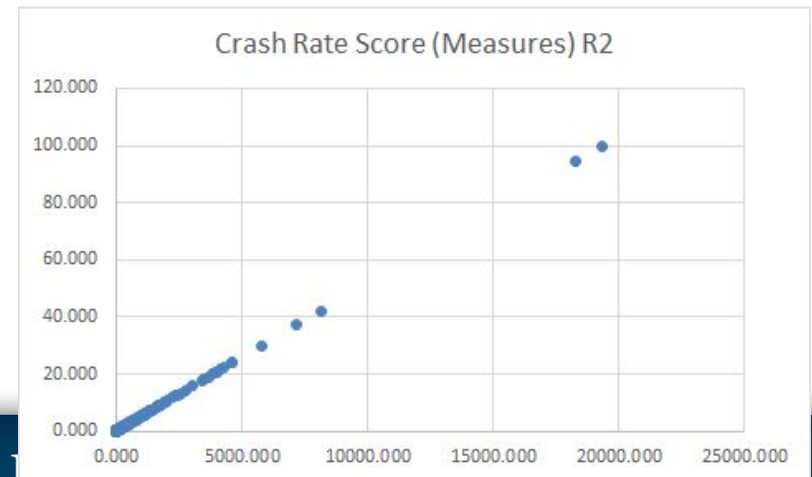
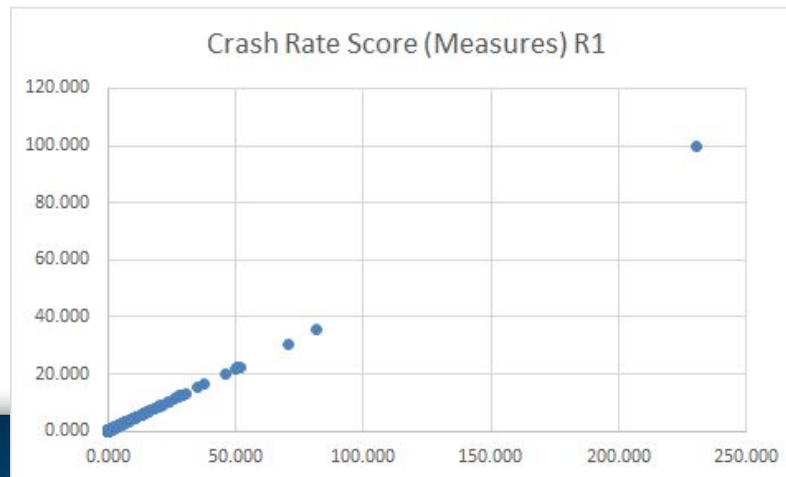
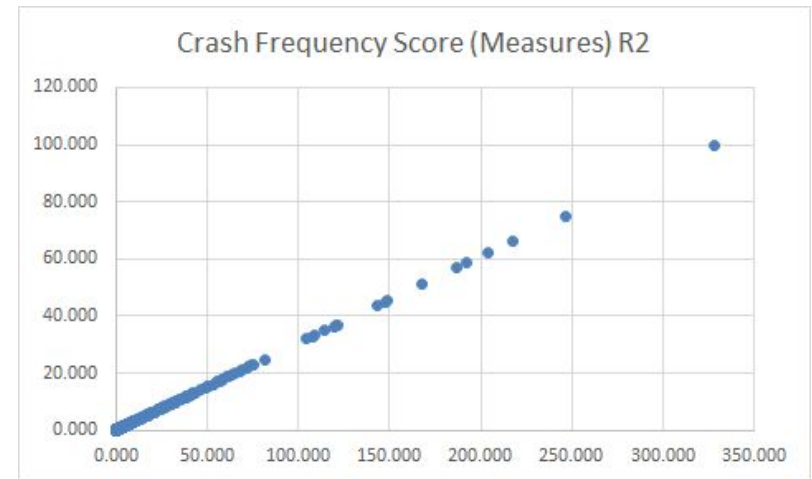
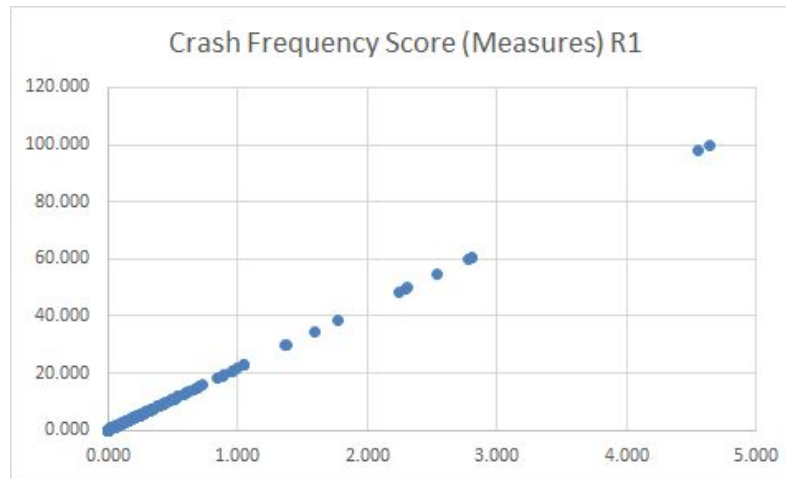


