



COMMONWEALTH of VIRGINIA

Commonwealth Transportation Board

Shannon Valentine
Chairperson

1401 East Broad Street
Richmond, Virginia 23219

(804) 786-2701
Fax: (804) 786-2940

COMMONWEALTH TRANSPORTATION BOARD WORKSHOP AGENDA

VDOT Central Office Auditorium
1221 East Broad Street
Richmond, Virginia 23219
October 16, 2019
10:00 a.m.

1. Addition of Certain Streets in Richmond to the
Primary State Highway System
JoAnne Maxwell, Virginia Department of Transportation
2. I-81 Corridor Improvement Plan
Project Scheduling
Bart Thrasher, Virginia Department of Transportation
Dave Covington, Virginia Department of Transportation
3. SmartScale
Chad Tucker, Office of Intermodal Planning and Investment
4. VDOT Organizational Changes
Workforce of Tomorrow
Rob Cary, Virginia Department of Transportation
5. Comprehensive Review Routine Maintenance
Stephen Brich, Virginia Department of Transportation
6. Hampton Roads Express Lanes
Stephen Brich, Virginia Department of Transportation
7. Interstate 95 Study
Nick Donohue, Deputy Secretary of Transportation
8. Sustainability Update
Nick Donohue, Deputy Secretary of Transportation
9. Director's Items
Jennifer Mitchell, Virginia Department of Rail & Public Transportation

Agenda
Meeting of the Commonwealth Transportation Board
Workshop Session
October 16, 2019
Page 2

10. Commissioner's Items
Stephen Brich, Virginia Department of Transportation

11. Secretary's Items
Shannon Valentine, Secretary of Transportation
#



Addition of Certain Streets in Richmond to Primary State Highway System

Jo Anne Maxwell
Director, Governance and Legislative Affairs
October 16, 2019

Background

- **The Department of General Services (DGS) is currently engaged in a series of major construction and renovation projects in Capitol Square.**
- **One of the projects involves reconstruction and renovation of the General Assembly Building at 9th and Broad streets.**
- **During the renovation, the General Assembly has relocated to the Pocahontas Building which is situated at the corner of 9th and Main streets.**

Background (cont'd)

- **Bank Street is situated between the Pocahontas Building and Capitol Square and is heavily traversed by pedestrians, when the General Assembly is in session and at other times during the year.**
- **As part of the plan for Capitol Square, DGS plans to repurpose a significant portion of Bank Street and connecting streets to facilitate pedestrian traffic and access to Capitol Square.**

CTB Action Required

- **During the 2019 Session, the Virginia General Assembly enacted § 4-5.12 of the Appropriations Act to facilitate pedestrian/traffic safety in the “Seat of Government.”**
- **§ 4-5.12 requires the CTB to add the following portions of street rights of way in Richmond to the primary state highway system:**
 - **Bank Street from 9th Street to 14th Street,**
 - **10th Street from Main Street to Bank Street,**
 - **12th Street from Main Street to Bank Street,**
 - **Governor Street from Main Street to Bank Street**

Maintenance and Other Responsibilities After CTB Action

- **DGS and Division of Capitol Police are charged with controlling these rights-of-way and pedestrian and vehicular traffic thereon pursuant to their typical responsibilities.**
- **Pursuant to § 33.2-310 of the Code of Virginia, VDOT will maintain/operate the rights of way and may do so by contracting with private entities or the city of Richmond.**

Next Steps

- **CTB is required to add the specified rights of way to the Primary State Highway System by January 1, 2020.**
- **In December, VDOT will present to the CTB an action item requesting that the CTB add the specified portions of Bank, 10th, 12th, and Governor streets to the Primary State Highway System as set forth in the 2019 Appropriations Act.**

I-81 CORRIDOR IMPROVEMENT PLAN PROJECT SCHEDULING

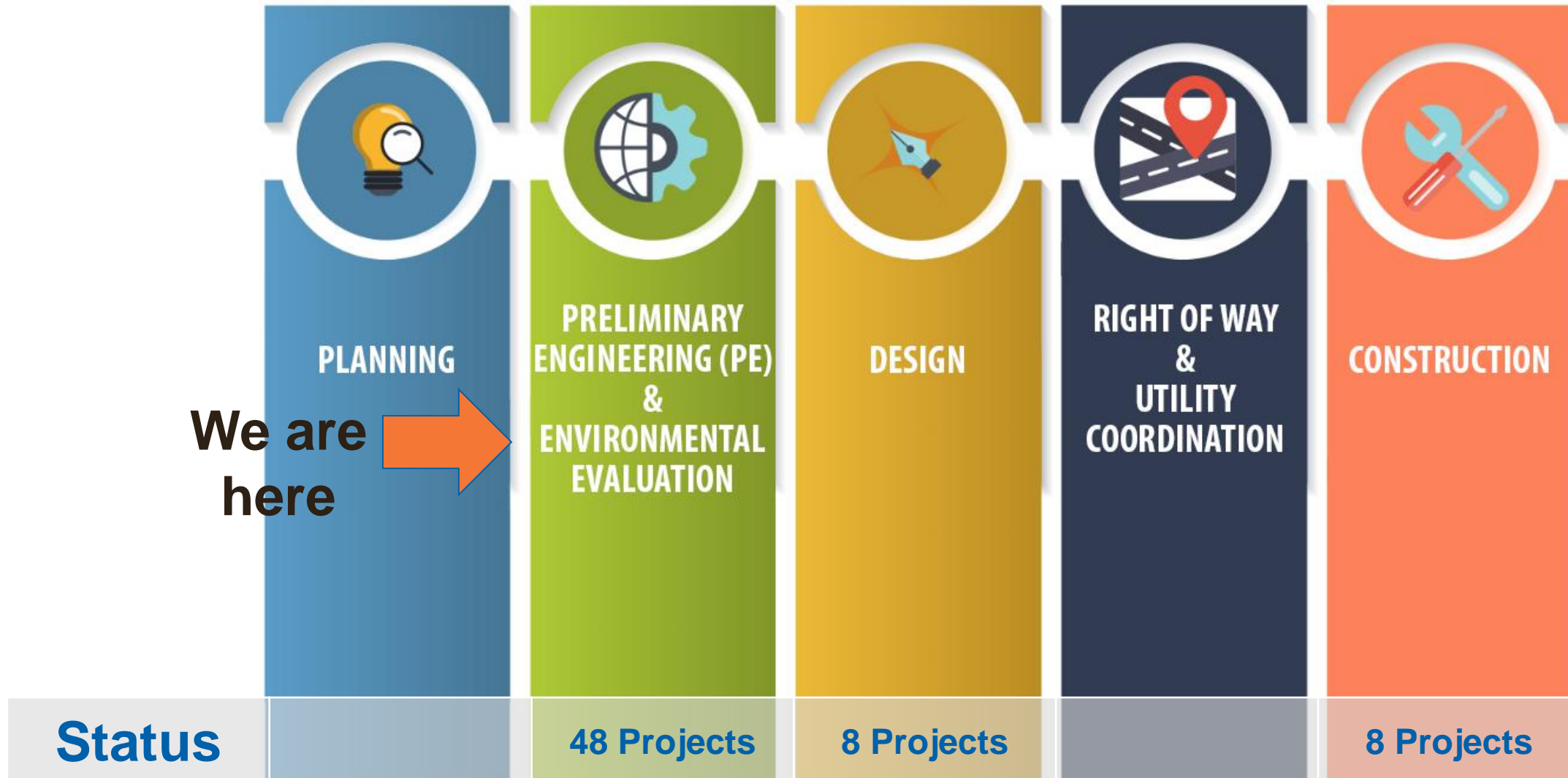
I-81 Commonwealth Transportation Board Briefing

Bart Thrasher, PE
VDOT Chief Engineer

David Covington, PE
I-81 Program Delivery Director

October 16, 2019

Project Development Process



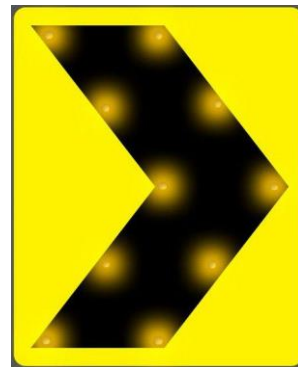
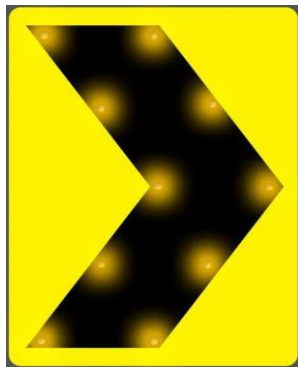
\$2 billion in I-81 Plan Capital Improvements

District	Number of Projects by Type							Total Number of Projects	Total Cost (millions \$) 2018 \$
	Widening	Auxiliary Lane	Truck Climbing Lane	Acceleration Lane Extension	Deceleration Lane Extension	Curve Improvement	Shoulder Widening		
Bristol District	1	3	3	6	10	4	0	27	\$285.3
Salem District	5	0	0	4	2	3	0	14	\$875.4
Staunton District	4	1	2	10	4	1	1	23	\$838.1
Total I-81 Corridor Number of Improvements	10	4	5	20	16	8	1	64	\$1,998.8

Mainline Safety Capital Improvements Underway

Curve Improvements (Static and/or Flashing Chevrons)

District	Number of Locations	Planned Installation Date
Bristol District	4	Fall 2019
Salem District	3	Fall 2019
Staunton District	1	Fall 2019
Total	8	



Mainline Capital Improvements Under Design

Acceleration/Deceleration Lane Extensions

District	Number of Locations	Project Status
Bristol District	2	Underway
Salem District	1	Underway
Staunton District	5	Underway
Total	8	

- All of these projects are included in the FY20-25 Six-Year Improvement Program
- Of the 16 initial programmed projects, 8 will be complete, and 5 will be under construction in 2020

48 Remaining Capital Improvement Highlights

Bristol District

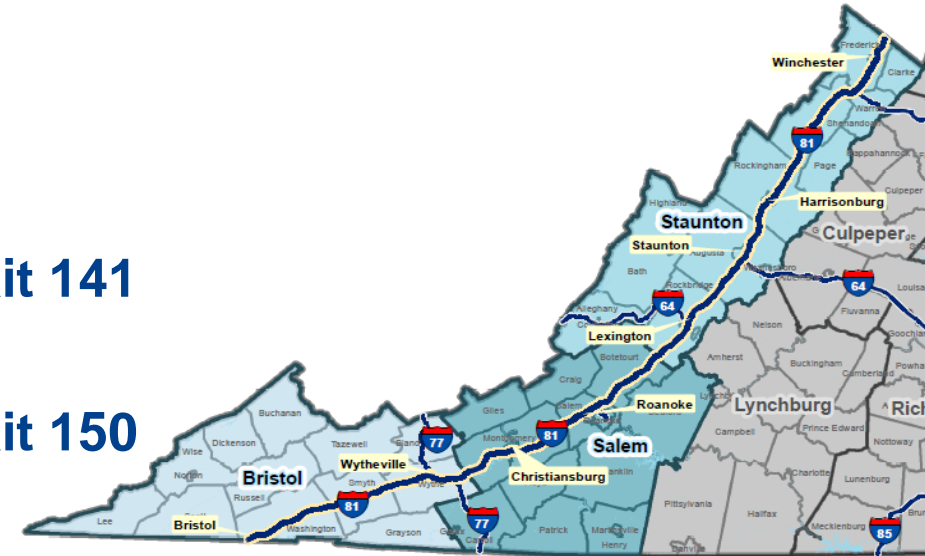
- Add northbound truck climbing lane from Exit 32 and from Exit 39
- Add a southbound truck climbing lane (Chilhowie)
- Various improvements at both I-77/I-81 interchanges

Salem District

- Widen northbound from Exit 119 to Exit 137
- Widen northbound and southbound from Exit 137 to Exit 141
 - Connects to active widening from Exit 141 to Exit 143
- Widen northbound and southbound from Exit 143 to Exit 150

Staunton District

- Widen northbound and southbound from Exit 222 to Exit 225 (Staunton)
- Add northbound and southbound truck climbing lanes (Weyers Cave)
- Widen northbound and southbound from Exit 243 to 248 (Harrisonburg)
- Widen northbound and southbound from Exit 313 to Exit 317 (Winchester)



Develop Planning Level Costs and Schedule

- **Planning level cost estimates have been reviewed and refined**
 - **VDOT internal review**
 - **Independent consultant**
- **Costs are still at an order of magnitude level and will change as VDOT progresses through scoping and design-**
 - ***“we don’t know what we don’t know”***
- **Draft project schedules, anticipated environmental clearances and spend plans developed**

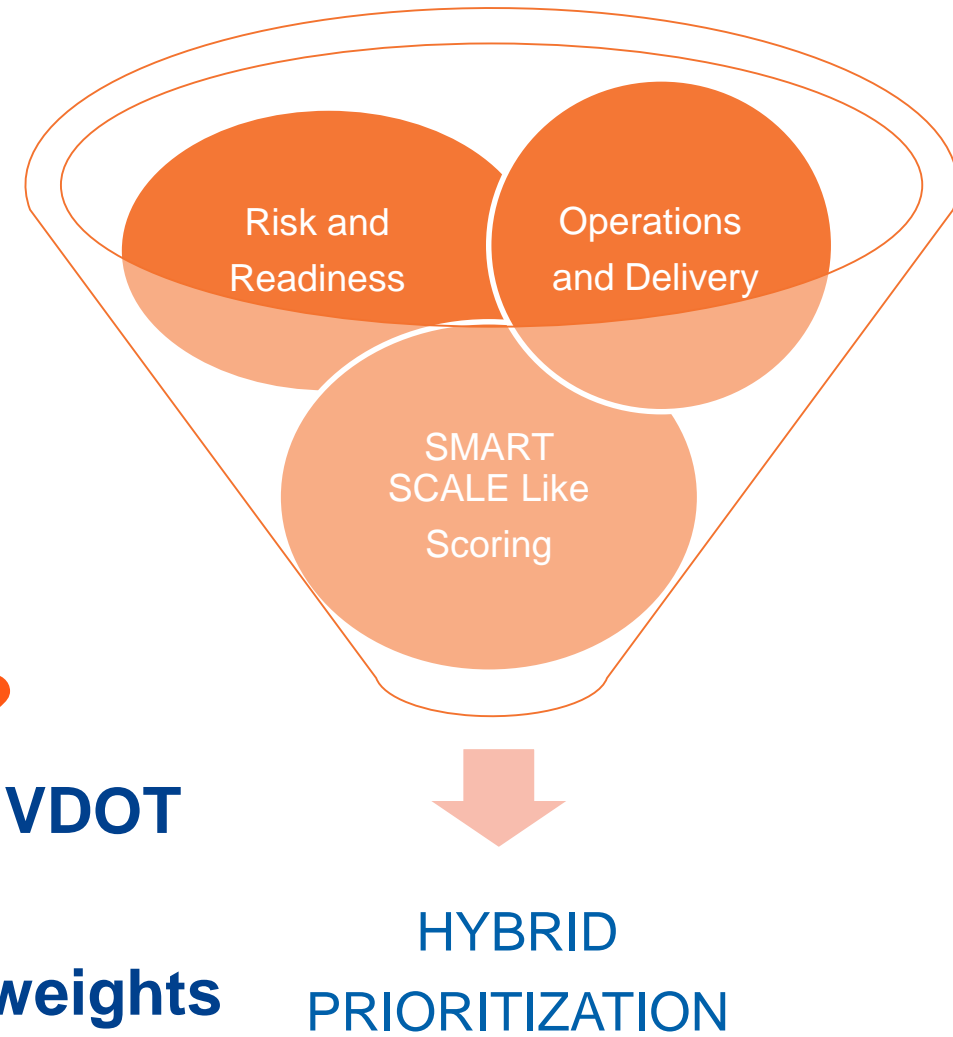
Hybrid Prioritization

Hybrid Prioritization =

- “SMART SCALE-like” scoring (25%)
+
- Project Risk and Readiness (15%)
+
- Operations and Delivery (60%)

Are Project Risk and Readiness and Operations and Delivery quantitative?

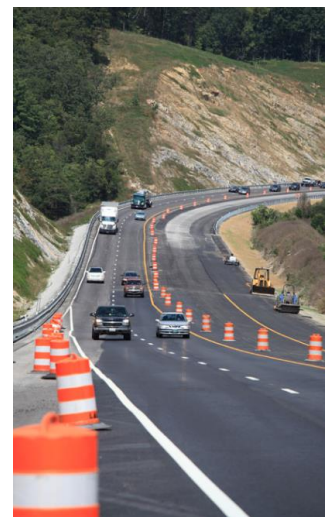
- Scores are based on cumulative knowledge of VDOT staff
- Process enabled VDOT to assign quantitative weights to value judgements



Risk and Readiness

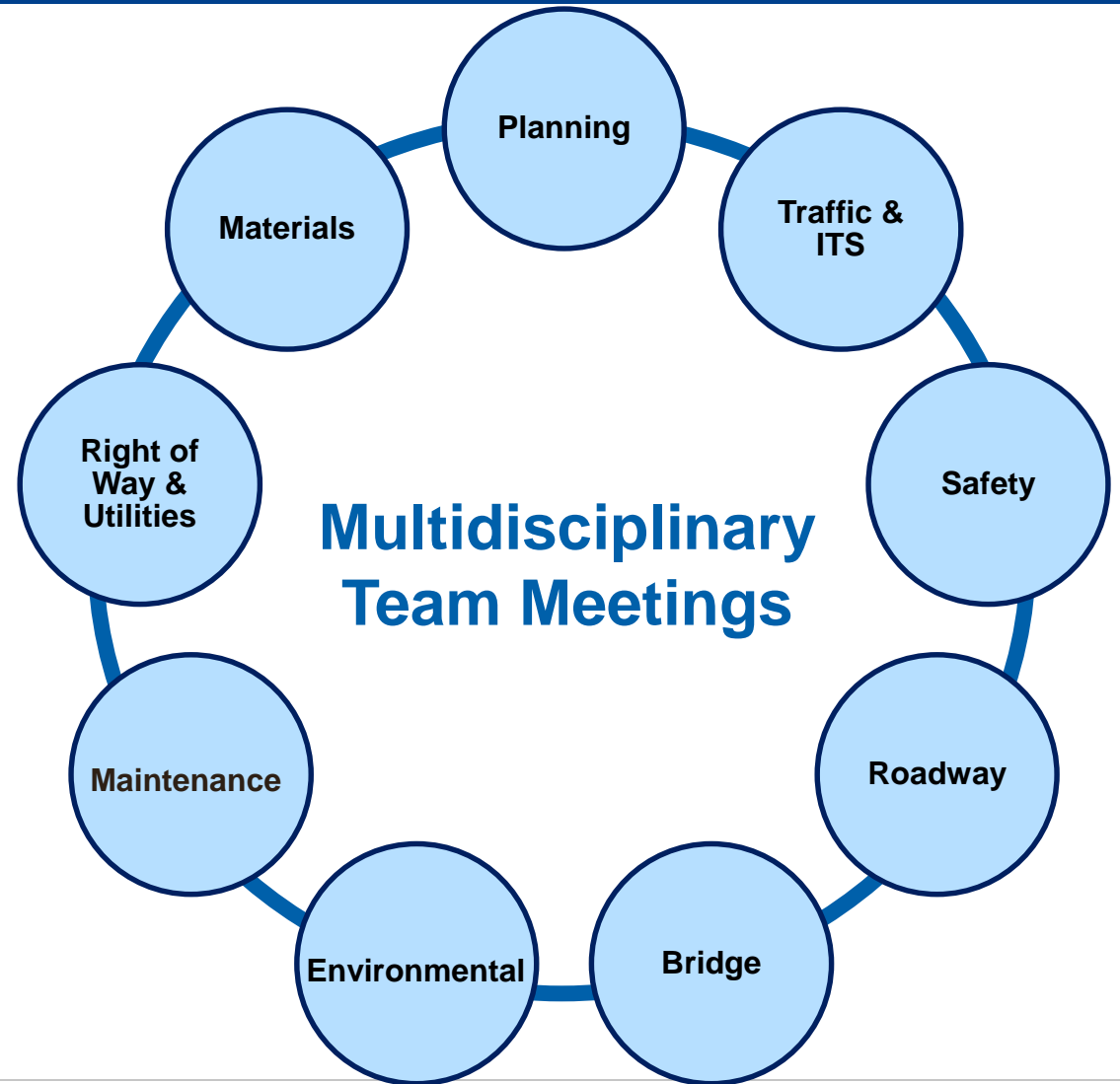
Schedule, budget, and environmental:

- Constructability
- Right-of-way
- Utilities
- Soil/rock conditions
- Interchange impacts
- Structures (bridges, walls, etc.)
- Environmental permitting



Operations and Delivery

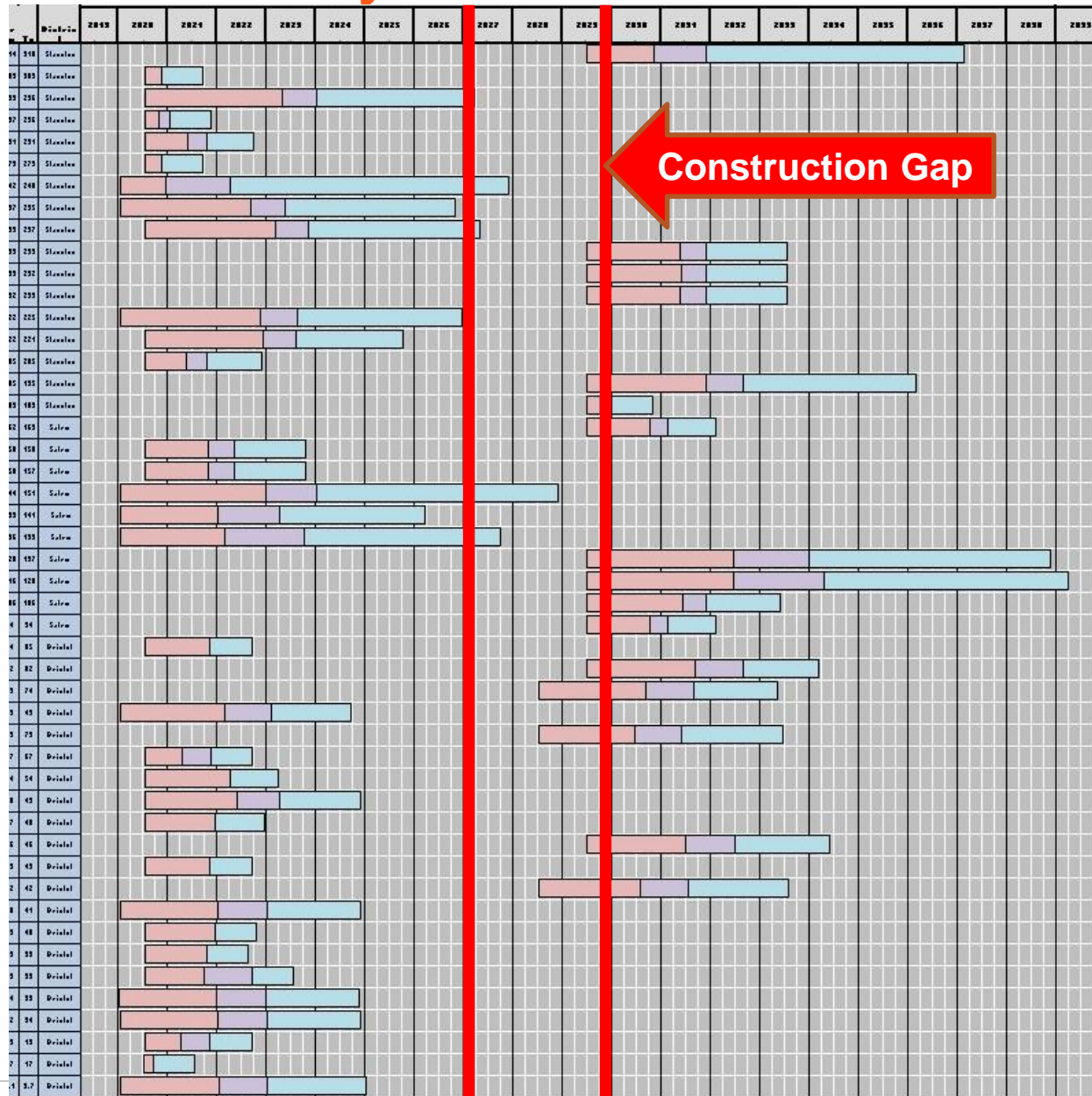
- Value judgement by VDOT staff, focusing on efficient and economical delivery of program
- Considered:
 - Phasing
 - Maintenance of Traffic
 - Bundling projects
 - Project delivery based on scope



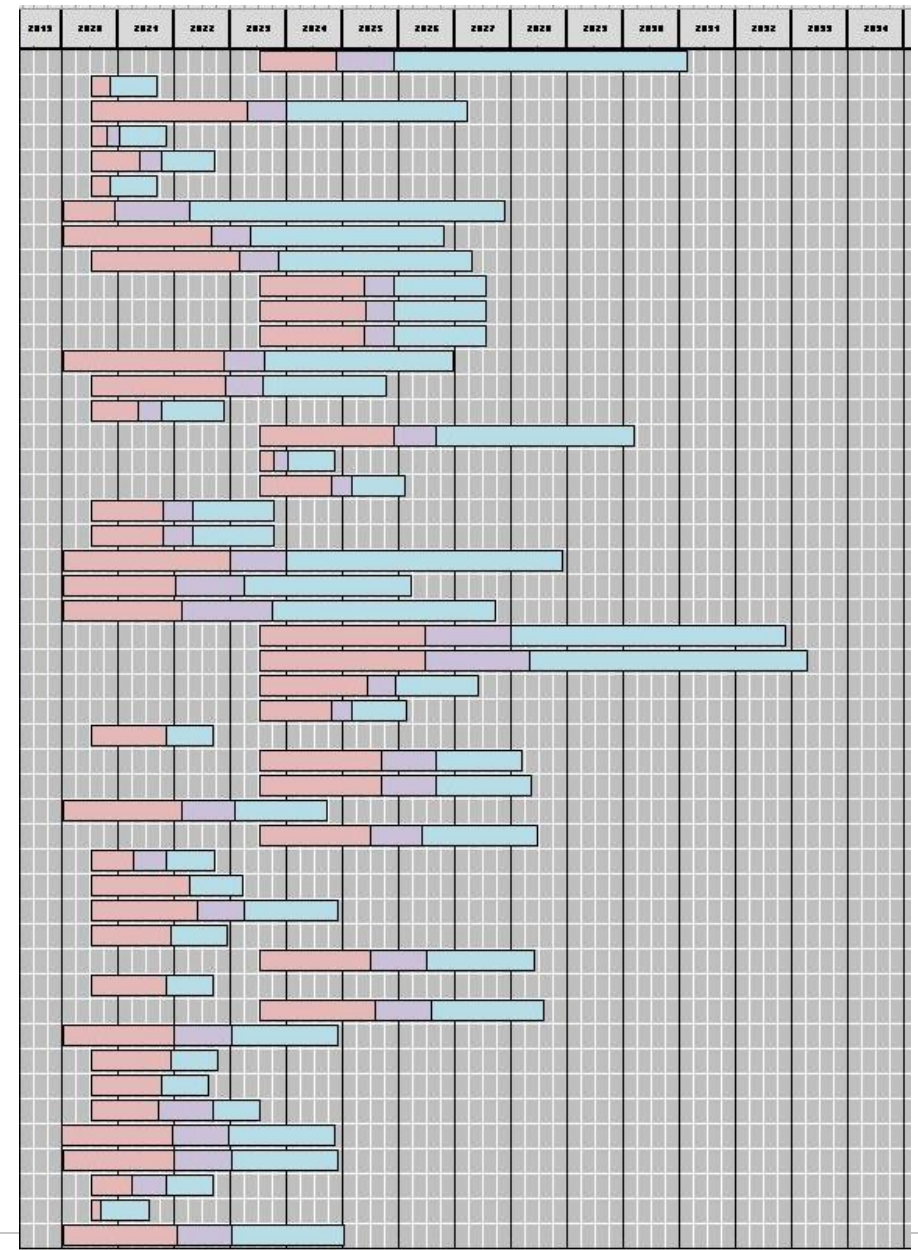
Draft Schedule for Priority Recommendations

- **Reflects a hybrid prioritization**
- **Two scheduling options presented**
 - Existing revenue stream (pay-go)
 - Bonding/TIFIA
- **Existing revenue stream (pay-go)**
 - 48 out of 64 projects completed by 2028
- **Bonding/TIFIA option**
 - Creates sustainable pipeline of projects
 - Minimizes disruption for drivers and industry along corridor
 - 60 out of 64 projects completed by 2028

Pay-Go Schedule



Bonding/TIFIA Schedule



Reading the Draft Schedule

Mile Marker		District	Jurisdiction	Study Project ID	Direction	Improvement Description	Hybrid Prioritization Rank	SMART SCALE Benefit/Mile Rank (25%)	Risk and Readiness Rank (15%)	Operations and Delivery (60%)	SMART SCALE Benefit Rank	Proposed Environmental Document Type	Proposed Delivery Method	Order of Magnitude Estimate Range
From	To													

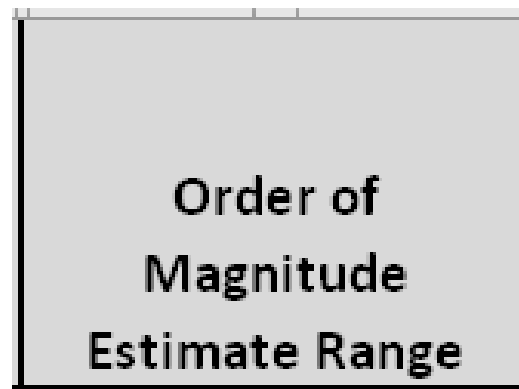
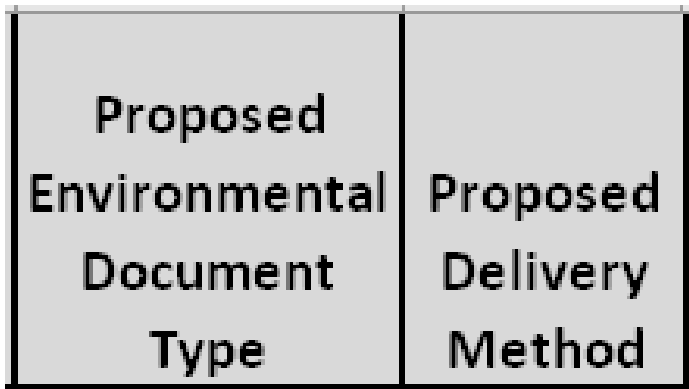
Hybrid Prioritization Rank: incorporates SMART SCALE benefit/mile (25% weight); Risk, Readiness, Operations and Delivery (75% weight)- includes sequencing and coordination with SYIP projects



Hybrid Prioritization Key Factors

Reading the Draft Schedule

Mile Marker		District	Jurisdiction	Study Project ID	Direction	Improvement Description	Hybrid Priorization Rank	SMART SCALE Benefit/Mile Rank (25%)	Risk and Readiness Rank (15%)	Operations and Delivery (60%)	SMART SCALE Benefit Rank	Proposed Environmental Document Type	Proposed Delivery Method	Order of Magnitude Estimate Range
From	To													



Refined order of magnitude level cost estimate range based on additional review

Anticipated level of environmental document required

Proposed delivery method- Design-Bid-Build (D/B/B) or Design-Build (D/B)

- Preliminary Engineering
- Right of Way Acquisition
- Construction

Project Delivery Options

- **VDOT is collaborating with industry on the I-81 project listing and draft schedule**
- **Industry feedback on delivery timeframes is being incorporated**
- **Options for project delivery**
 - **Design-Bid-Build: projects are largely defined**
 - **Design-Build: opportunities identified for innovation and risk transfer**

Takeaway Scorecard

Activity	Status	Anticipated Completion
Safety Service Patrol expansion	Complete	July 2019
Curve improvements (8)	Underway	Fall 2019
Initial accel/decel lane extensions (8)	Underway	Spring 2021
Additional cameras (51)	Underway	Spring 2020
Additional changeable message signs (31)	Underway	Spring 2020
Remaining capital projects (48)	TBD	Under Pay-Go scenario, 75% complete by 2028 Under bonding scenario, 94% complete by 2028

I-81 Committee Meeting- October 1, 2019

- **At the October meeting, the I-81 Committee:**
 - **Endorsed the methodology used to draft I-81 program schedule**
 - **Endorsed pursuing bonding and TIFIA to advance the I-81 program**
 - **Recommended to the CTB the initial 31 projects to be added to the Six Year Improvement Program**

Next Steps

- **Receive feedback**
- **Recognize schedules will change based on:**
 - **Financing options (to be determined)**
 - **Collaboration with industry**
- **Action to amend SYIP with an additional 31 capital improvement projects scheduled to start preliminary engineering by the end of the calendar year**
- **I-81 website: www.VA81corridor.org**



COMMONWEALTH of VIRGINIA
Office of the
SECRETARY of TRANSPORTATION

Proposed Enhancements to SMART SCALE Policies and Methods - Round 4

October 16 , 2019





Summary



- Timeline and schedule
- Project eligibility
- Project Readiness
- Analytical methods and weights



SMART SCALE

*Funding the Right
Transportation Projects
in Virginia*

SMART SCALE is coming...