More even distribution of scores throughout the 0-100 scoring range - for this reason the S1 measure was more impactful than the S2



Round 3 Observations

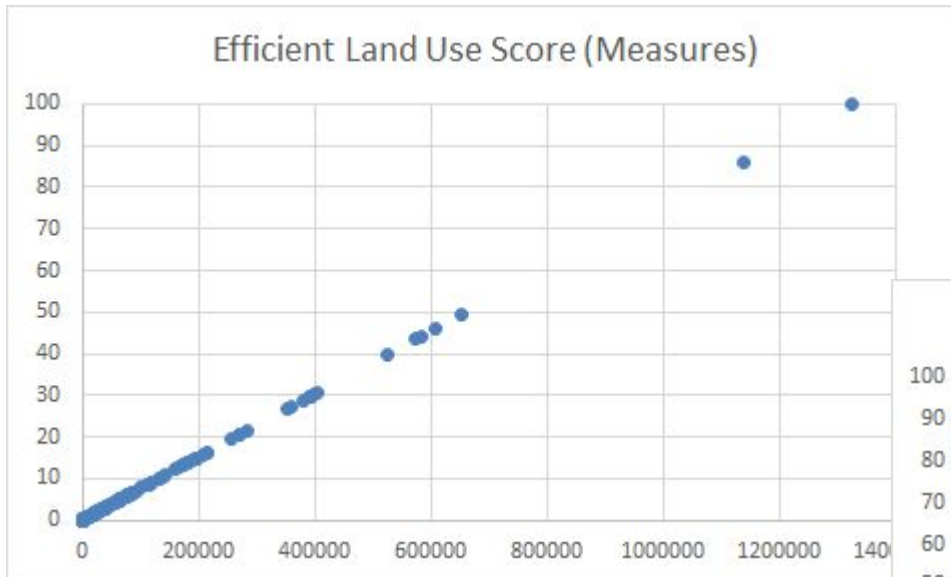
- Safety scores were also well-distributed in Rounds 1 and 2



Round 3 Observations

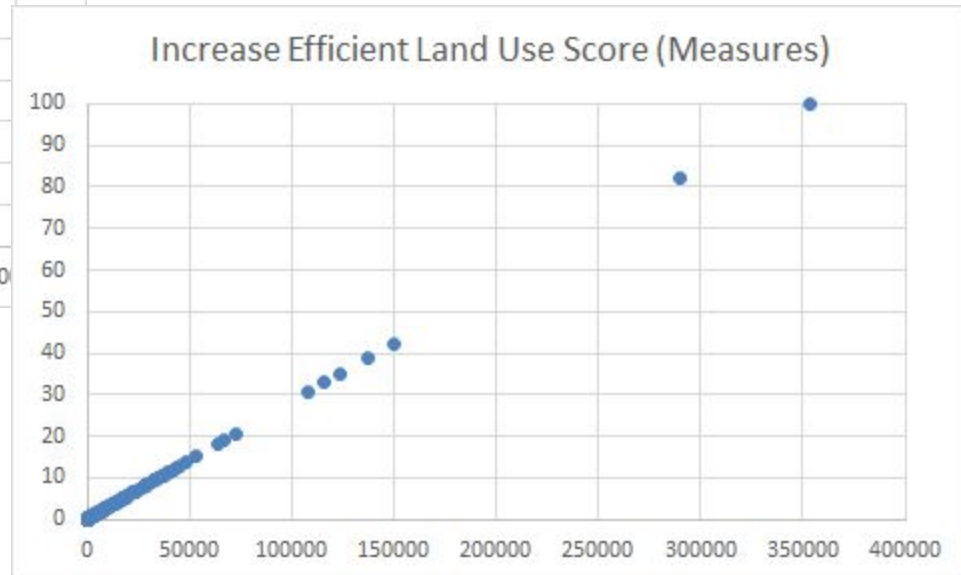
- Let's look at same charts for land-use measures

Efficient Land Use Score (Measures)



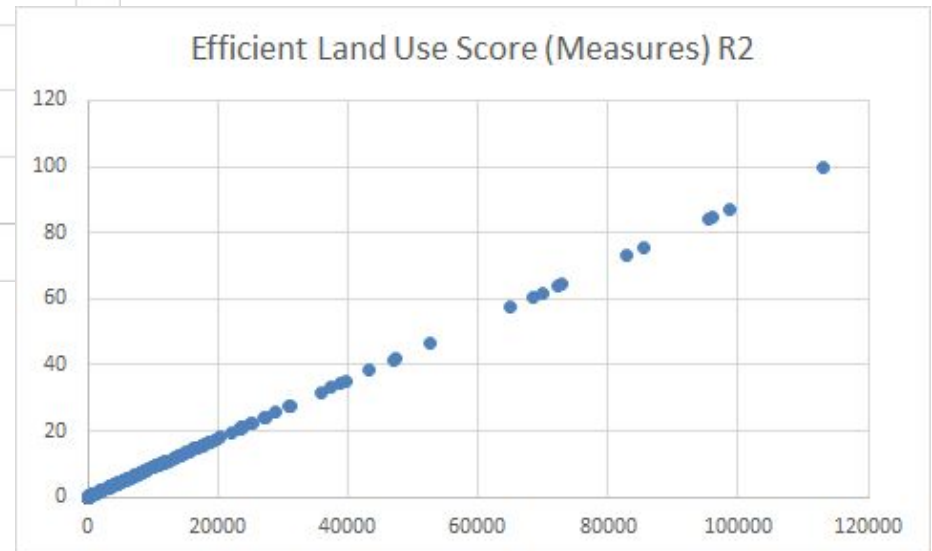
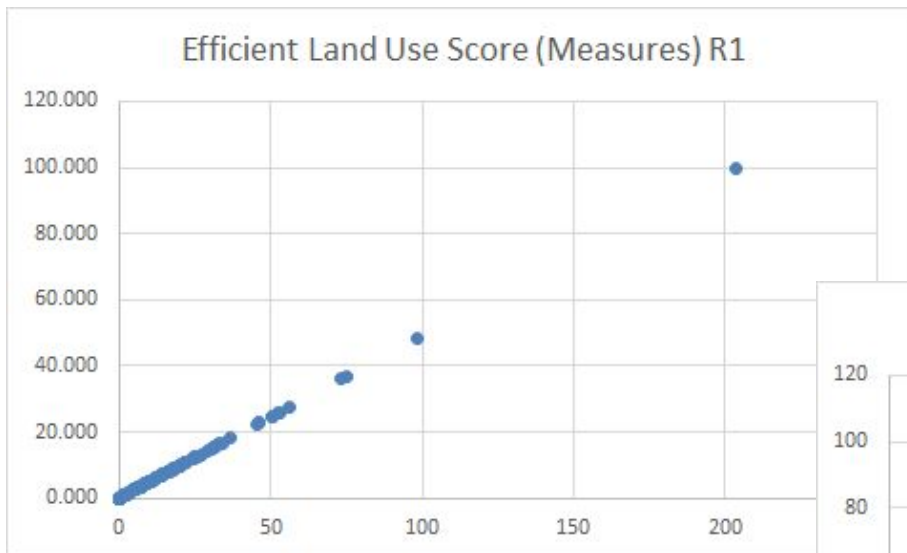
More even distribution of scores throughout the 0-100 scoring range

Increase Efficient Land Use Score (Measures)



Round 3 Observations

- Land Use Scores* were also well-distributed in Rounds 1 and 2



*As discussed above, Land Use was measured differently in Rounds 1 and 2; the overall factor area was well-distributed in all rounds, regardless of scoring approach

Round 3 Observations

- **Rounds 1 and 3 had very similar distributions of points by factor area**
- **Round 2 shifted much more to funding projects earning their points in Congestion and less from Safety**
- **In all three rounds, Land Use has contributed very significantly to project funding; this is likely because Area Types A and B receive a larger apportionment of district funding and most Area Type A and B projects earn at least some points from Land Use**
- **Factor areas with more evenly distributed scores tend to make up a greater proportion of all points earned**