ROUND 4
IS COMING

Round 4 Submission Deadline

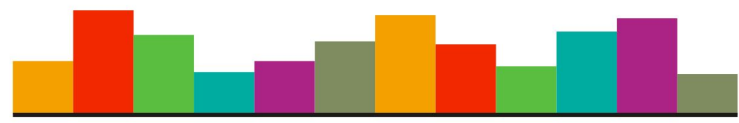
1 week before deadline



Round 4 Submission Deadline

1 hour before deadline

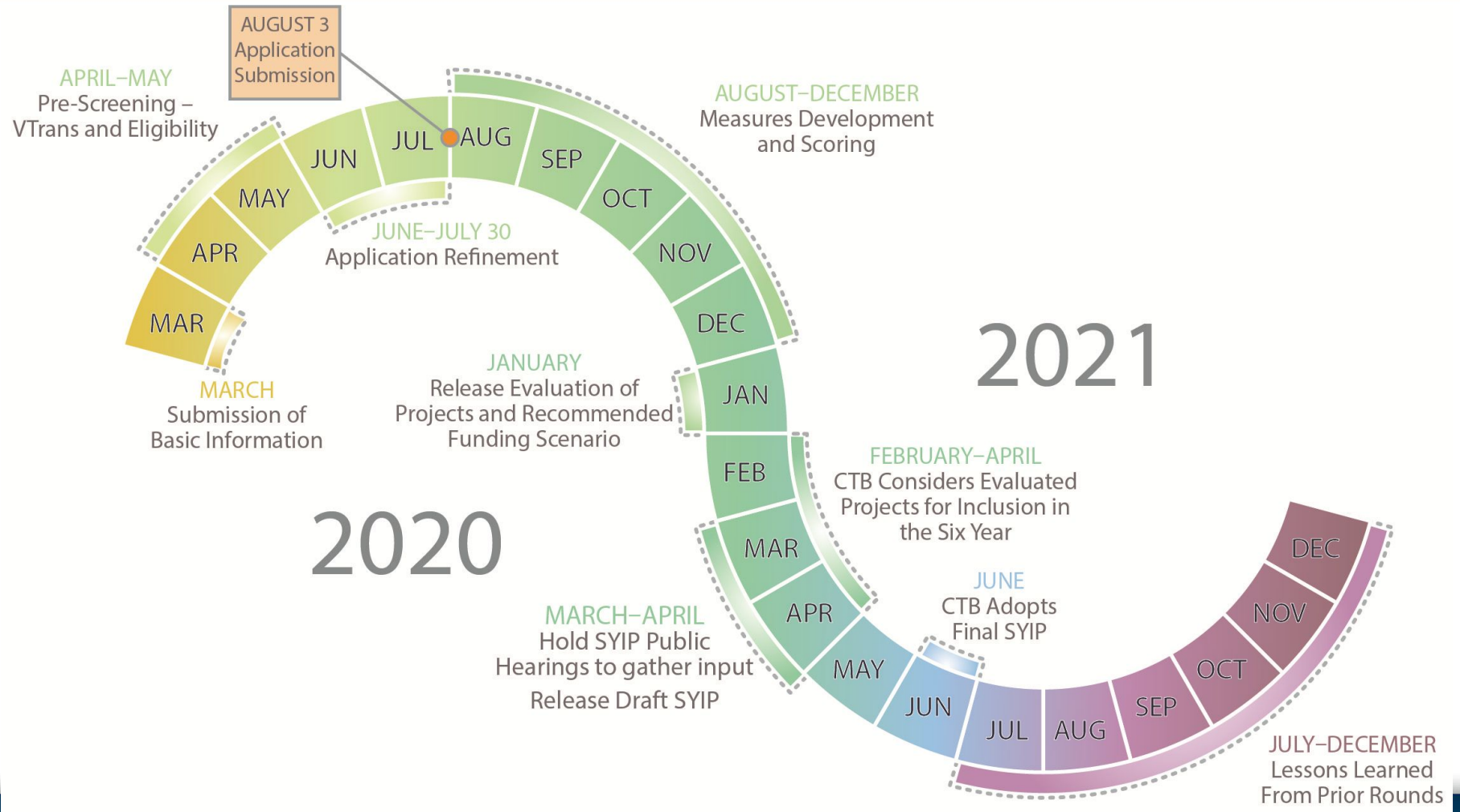




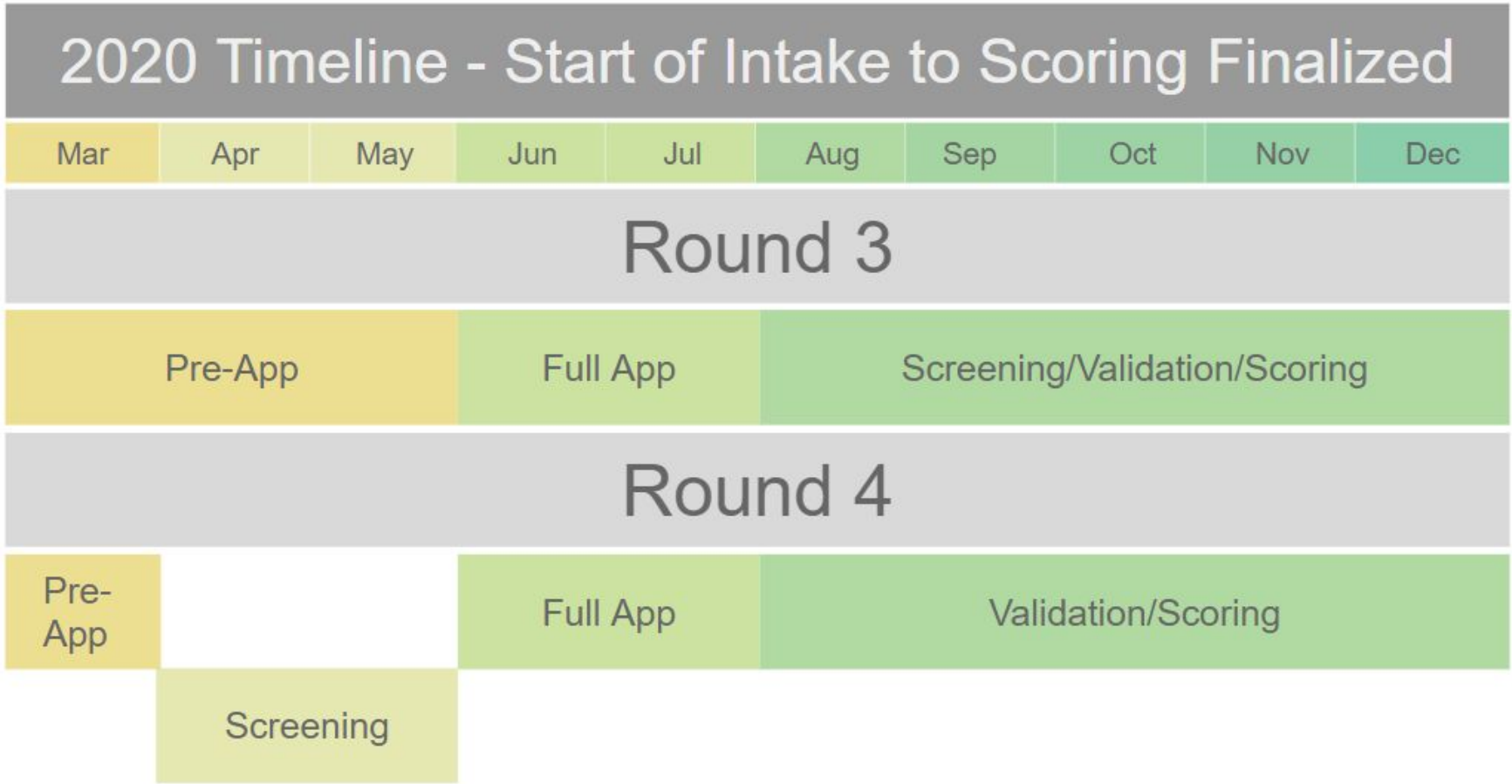
SMART SCALE

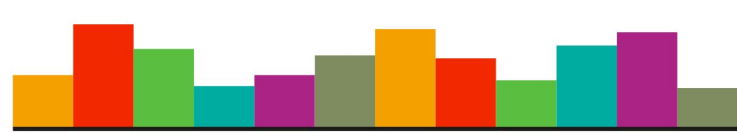
*Funding the Right
Transportation Projects
in Virginia*

Round 4 Timeline



Differences in timeline from Round 3

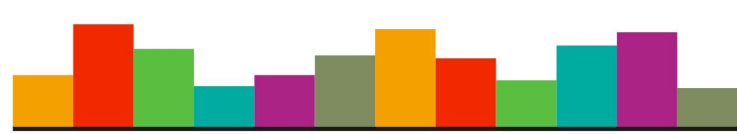




Changes to Timeline

- **Pre-App**
 - Intake window reduced from **3 months to 1 month**
 - **NEW** - Pre-apps that can be submitted will be based on cap limits
 - Cap limit of 10: will be allowed to submit 12 pre-apps (10+2)
 - Cap limit of 4: will be allowed to submit 5 pre-apps (4+1)
 - Pre-application cap limits prevent VDOT/DRPT staff from reviewing applications that will not be submitted while providing cushion in case a project screens out

Localities	MPOs/PDCs/Transit Agencies	Pre-Application Cap	Final Application Cap
Less than 200K	Less than 500K	5	4
Greater than 200K	Greater than 500K	12	10



SMART SCALE

*Funding the Right
Transportation Projects
in Virginia*

Changes to Timeline

- **Screening Applications**
 - 2-month window - VTrans need, eligibility and project readiness
 - Address challenge in Round 3 of major project changes occurring during pre-screening
- **Final Full Application**
 - 2-month window
 - Applicant provides economic development sites and refines final cost estimate and supporting documents
 - Applicant must receive approval from Commonwealth to change scope of work - this is to ensure project still meets VTrans need, readiness and eligibility
 - Can only submit up to their cap limit: 10 or 4 depending on population

Project Eligibility



- Two areas to clarify/limit eligibility:
 - Transit Maintenance Facilities - propose that stand-alone maintenance facilities not be eligible - must include capacity expansion of transit system
 - Systemwide Investments - improvements that do not have a typical from/to and often cover a larger geographic area
 - **Examples**
 - Jurisdiction-wide implementation of adaptive signal controllers
 - Countywide bus stop upgrades
 - Prohibit project applications that include improvements that are jurisdiction-wide
 - Expansive scope and multi-faceted nature of improvements present considerable challenges for scoring and validation

Project Readiness



- Board has strengthened project readiness requirements each round
- Strengthened policies to-date have focused on highway expansion investments - requiring alternative analysis and planning studies
- Recommend similar policy provisions for corridor level adaptive signal controller upgrades and major transit capital investments such as Bus Rapid Transit (BRT) and light rail
 - Corridor level adaptive signal controllers - require detailed corridor study/plan
 - BRT/Light Rail
 - Planning study that shows alternatives considered
 - Inclusion in agency's Transit Strategic/Development Plan



**SMART
SCALE**

*Funding the Right
Transportation Projects
in Virginia*

Project Evaluation and Scoring

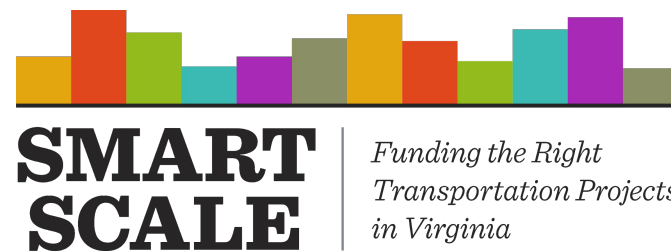
Congestion

- Feedback - concern that current methods do not account for congestion on both weekdays and weekends
- Implement method to better account for peak period congestion throughout entire week (weekdays and weekends)
- Datasource: INRIX dataset
- Approach: For most recent calendar year - calculate the average daily hours the Travel Time Index (TTI) is greater than or equal to 1.5. Use this average daily value to convert the peak hour analysis for delay and throughput to peak period

Congestion- Recommendation for Round 4

- 1) Implement method to better account for peak period congestion throughout entire week (weekdays and weekends)

Congestion



Approach: For most recent calendar year - calculate the average daily hours the Travel Time Index (TTI) is greater than or equal to 1.5. Use this average daily value to convert the peak hour analysis for delay and throughput to peak period

Example calculations

Project	MON	TUE	WED	THU	FRI	SAT	SUN	AVG	Peak Hour Delay	AVG Peak Period Delay
A	2.5	3	3	3	3.5	3	4	3.14	300	942
B	1.5	2	2	1.5	2	1	1	1.57	500	785
C	4	4.5	4.5	4	4.5	2	3	3.79	500	1895

- **SMART SCALE team has been working on the following areas related to safety**
 - **Targeted Crash Modification Factors (CMFs)**
 - **Weighting of S1 (crash frequency) versus S2 (crash rate) - currently 50/50**
 - Recommend changing weight to 70/30
 - Supports Board targets to reduce fatal and injury crashes and pending policy changes related to HSIP program
 - **Increase weight for Safety factor in Area Type A from 5% to 10%**

Safety - Recommendations for Round 4

- 1) For certain project types a targeted CMF will be used
- 2) 70/30 split in weighting - more weight to reduction in crash frequency
- 3) Area Type A - Increase safety weight from 5% to 10%

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

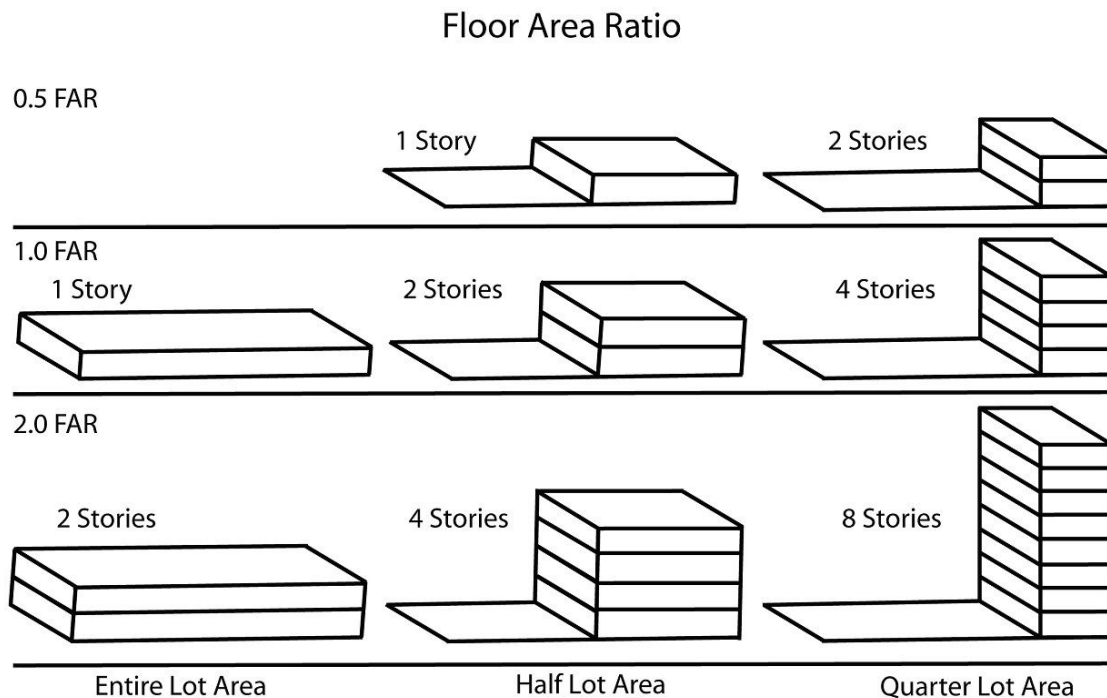


Lowest

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 1 250 acre would equate to 10,890,000 sq ft building
 - **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

Economic Development - Recommendation for Round 4

- 1) FAR for zoned only properties capped at 0.3 unless applicant can prove average FAR around project is higher or minimum FAR in local zoning ordinance is higher than 0.3

Environment

Resource Impact Measure



- Problem: treating measure as a benefit
- Significant potential impact = 0 and No impact = 100
- After lessons of Round 1 - potential impact was then scaled by points in all other measures
- Results can be counter intuitive - if you do not consider \$
- Example - HRBT, which had the second-highest total impact to sensitive resources received the greatest number of points for this measure due to high benefit score

Environment - Recommendation for Round 4

- 1) Convert E1 to subtractive measure (subtracting up to 5 points at end of scoring)
- 2) E2 (Air Quality Energy) measure weight changed to 100%

Environment

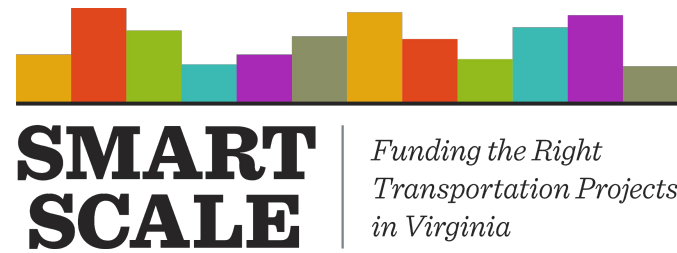
Resource Impact Measure



Proposed method would be subtractive, taking away up to five benefit points based on potential sensitive acres impacted

Project	Description	Impacted Acres	E1 Weighted Score	Benefit Score Before E1	Benefit Score After E1	Requested Amount	SS Score
W	High score, high cost, large footprint	900	-5.00	59.00	54.00	\$ 80,000,000.00	6.75
X	High score, moderate cost, moderate footprint	300	-1.67	26.00	24.33	\$ 15,000,000.00	16.22
Y	Moderate score, moderate cost, large footprint	450	-2.5	6.00	3.5	\$ 40,000,000.00	0.85

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

Land Use - Recommendations for Round 4

- 1) Drop L1 measure and give 100% of weight to L2
- 2) Area Type A - Land Use weight changed from 20% to 15%
- 3) Area Type A = Safety weight changed from 5% to 10%

Treatment of Interstate Projects



- Interstate projects have been outlier projects that have suppressed benefits scores for other investments
- Dedicated funding sources for operational and capacity improvements for Interstates exists now from the 81 legislation
- Should Interstate projects still be eligible for SMART SCALE or should they be handled through the new dedicated Interstate funding?
- Intent is to develop Interstate Corridor Plans for each Interstate
 - I-81 Complete
 - I-95 Underway
 - I-64 to start in January





COMMONWEALTH of VIRGINIA
Office of the
SECRETARY of TRANSPORTATION

Thank you.



HOW THE AGENCY IS LOOKING FORWARD

Commonwealth Transportation Board

VDOT Chief Deputy Commissioner Rob Cary, P.E., L.S.

October 16, 2019

Virginia: A Leading State & A Leading DOT

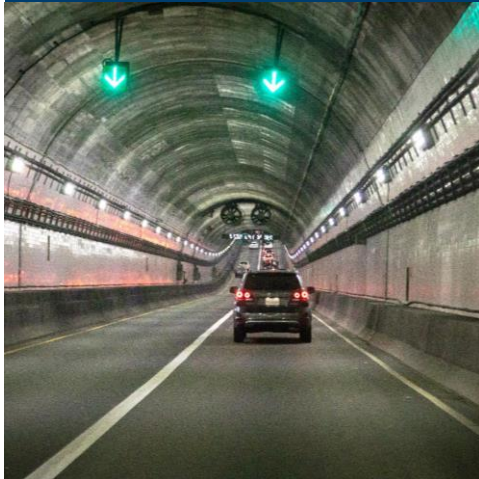
RANKED **#1** BY
CNBC AS THE
2019 TOP
STATE FOR
BUSINESS



7TH IN NATION
FOR THE # OF
FORTUNE
1000
COMPANIES



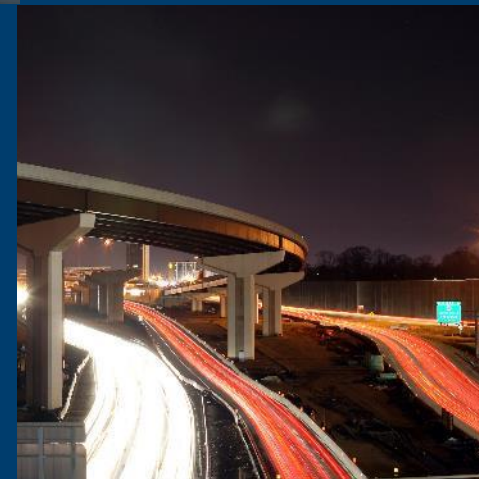
HOME TO
MORE THAN
60 COLLEGES
AND
UNIVERSITIES



8.5 MILLION
CITIZENS



VIRGINIA HAS
THE **3RD**
LARGEST
STATE MAINT.
HIGHWAY
SYSTEM



Leadership Team + Organizational Changes

- ✓ Comprehensive assessment of executive-level team
- ✓ Seeking alignment with service + program delivery
- ✓ New roles + new structure + new opportunities
- ✓ Key internal talent
- ✓ Building the agency of the future
- ✓ Instilling confidence in the opportunity to succeed at VDOT

Organizational Changes

Chief of Maintenance and Operations
Reporting to Chief Deputy Commissioner

- **Maintenance**
- **Operations**
- **Land Use**
- **Asset Management**
- **Traffic Engineering**

Chief Engineer
Reporting to Commissioner

- **Construction**
- **Location and Design**
- **Materials**
- **Structure and Bridge**
- **Alternative Project Delivery**
- **Transportation and Mobility Planning**

Districts

Reporting to Chief Deputy Commissioner

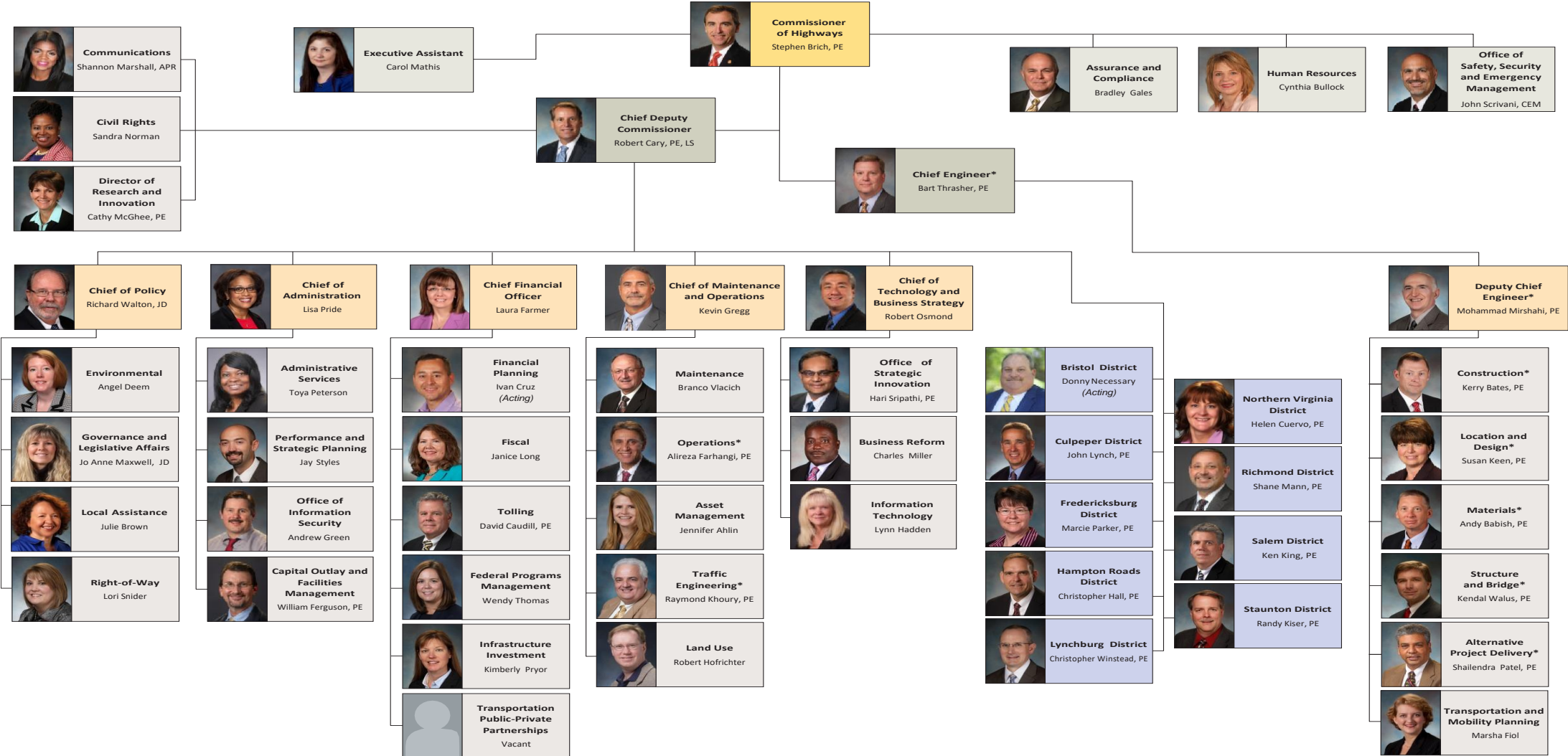
Organizational Changes



ORGANIZATION CHART

October 2019

* Designates positions requiring professional engineering license



VDOT of Tomorrow: Project Research + Engagement

12 Focus groups 

27 Skills identified as critical 

4 Advisory Board meetings 

2 Stakeholder briefings

10 Strategic Initiatives 

1 Project microsite

8 Leadership interviews

24 Lab participants 

70 Change Champions

1 Employee Survey 

7,800 Employees

2 Years 

VDOT of Tomorrow | How We Get There

1

PREPARE OUR PEOPLE



- Develop the workforce
- Identify gaps
- Build and sustain expertise

2

EMPOWER INNOVATION



- Challenge the norm
- Create
- Adapt
- Think differently

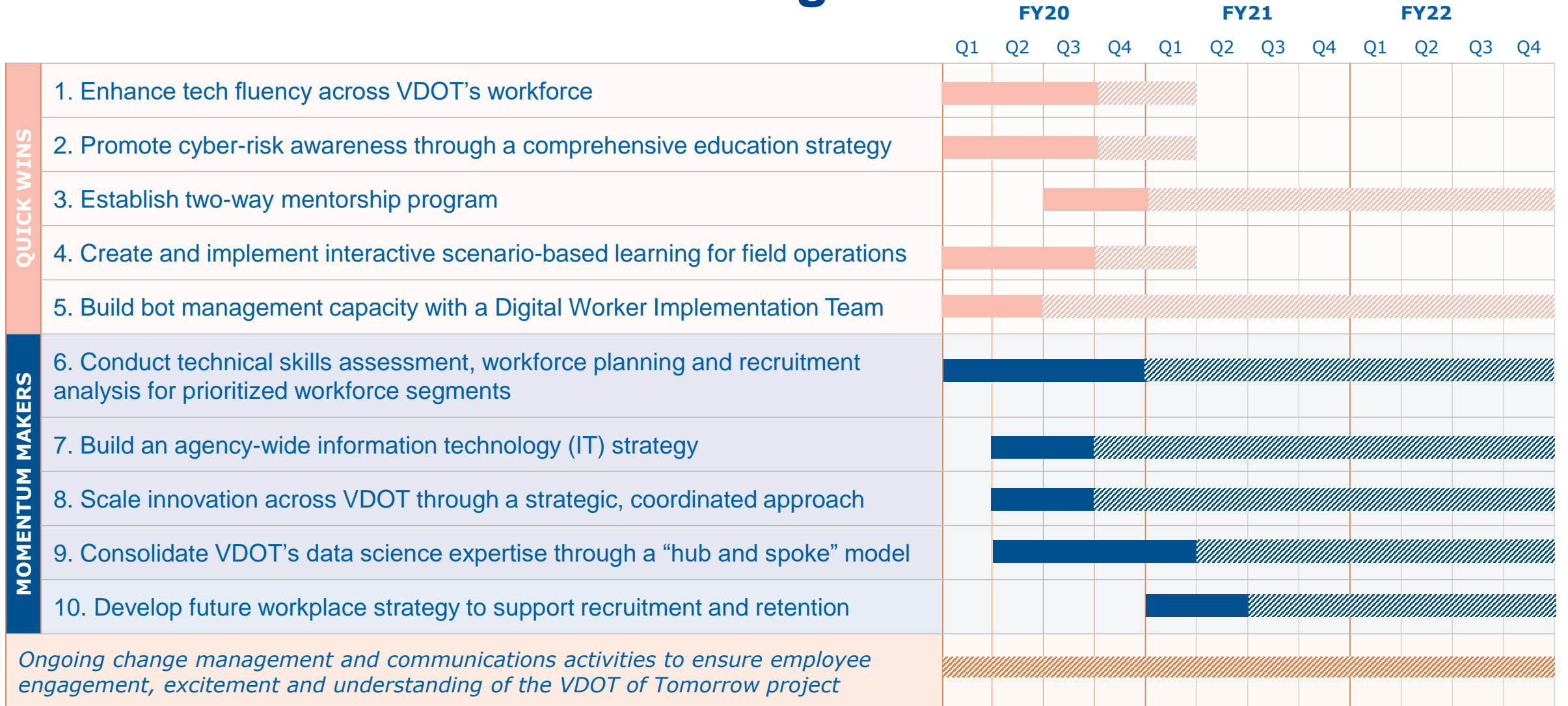
3

MODERNIZE OUR METHODS



- Improve processes
- Create efficiencies
- Modernize procedures
- Update strategies

VDOT of Tomorrow: 10 Strategic Initiatives



VDOT Employee Survey Results Fall 2019

VDOT Employee Survey: At-A-Glance

- **21 questions** on the survey
- Conducted for **2.5 weeks** during summer 2019
- **4,178 out of 7,957 recipients (53%)** took the survey across all residencies, districts, Central Office and staff level

Survey Themes

- Future Readiness:** Outlook on future of work and the work environment
- Change Management and Culture:** Outlook on careers as work evolves
- Human Skills:** Level of comfort and confidence with critical human skills

Key Takeaways

Survey respondents feel..

- **Generally positive** about their work life at VDOT
 - **Prepared** to do their **jobs today**
- But survey respondents also feel...
- **Excited yet underprepared** for the **future changes** to their jobs
 - The need for **more training** to help them prepare

Note: All statistics reflect responses by survey respondents.

The Top 3 Skills that VDOT Employees Want to Learn:



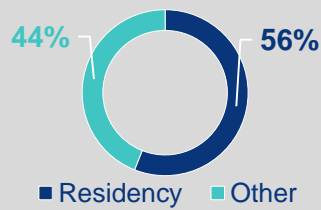
Leadership Skills

1
2

Computer Skills

3
Communication Skills

Rated Computer Skills as Top Skill to Learn



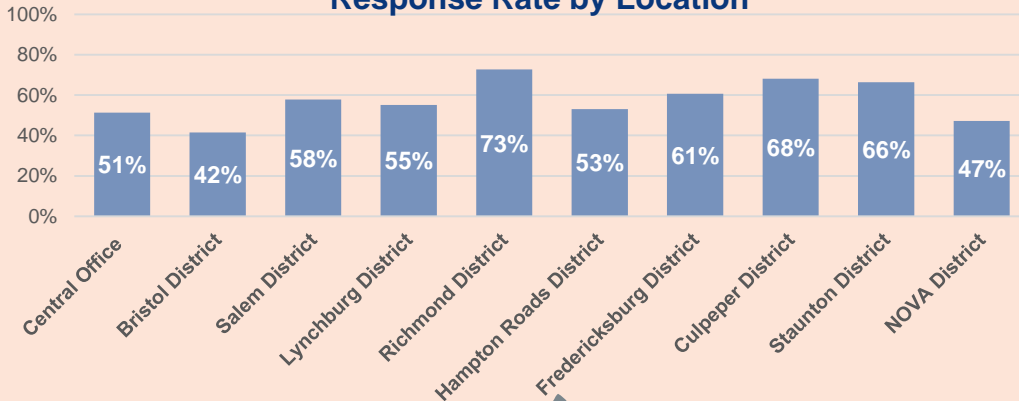
53%

of VDOT employees took the survey

82%

agree that they are excited for the future of their career at VDOT

Response Rate by Location



Readiness for Today

98%

agree that they have skills that are valuable to VDOT today



95%

agree that they feel prepared to do their jobs today

Readiness for Tomorrow

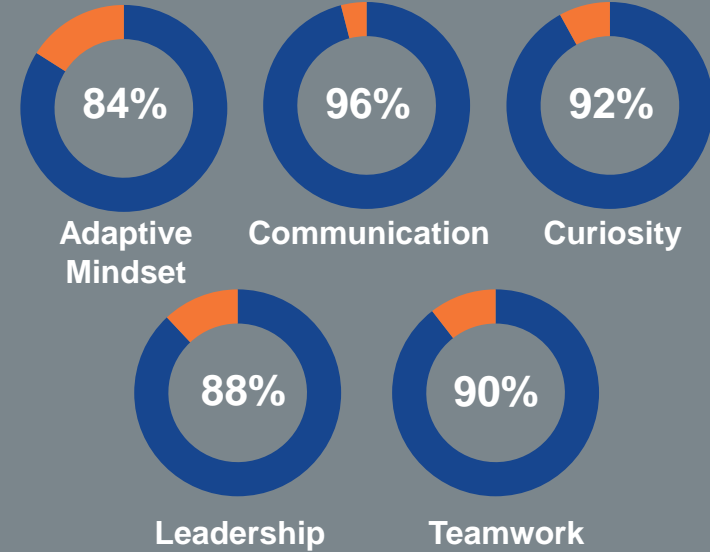
94%

believe that they have skills that will be valuable to VDOT as technology and transportation change

84%

feel prepared for changes in their jobs that may come in the next 5 to 10 years

Confidence in Using Human Skills on the Job



“There’s unrealistic expectations on new VDOT employees. There’s no training about VDOT and/or the divisional needs.”



-Survey Respondent

One of the three core goals of the VDOT of Tomorrow is to prepare our people for the future. Check out the below resources to learn more...



VDOT U Trainings



VDOT of Tomorrow Site



Speak with your HR rep

*When asked to describe their work life at VDOT in one word, survey respondents used generally positive words as indicated by the word cloud below.**



*The size of the word corresponds with the frequency with which the word was submitted as the response.



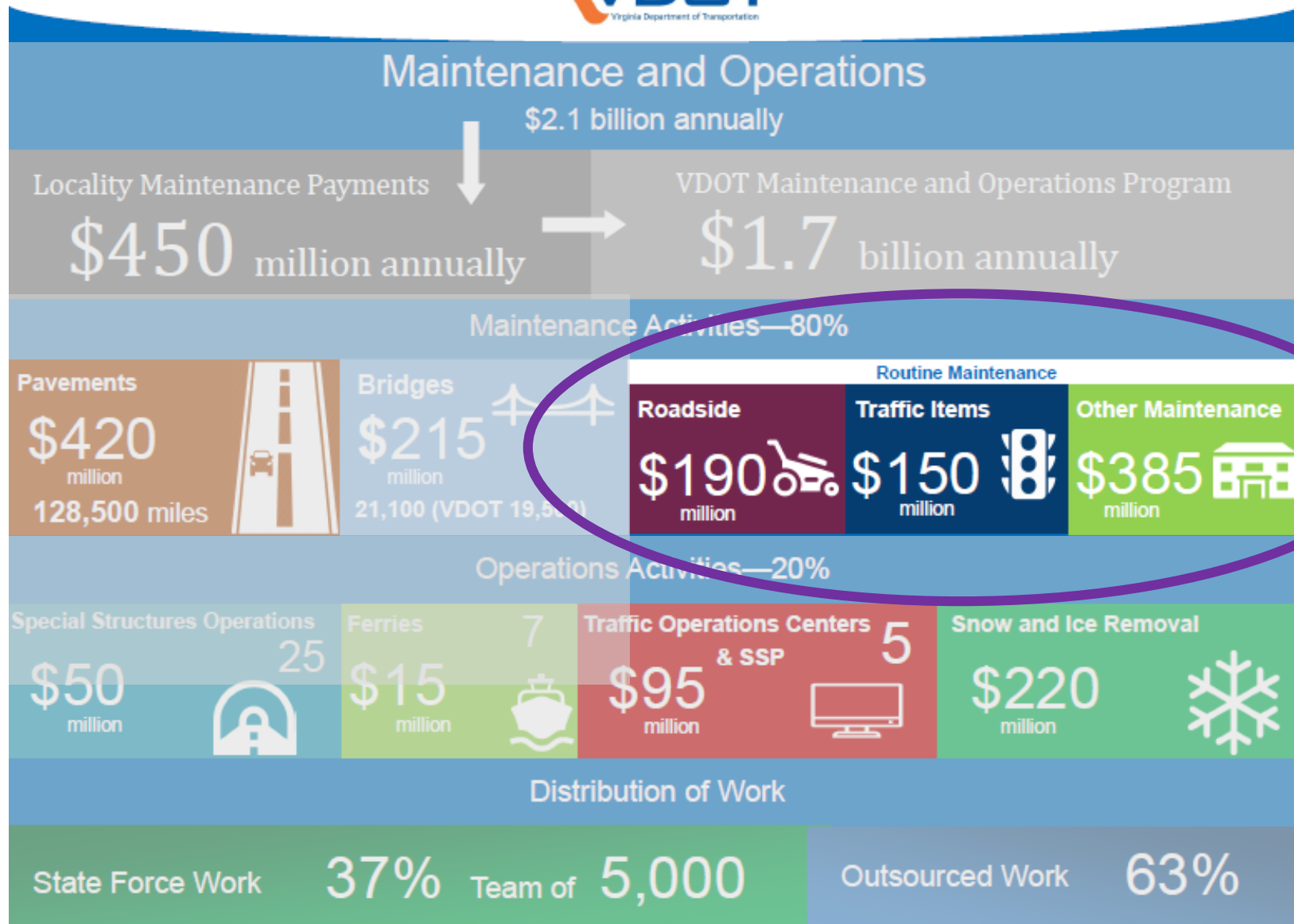




COMPREHENSIVE REVIEW ROUTINE MAINTENANCE

 Stephen C. Brich, P.E., Commissioner of Highways

October 16, 2019



Note: Funding and Activities based on previous three fiscal year averages (FY 2016 – FY 2018); numbers are rounded to the nearest \$5 million