Congestion



- **SMART SCALE team is looking at the following areas related to congestion**
 - Accounting for weekend congestion
 - Weighting of C1 versus C2 - currently 50/50
 - Current day versus 10 years in future
 - Scaling throughput
 - New tools and methods - simulation models

- **SMART SCALE team is looking at the following areas related to safety**
 - Targeted Crash Modification Factors (CMFs)
 - Weighting of S1 versus S2 - currently 50/50

Safety

Crash Modification Factors



- Crash modification factors (CMFs) calculate a projected crash reduction due to a project improvement
 - CMF of 0.80 = 20% reduction in crashes
- CMFs may be:
 - Total: apply to all crash types
 - Used in previous rounds of SMART SCALE
 - Targeted: apply to a specific crash type
 - Nighttime crashes for lighting
 - Roadway departure crashes for shoulder improvements
- Total CMFs can overestimate (more common) or underestimate project benefits based on crash patterns

Safety

Crash Modification Factors



- **Project 3921 - Rte. 340/522 Lighting Project**
 - Funded
 - Safety Score Rank = 12
 - Install street lighting along Route 340/522
- **Round 3 Crash Reduction**
 - 30% reduction applied to 66 crashes (1,465 equivalent property damage only [EPDO] crashes)
 - $0.30 * 1,465 =$ **reduction in 440 EPDO crashes**
- **Targeted Crash Reduction**
 - 53% reduction applied to 5 crashes that occurred in darkness (210 EPDO crashes)
 - $0.53 * 210 =$ **reduction in 111 EPDO crashes**

Economic Development Sites



- Policies adopted by the Board for Round 3 improved the reasonableness of economic development results
- Zoned only properties has to be adjacent to the proposed transportation improvement
- In validating zoned properties and conceptual site plans we noticed several examples of high floor area ratios (FAR) - values in range of 5 were not uncommon
- Applicants uploaded zoning ordinances showing that larger FAR are allowed, but that does not mean they are likely

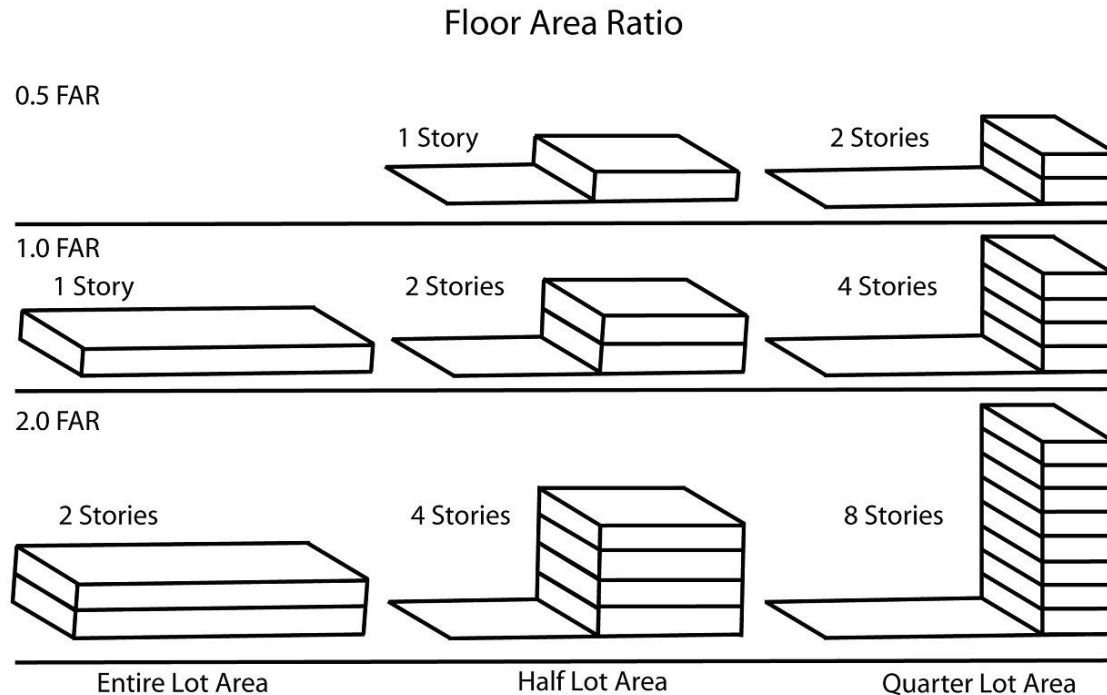
Weighting Sites based on Readiness

Highest
↑
↓
Lowest

Approved Detailed Site Plan
Submitted Detailed Site Plan
Approved Conceptual Site Plan
Submitted Conceptual Site Plan
Zoned Only

Floor Area Ratio Explained

Floor area ratio is the ratio of a building's total floor area to the size of the piece of land upon which it is built



Economic Development Sites



- Floor Area Ratio (FAR) assumptions for zoned-only properties can be problematic
- Large industrial tracks (250+ acres) with assumed FARs of 1.0 - 250 ac = 10,890,000 sqft
 - **Boeing Everett Factory - 4.28M sqft**
- Several tracts with assumed FARs of 5.0 or higher
- Applicants provided documentation of local ordinances allowing FAR value used - just because it is allowed does not mean it is likely
- **Consideration for next round - default FAR assumption for zoned only properties (.30)**

Land Use

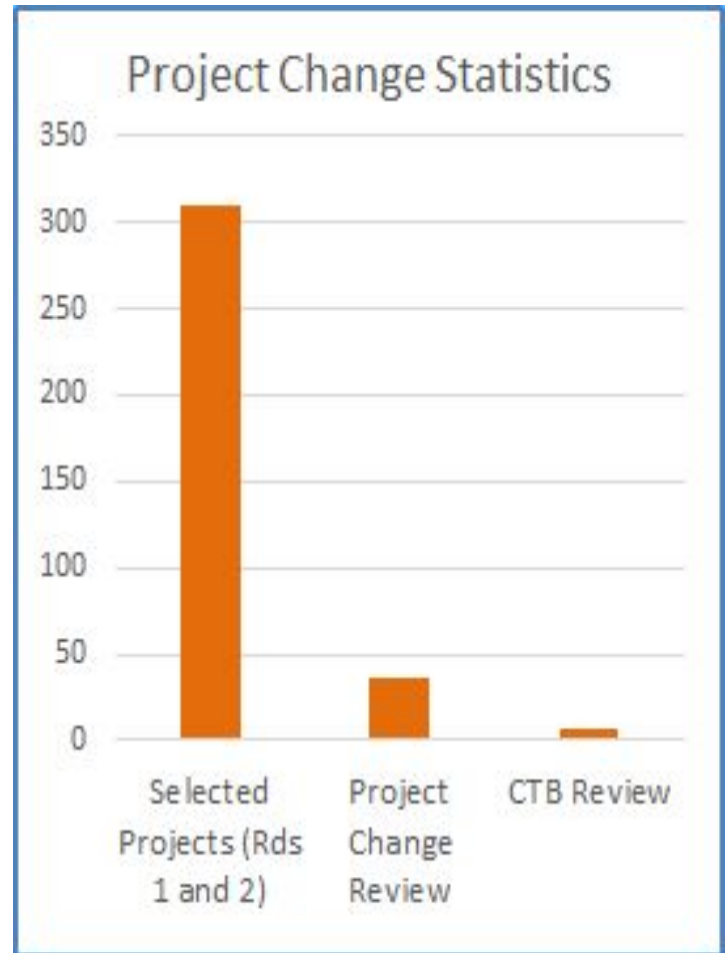


- For Round 3, the Board adopted a new method objective metric to replace subjective metric to measure a project's support for transportation efficiency of development
- L1 multiplies non-work accessibility by future density; this favors projects in areas that are already very dense over projects in areas that, though growth may be expected, existing density is low
- L2 multiplies non-work accessibility by the *change* in population and employment; this measure favors projects in areas where growth is expected regardless of initial density

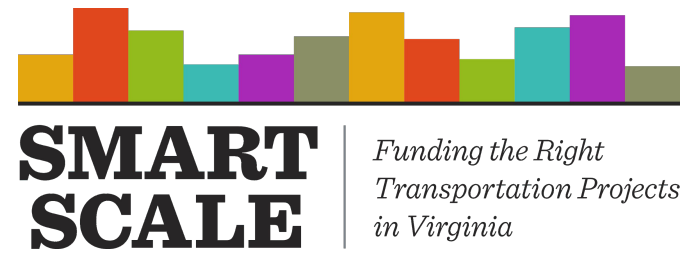
Project Changes and Rescoring



- Over 300 projects selected in Rds 1 & 2
- 36 projects (12%) have experienced documented project change
 - Scope change or budget increase
- 7 projects (3%) have required CTB action
 - 4 budget increases
 - 2 scope modifications
 - 1 both
- Project Change Guidance was established previously and is in the process of being updated