Routine Maintenance

VDOT – Work Areas

Central Office: 1

Districts: 9

Residencies: 31

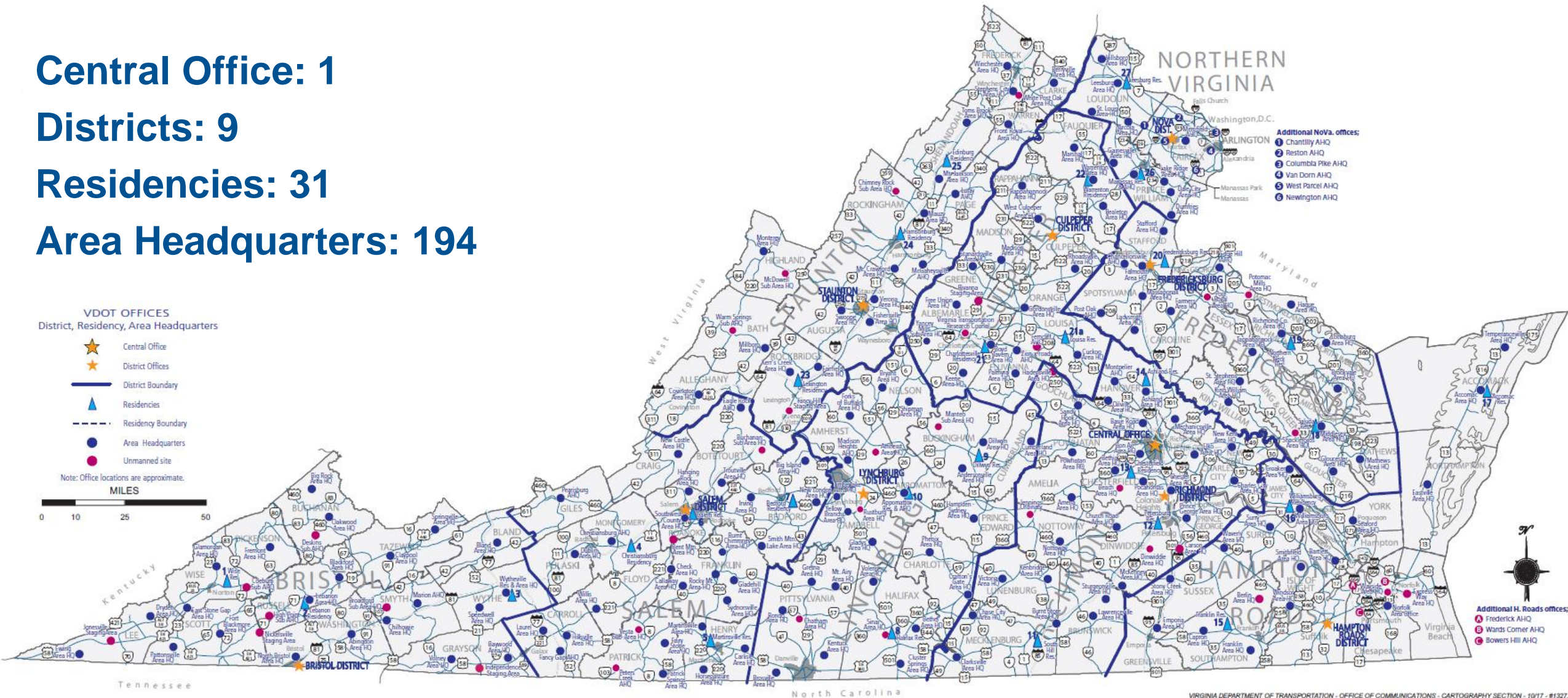
Area Headquarters: 194

VDOT OFFICES
District, Residency, Area Headquarters

- ★ Central Office
- ★ District Offices
- District Boundary
- ▲ Residencies
- - - Residency Boundary
- Area Headquarters
- Unmanned site

Note: Office locations are approximate.

MILES



- Additional NoVa. offices:
- 1 Chantilly AHQ
 - 2 Reston AHQ
 - 3 Columbia Pike AHQ
 - 4 Van Dorn AHQ
 - 5 West Parcel AHQ
 - 6 Newington AHQ

- Additional H. Roads offices:
- A Frederick AHQ
 - B Wards Corner AHQ
 - C Bowers Hill AHQ

Routine Maintenance – Current Practice

Currently balancing planned versus unplanned work

Deferred work

- Sound walls/fences
- Night sign inspection for replacements
- Daylighting of signs
- Ditching
- Maintenance of closed drainage facilities

Area Headquarters

- Salaries
- Equipment
- Average materials cost: ~ \$20,000 per month

Budget Distribution

9 Districts

Bristol

Salem

Lynchburg

Richmond

Hampton Roads

Fredericksburg

Culpeper

Staunton

NOVA

31 Residencies

Ashland

Chesterfield

Petersburg

South Hill

194 AHQ

Amelia

Beach

Bethia

Bon Air

Chester

Pocahontas

Powhatan

Routine Maintenance – Back to Basics

Need to move to a proactive approach to provide:

- **Efficiencies through a planned and systematic approach**
- **Extended life of assets and limit the unavailability**
 - **Most assets are interdependent**

Performance Metrics in coordination with the best practices have been developed

Asset	Service Request Calls 2015	Service Request Calls 2019	Service Request Increase since 2015	Activity Example
Vegetation	17,300	30,400	76%	Removing vegetation impeding visibility, mowing, trees
Drainage	20,000	29,500	48%	Clearing standing water or blocked pipes, cleaning
Unpaved Roads	10,700	12,800	20%	Address rutting or water damage
Signs	3,500	7,500	114%	Replace damaged sign
Signals	4,900	7,000	43%	Attend to outages, malfunctions

Routine Maintenance – Long Term Sustainability

Analysis undertaken to define Performance Metrics and targets

- A number of activities selected based on:
 - Safety items
 - Highest expenditures
 - Most publicly visible
 - Extend the life of other assets
 - Service requests
- Targets are benchmarks and some not immediately achievable



Routine Maintenance – 2019 Performance Metrics

Asset	Best Practice Frequency	Current Frequency Average / Year	2019 Target Frequency
Turf (Mowing)	3 times / year	IS: 3.1 times / year PR: 3.1 times / year SC: 2.3 times/ year	IS: 3 times / year PR: 3 times / year SC: 2 times/ year
Trees	10% of inventory	5% of inventory	6% of inventory
Pipes	20% of inventory	8% of inventory	10% of inventory
SWM Facilities	2 times / year	1.67 times / year	2 times / year
Ditches	20% of inventory	3% of inventory	5% of inventory
Unpaved Roads	4 times / year	5 of inventory	4 times / year
Unpaved Shoulders	20% of inventory	16% of inventory	20% of inventory
Signs	7% of inventory	4% of inventory	5% of inventory
Signals	5 year cycle	4% of inventory	5 year cycle
Pavement Marking	Material dependent	64% of inventory	70% of inventory

Maintenance and Operations – Labor and Benefits

Maintenance and Operations Program

- **Employees: over 7,700**
 - **Maintenance ~ 4,800**
 - **62% work force**
- **Labor and benefits: 23% average of annual budget**
- **Budget 17% change over 6 years**

Labor and Benefits

- **20% increase over 6 Years (FY 2014 – 2019)**
 - **Salaries 14% increase over 6 years**
 - **Health Insurance Premium 39% increase over 6 Years**
 - **Retirement Contribution Defined Benefit 60% change over 6 Years**

Maintenance and Operations Program - Flexibility

Dynamic Maintenance Needs

- Annual inventory additions
 - Lane miles
 - Trails

Emergencies

- Extreme weather events
 - Snow and ice
 - Hurricanes
 - Floods
- Unexpected events
 - Bridge hits
 - Sinkhole
 - Traffic impeding objects
 - Unfunded mandates



Need to Retain Flexibility

Routine Maintenance Summary

What is Funding Needed Today? \$0

Back to Basics

- **Proactive approach**
 - Reduce number of service requests
 - Extend life of assets
 - Continue to create efficiencies in processes
 - Equipment (e.g., lease vs own)
 - Materials (e.g., concrete vs. plastic pipes)
 - Repair process choices (e.g., soil nails vs rip rap slope protection)
 - Transparency
- **Annual reporting**



Comprehensive Review Timeline

Description	Date
Special Structures/Comprehensive Review and Approval Request	November 2019
Submission of Comprehensive Review Report to General Assembly	December 2019
Periodic Reporting and Reassessment	Begin in 2020



HAMPTON ROADS REGIONAL NETWORK OPERATIONAL STUDY – PRELIMINARY RESULTS

Stephen C. Brich, P.E. – VDOT Commissioner

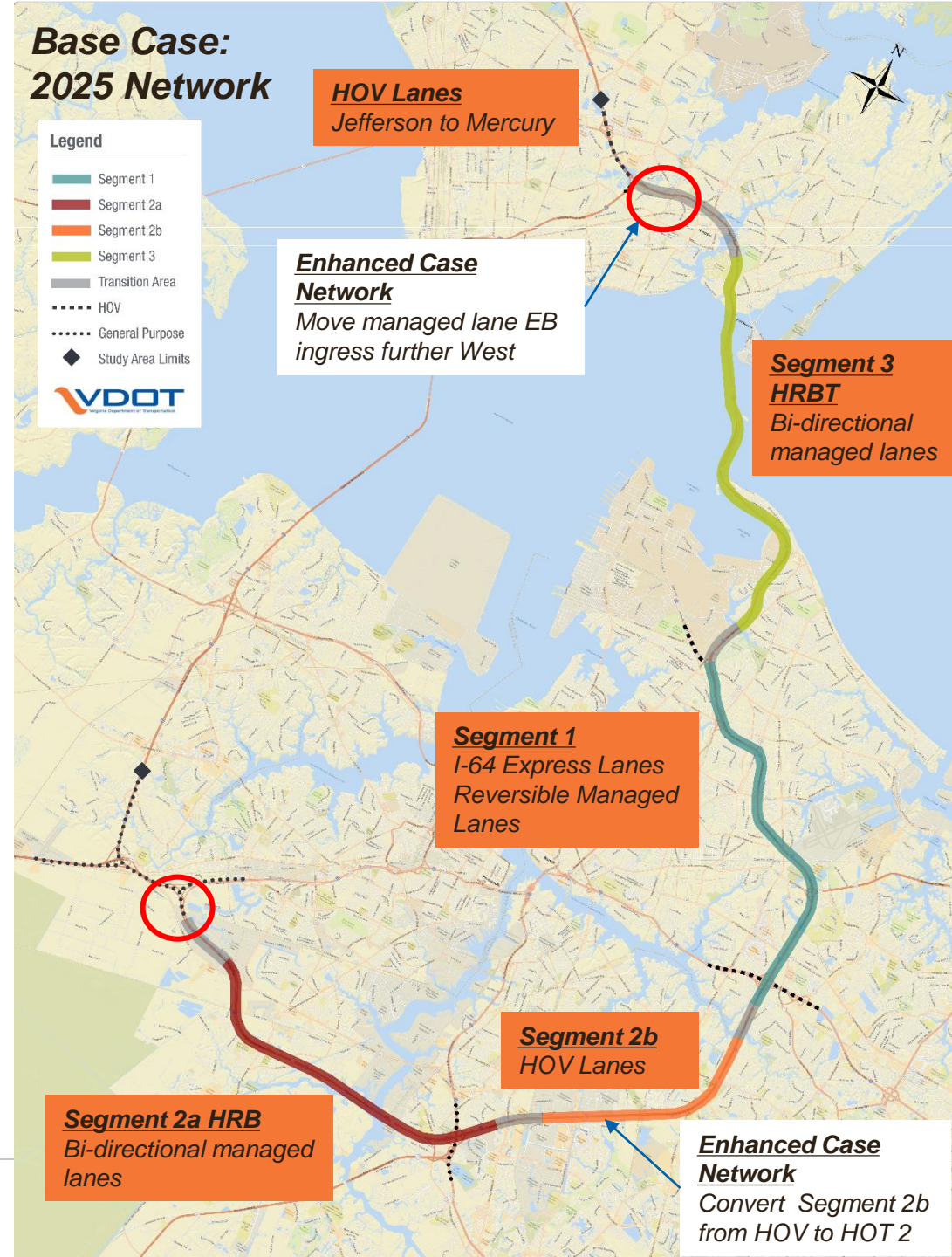
October 16th, 2019

Overview of Need for Study

- **Major Regional Investments/Improvements**
 - High Rise Bridge
 - Hampton Roads Bridge Tunnel Expansion
 - I-64 Express Lanes
- **Have not viewed network as system**
- **Informed decisions for Master Tolling Agreement**

Background

- **Initiated Operational Analysis December 2018**
 - Base Case
 - Enhanced Case
- Understand potential impacts of increased capacity
- Identify potential future operational challenges
- Evaluate system performance
 - GP travel times and speeds
 - Managed Lane travel times and speeds



Outcome from Initial Analyses

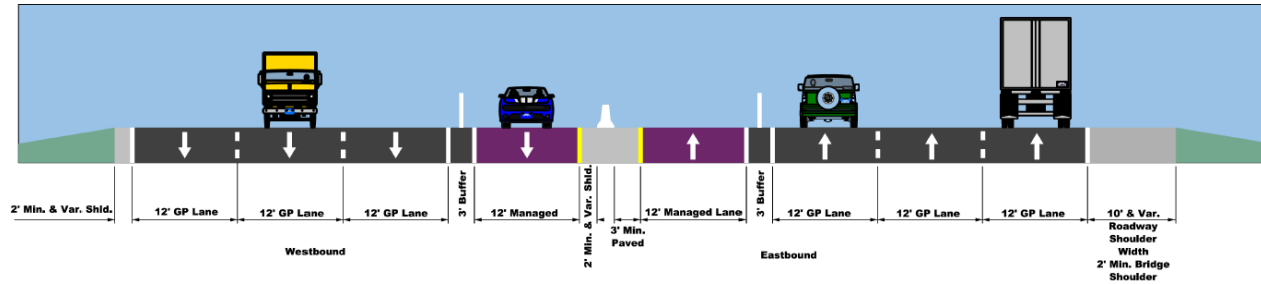
- **Verified investments have major positive impact**
 - **Faster travel time for GP and Managed Lanes**
 - **Less congestion in GP**
 - **Creates reliable system**
- **Identified 5 hot spot locations**
- **Operations significantly improve by moving Hampton sort location west**
- **Developed Proposed Scenario**
 - **Opportunity to repurpose shoulder (Norfolk)**
 - **Investigate repurposing HOV lane on Peninsula**

Proposed Scenario

Jefferson to LaSalle:

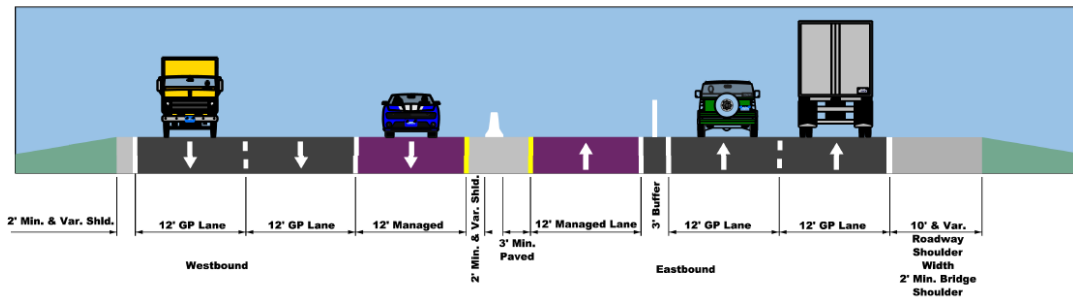
- Between Jefferson & Mercury – HOV2 to HOT2

Proposed Interstate 64



- Between Mercury & LaSalle – HOT2 (1 ML)

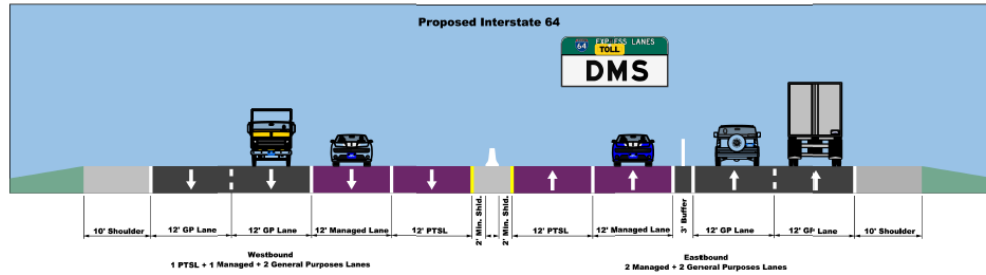
Proposed Interstate 64



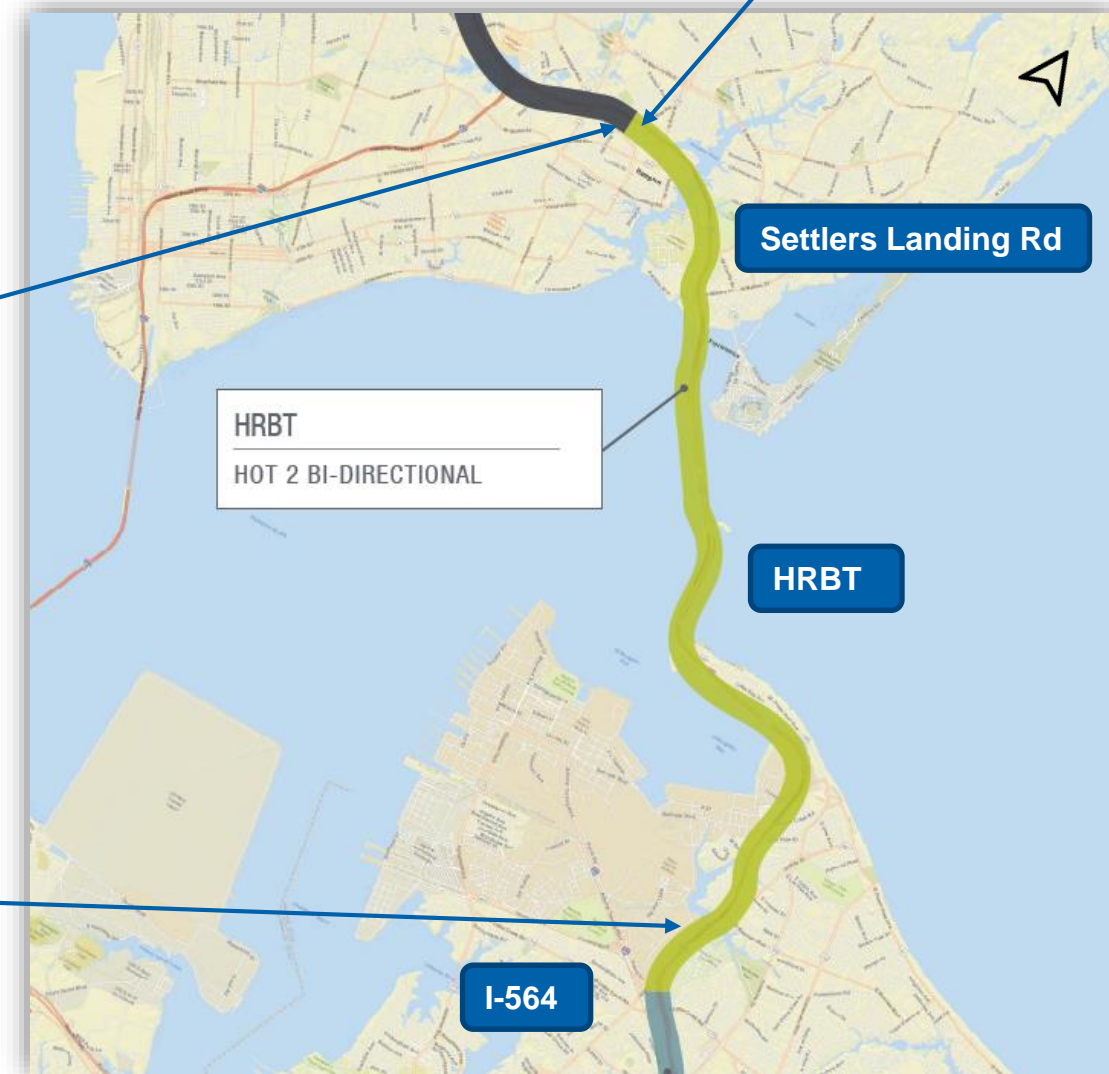
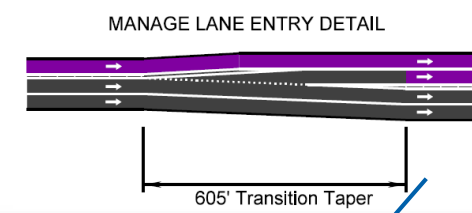
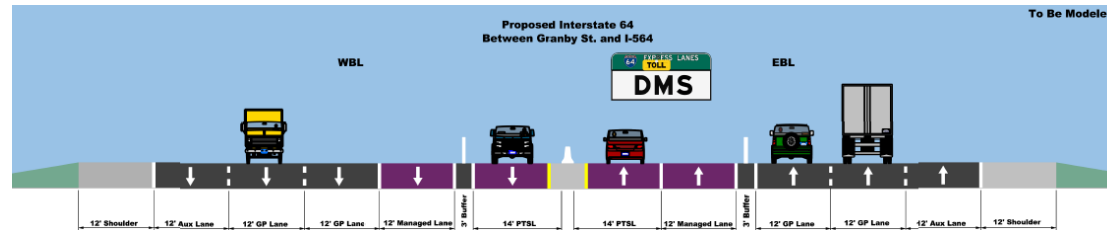
Proposed Scenario

HRBT:

- HOT3 to HOT2
- Shift Eastbound & Westbound Ingress/Egress from Settlers Landing Rd to LaSalle Ave (2 ML)



- Provide 2 lane Ingress/Egress along I-64 Eastbound (at LaSalle Ave) and I-64 Westbound (at Granby St)

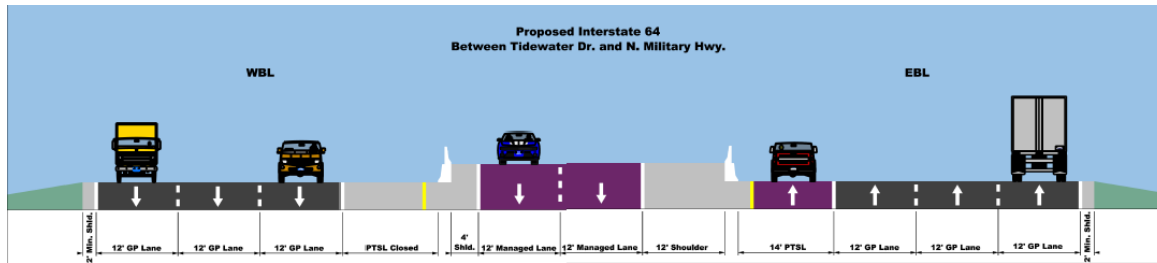


Proposed Scenario

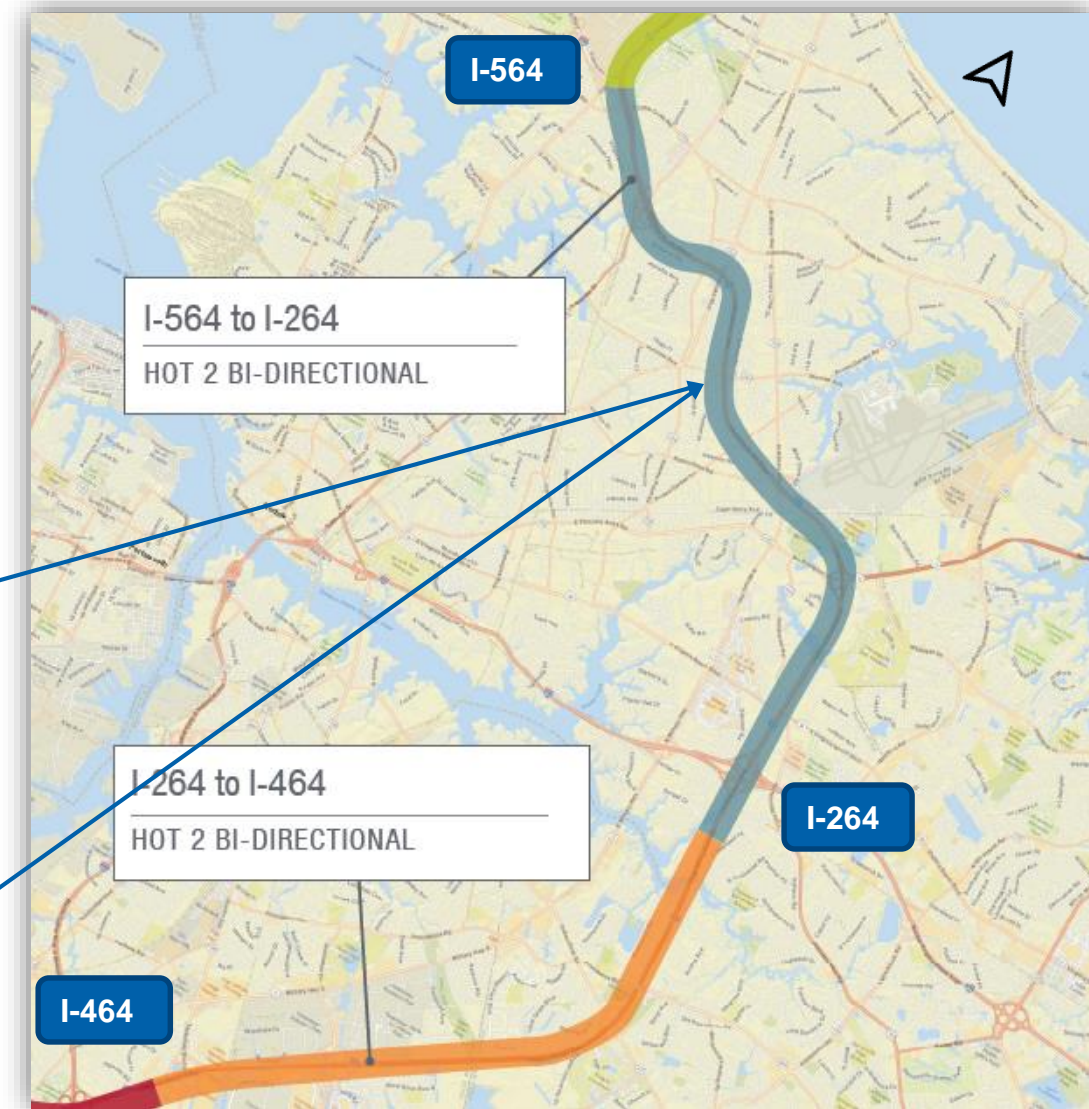
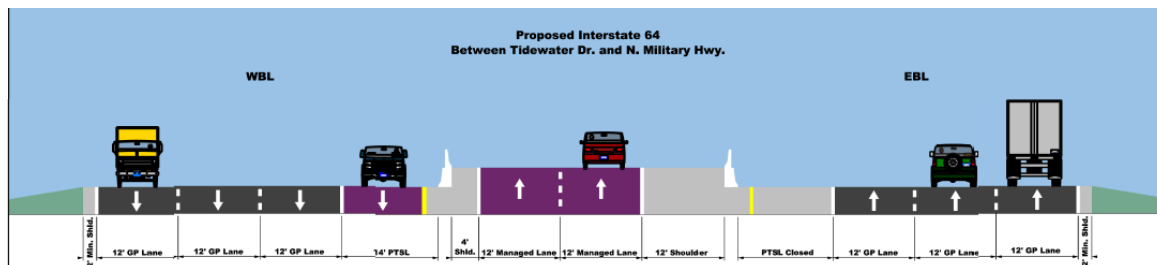
I-564 to I-264:

- HOT2 Reversible in median
- HOT2 PTSL along GP (opposite direction to reversible median lanes)

• AM Peak:



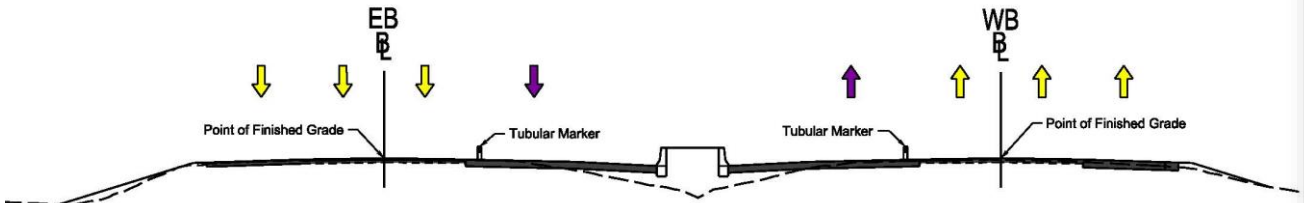
• PM Peak:



Proposed Scenario

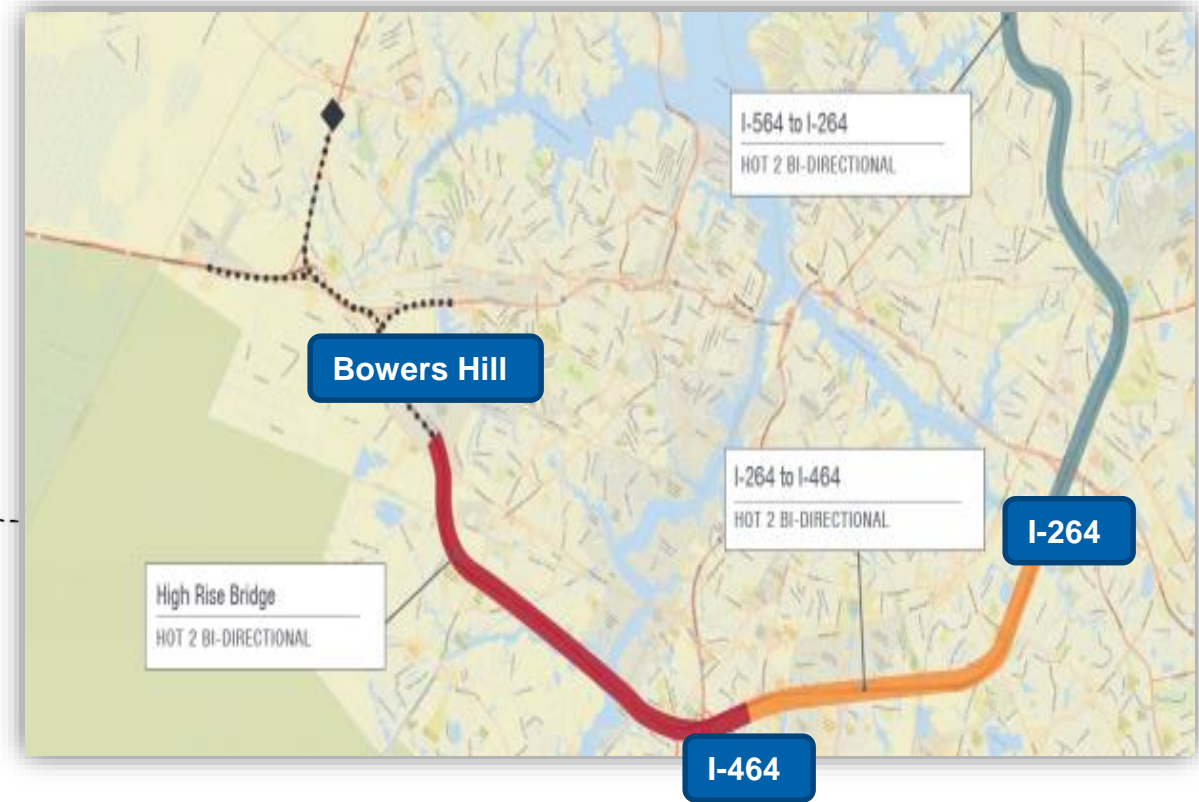
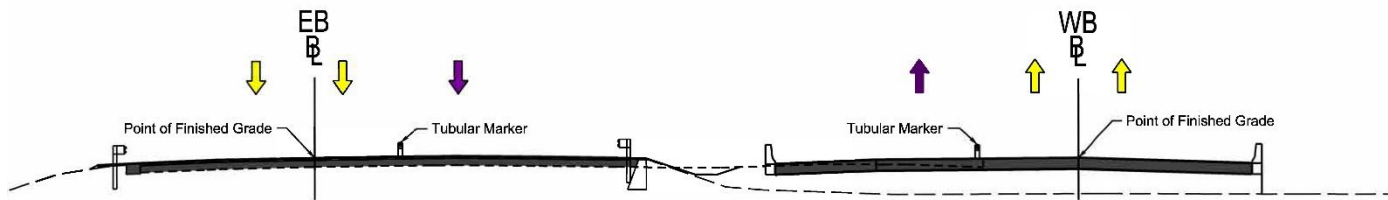
I-264 to I-464:

- Convert HOV to HOT2



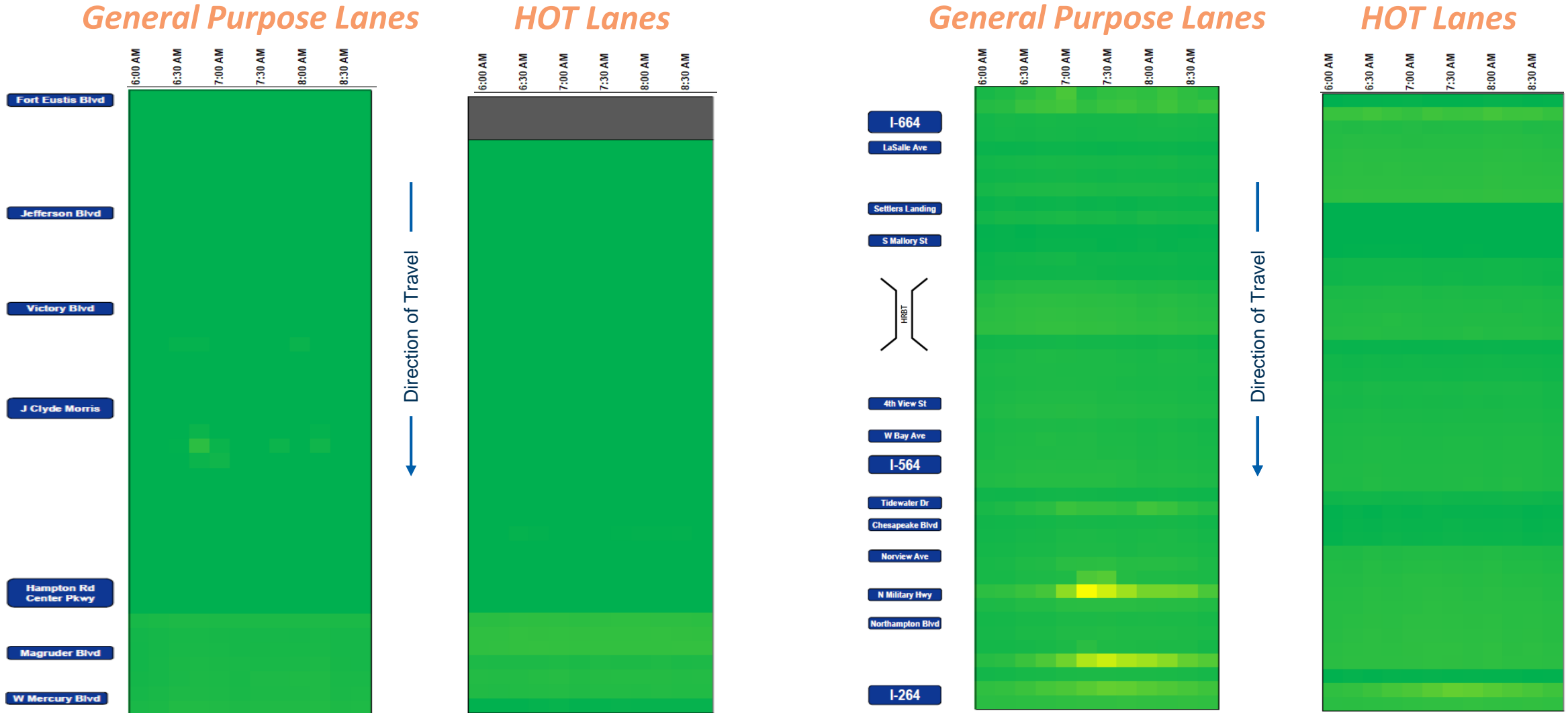
I-464 to Bowers Hill:

- HOT2 (single lane) and 2 General Purpose Lanes



Speed Comparison East Bound 2025 AM: Proposed Scenario

(Fort Eustis Blvd to I-264)

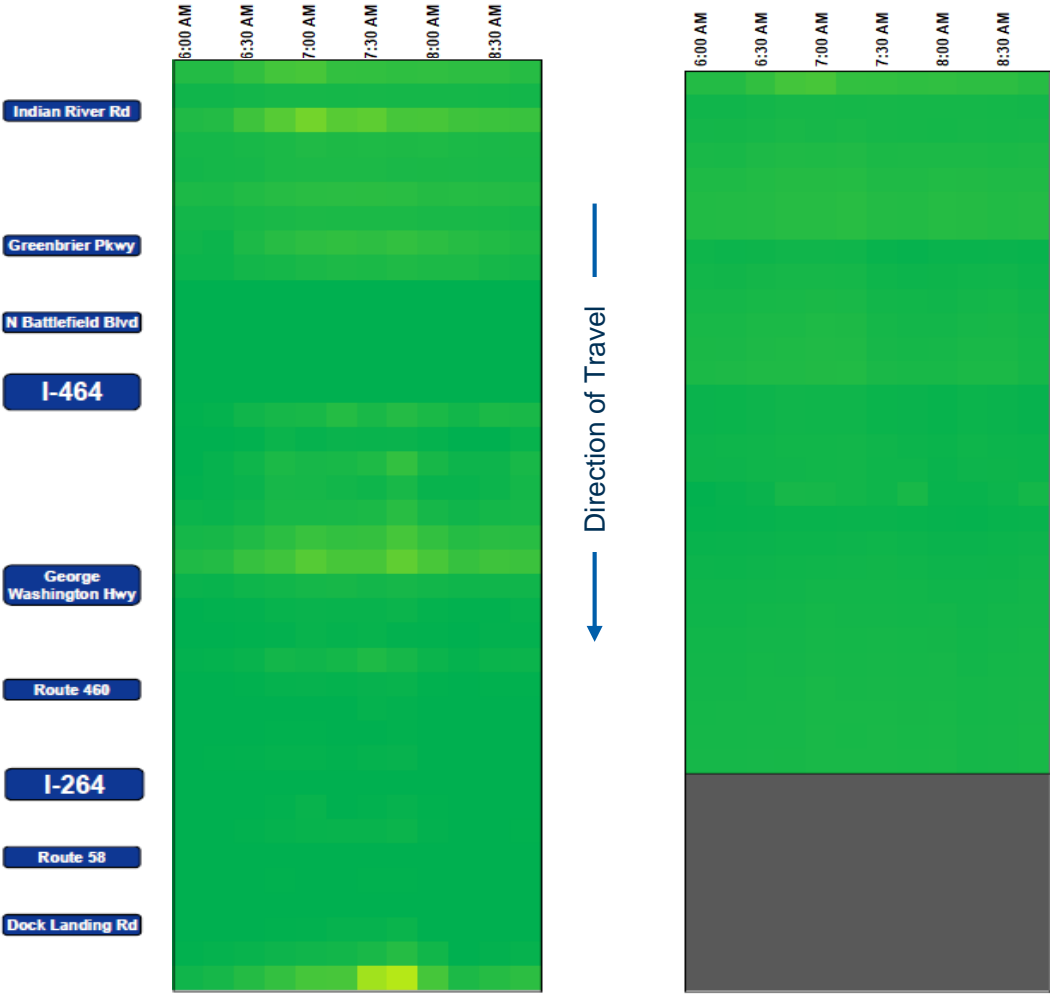


Speed Comparison East Bound 2025 AM: Proposed Scenario

(I-264 to Dock Landing)

General Purpose Lanes

HOT Lanes



Speed Comparison West Bound 2025 AM: Proposed Scenario

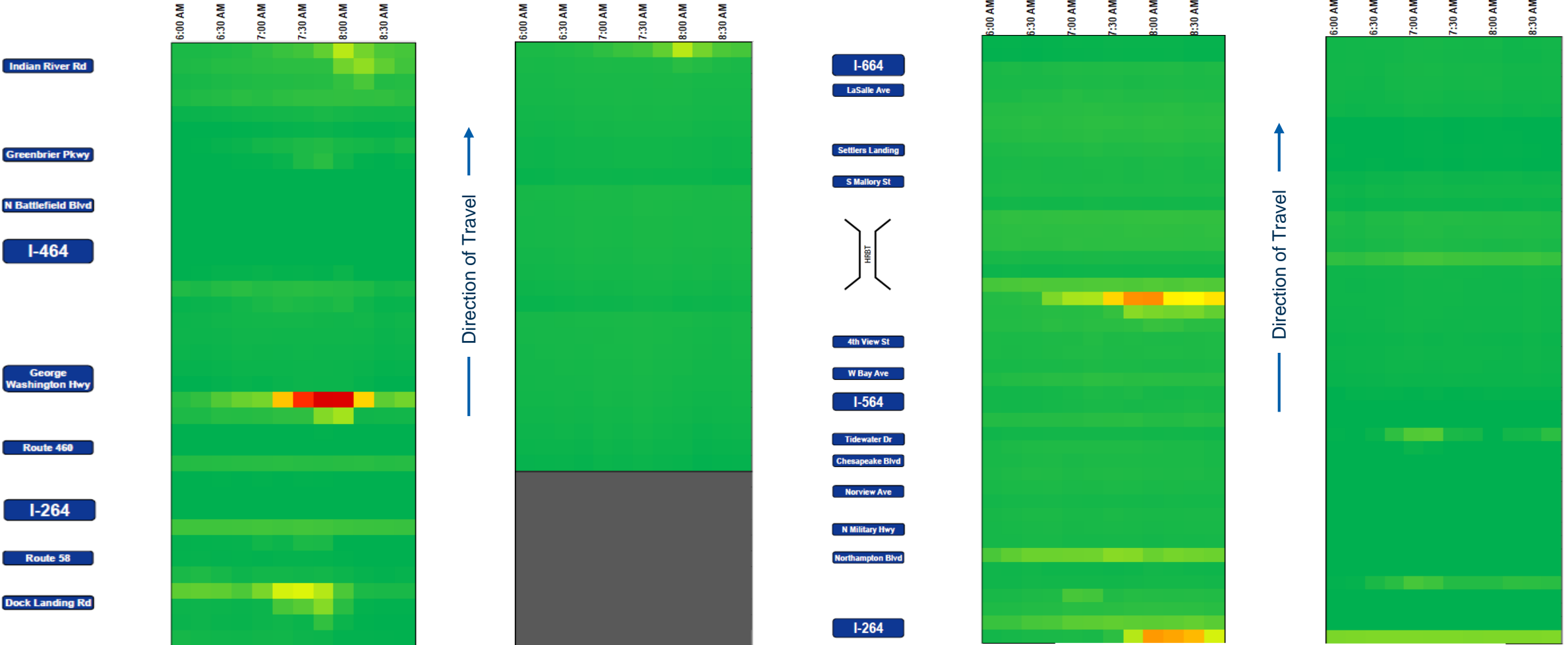
(Dock Landing to I-664)

General Purpose Lanes

HOT Lanes

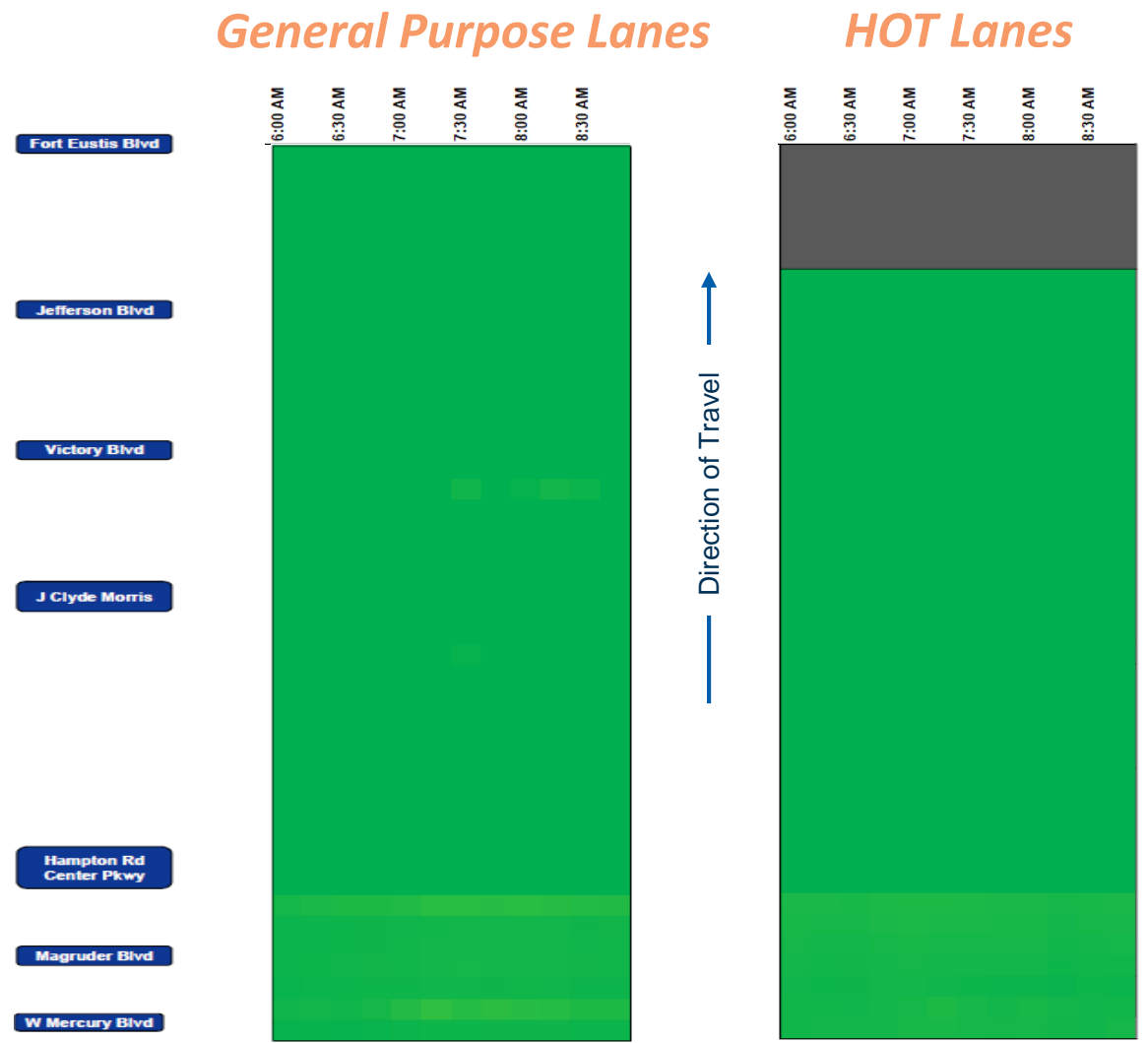
General Purpose Lanes

HOT Lanes



Speed Comparison West Bound 2025 AM: Proposed Scenario

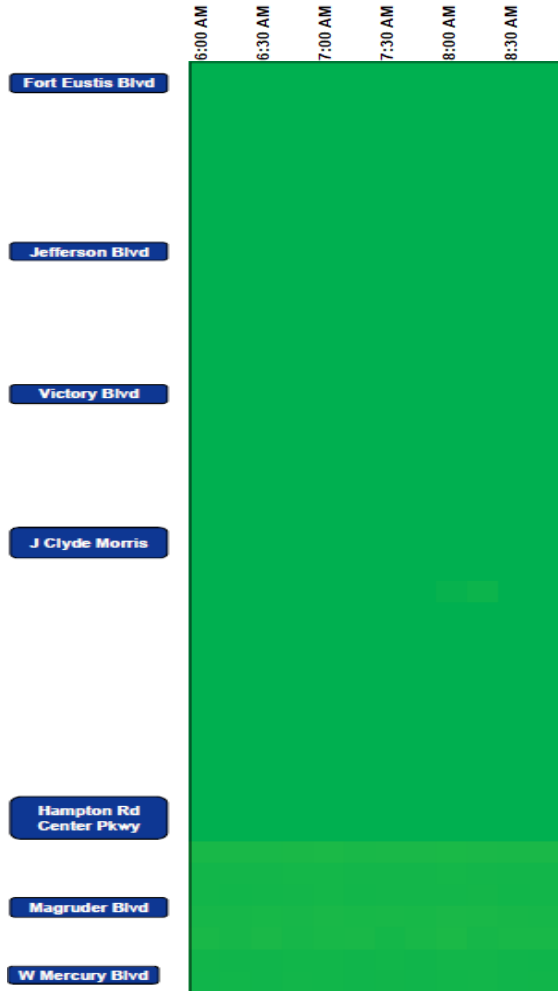
(West Mercury Blvd to Fort Eustis Blvd)



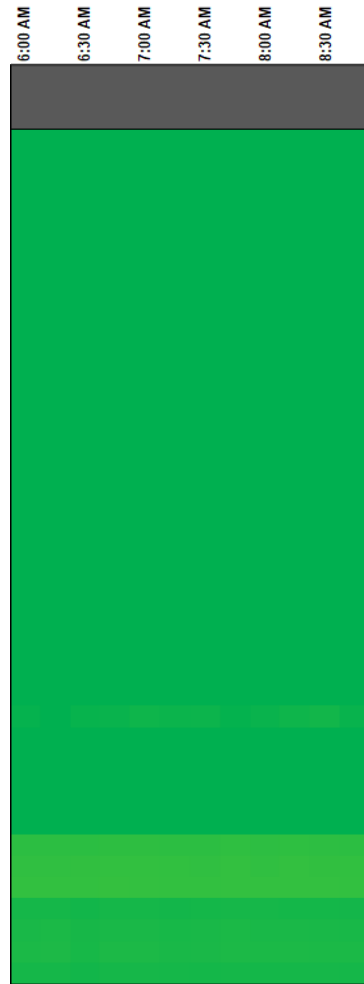
Speed Comparison East Bound 2025 PM: Proposed Scenario

(Fort Eustis Blvd to I-264)

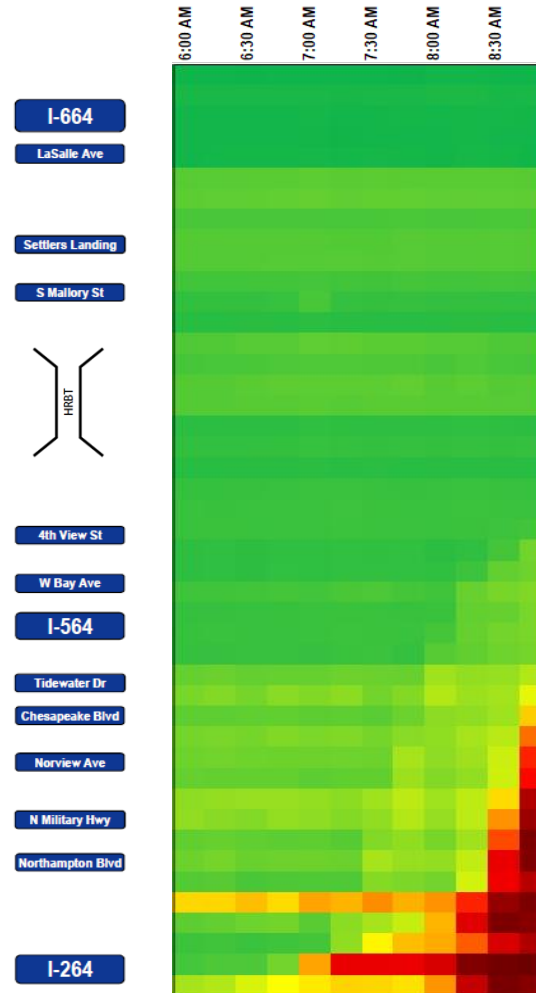
General Purpose Lanes



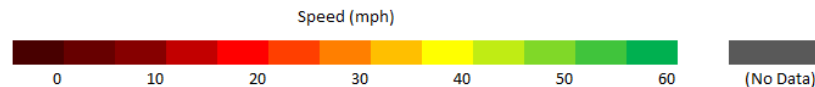
HOT Lanes



General Purpose Lanes



HOT Lanes

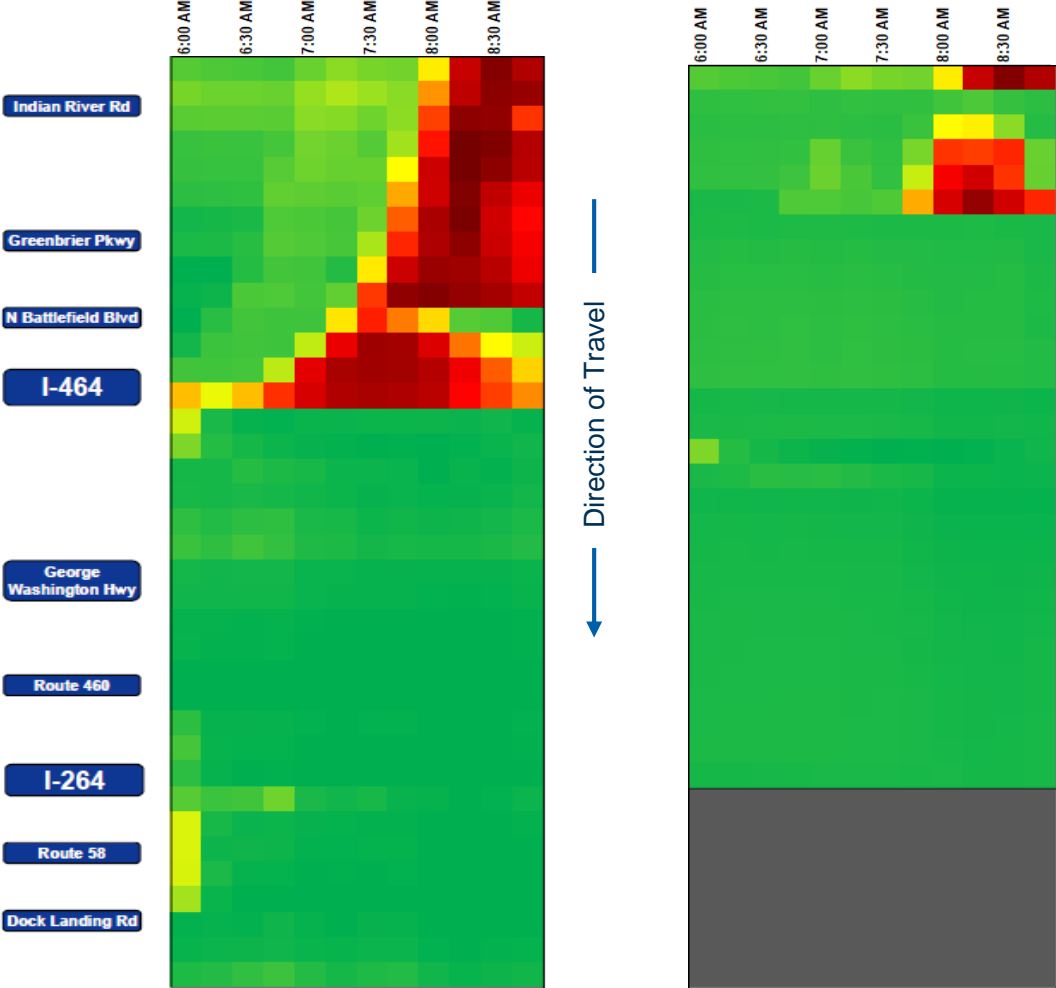


Speed Comparison East Bound 2025 PM: Proposed Scenario

(I-264 to Dock Landing)