Blind Scoring



- **Randomly selected 10+% of SMART SCALE projects to reevaluate congestion and safety scoring measures**
 - New for Round 3: Blind scoring was conducted by a separate external team - independent from official scoring team
- **Congestion and safety measures were selected due to the significant number of inputs and complexity of analysis**
 - 62 total projects were randomly selected for reevaluation
 - Project analysis types and locations were distributed across each VDOT district
- **Re-evaluate and compare projects independent of initial scoring**
 - Accomplished with new analyst and new internal QC

Blind Scoring



Improvements to safety and congestion QC process identified during Round 2 were made to Round 3

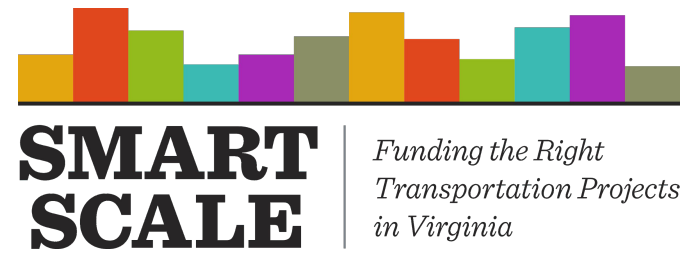
- Held weekly team meetings to improve communication/consistency
- Incorporated traffic volume development tool into scoring tool
- Incorporated standard assumptions documentation into scoring tool

Congestion Blind Scoring Round 3 Findings



- Nearly half of projects had identical throughput and/or delay measure scores
- Larger differences in 10% QC results were attributed to the blind scoring team not having access to the same applicant data and lack of hands-on scoring experience
- Blind scoring results were run through the funding steps and it was determined the differences would not have affected the staff recommended funding scenario

Congestion Blind Scoring Recommendations for Round 4



- **Improve congestion scoring training to include extensive hands-on scoring a variety of project types**
- **Develop methods for sharing data provided by applicants while maintaining a partition between official and blind scoring**
- **Develop easy-to-digest congestion scoring user guide**
- **Provide step-by-step guidance on volume development**
- **Improve workflow between congestion and bike/ped scoring**
- **Create clear guidelines on determining a project's Peak Hour Expansion Factor**

Safety Blind Scoring

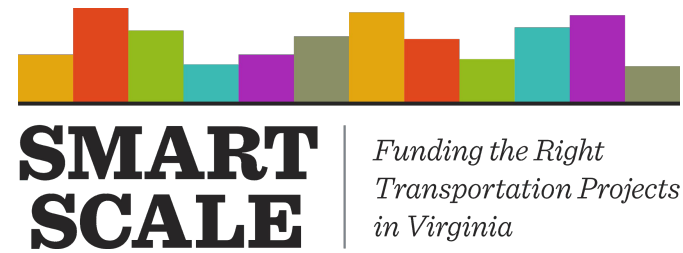
Round 3 Findings



Official score was more consistent with adopted scoring methods than blind scoring three-quarters of the time

- **Issue with inconsistent segment length between analysts (sensitive on smaller projects)**
- **Inconsistent application of CMF values- especially on non-standard designs**
- **Inconsistent application of new intersection and new alignment roads**

Safety Recommendations for Round 4



- **Provide more training focusing on**
 - Understanding plans
 - Travel Demand Model inputs
 - Segmentation
 - Influence areas
 - CMF selection
- **Refine CMF list to minimize changes during scoring**
- **Refine scoring process for: new alignment, segmentation, one directional improvements**



COMMONWEALTH of VIRGINIA

Commonwealth Transportation Board

Shannon Valentine
Chairperson

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COMMONWEALTH TRANSPORTATION BOARD WORKSHOP AGENDA

The Virginian Hotel
Eleanor Rose Madison Room
712 Church Street
Lynchburg, Virginia 24504.
July 16, 2019
10:00 a.m.

8. Director's Items

*Jennifer Mitchell, Virginia Department of Rail and Public Transportation
This item does not have a presentation associated with it.*



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9. Commissioner's Items
Stephen Brich, Virginia Department of Transportation
This item does not have a presentation associated with it.



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10. Secretary's Items

Shannon Valentine, Secretary of Transportation

This item does not have a presentation associated with it.