General Purpose Lanes

HOT Lanes



Speed Comparison West Bound 2025 PM: Proposed Scenario

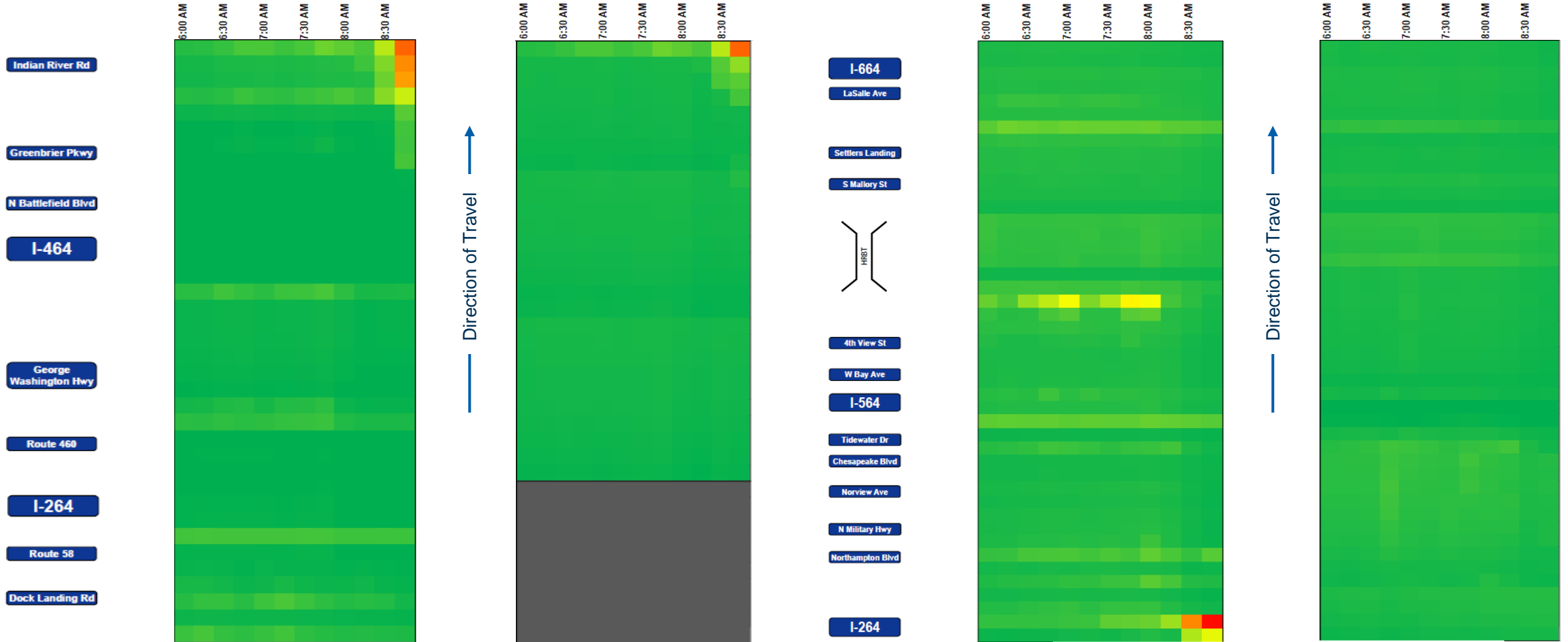
(Dock Landing to I-664)

General Purpose Lanes

HOT Lanes

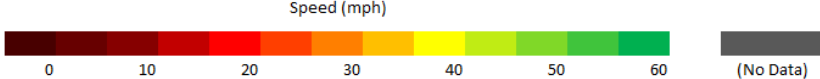
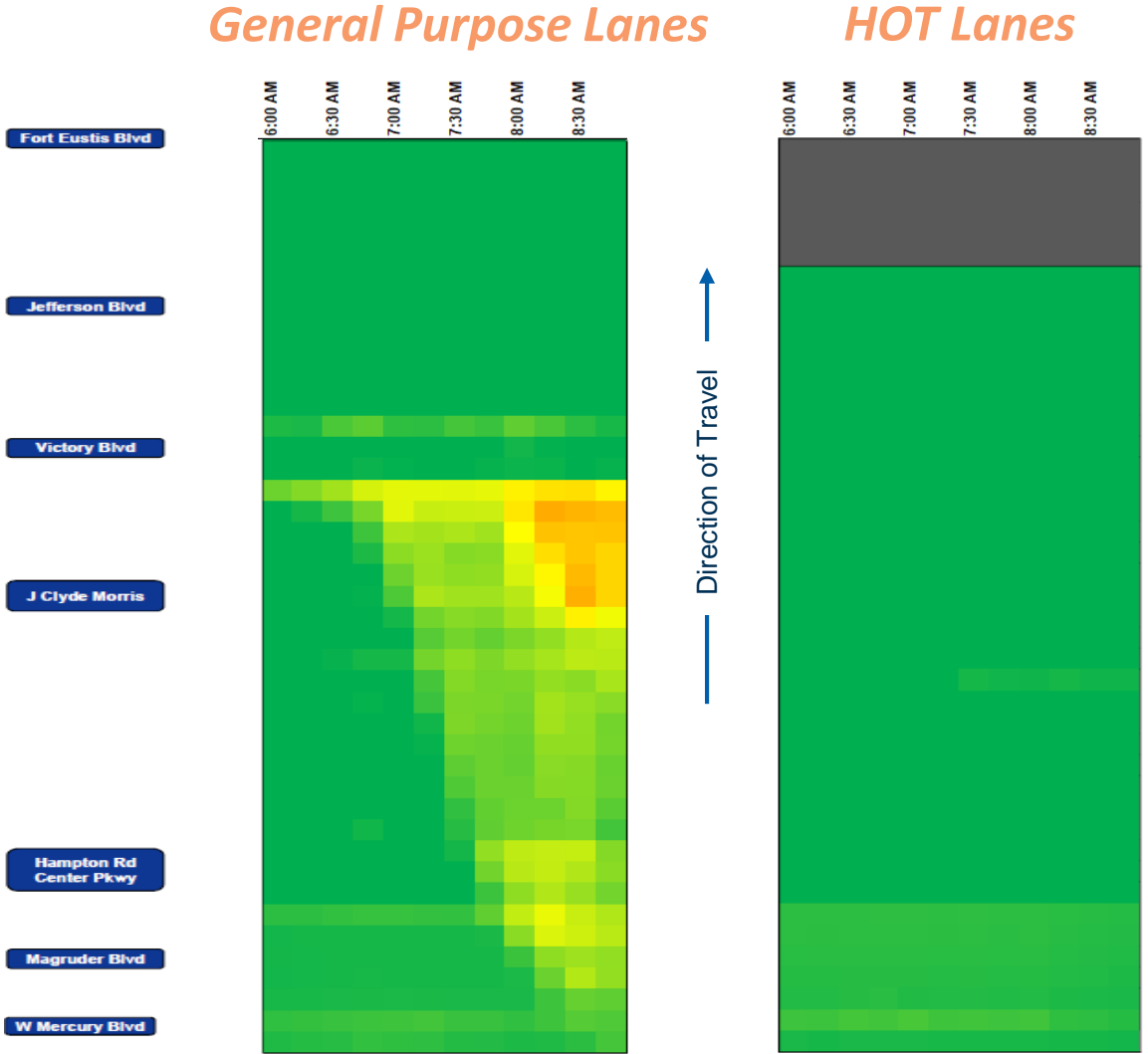
General Purpose Lanes

HOT Lanes



Speed Comparison West Bound 2025 PM: Proposed Scenario

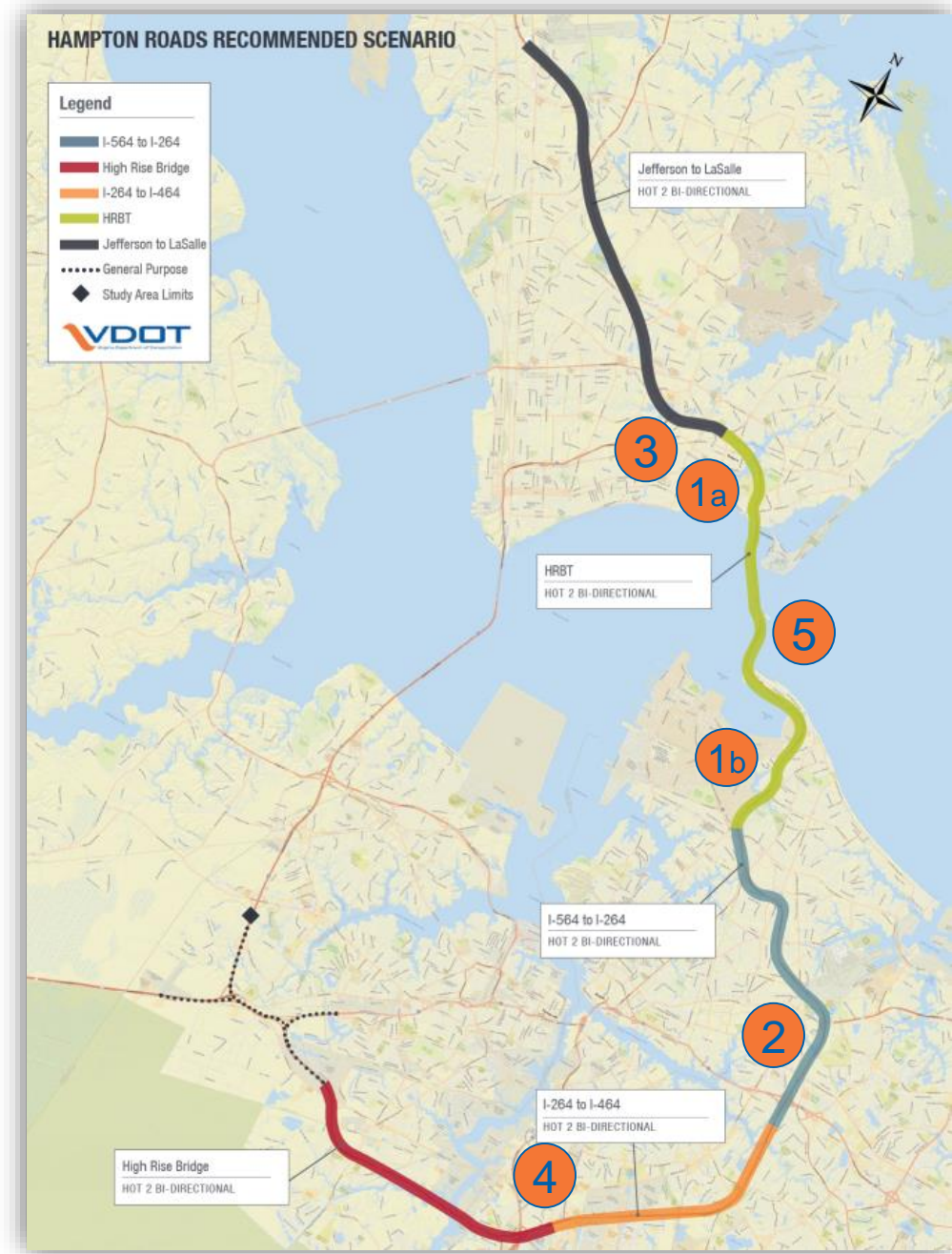
(West Mercury Blvd to Fort Eustis Blvd)



Operational Analysis Results (2025)

Maximize the investment by addressing Interstate Network Hot Spot Locations:

1. 2025 AM I-64 EB at HRBT
2. 2025 AM I-64 EB at I-564 to I-264
3. 2025 PM I-64 EB at HRBT
4. 2025 PM I-64 EB at I-564 to I-264 & High Rise Bridge
5. 2025 PM I-64 WB at HRBT

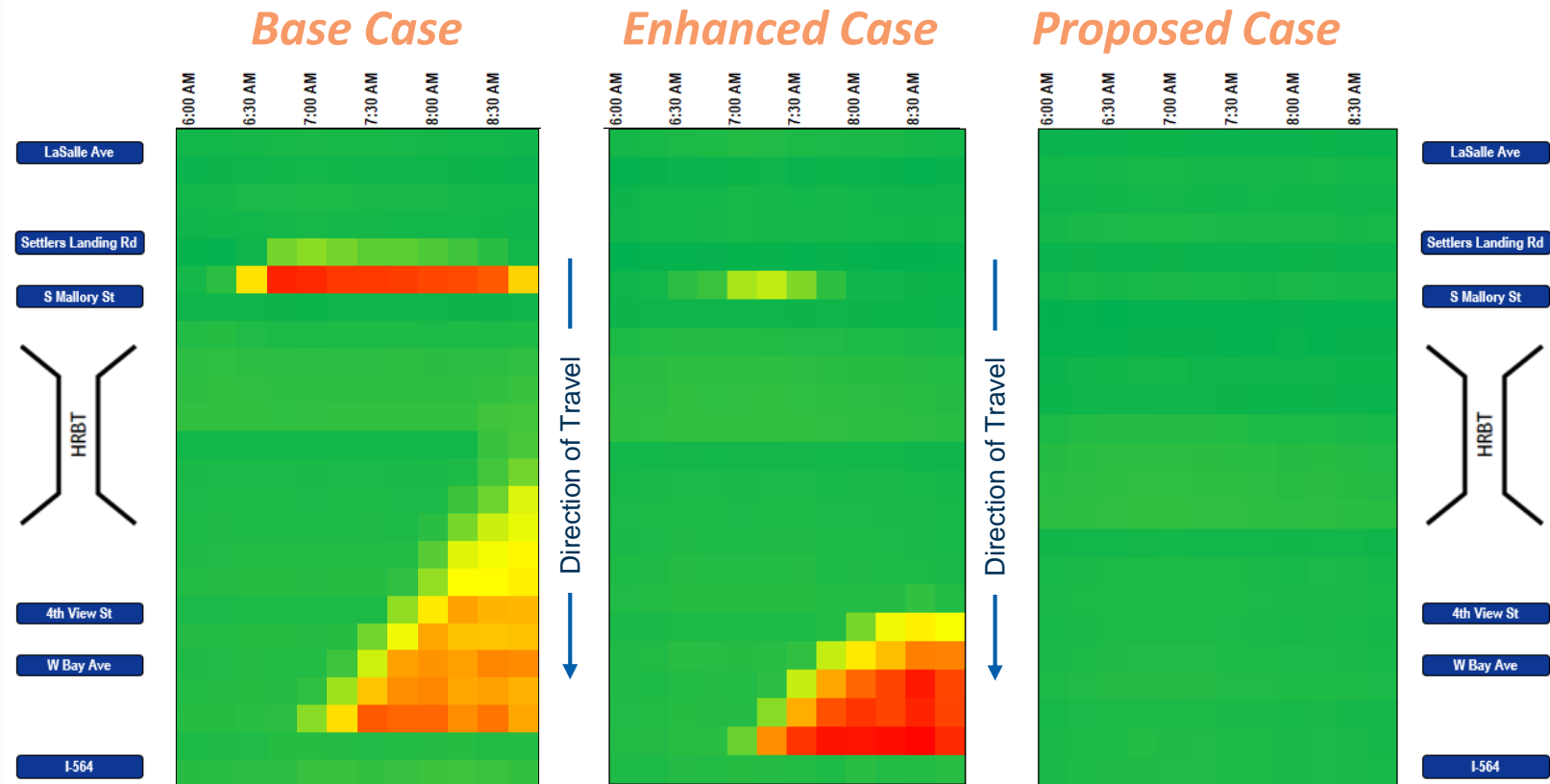
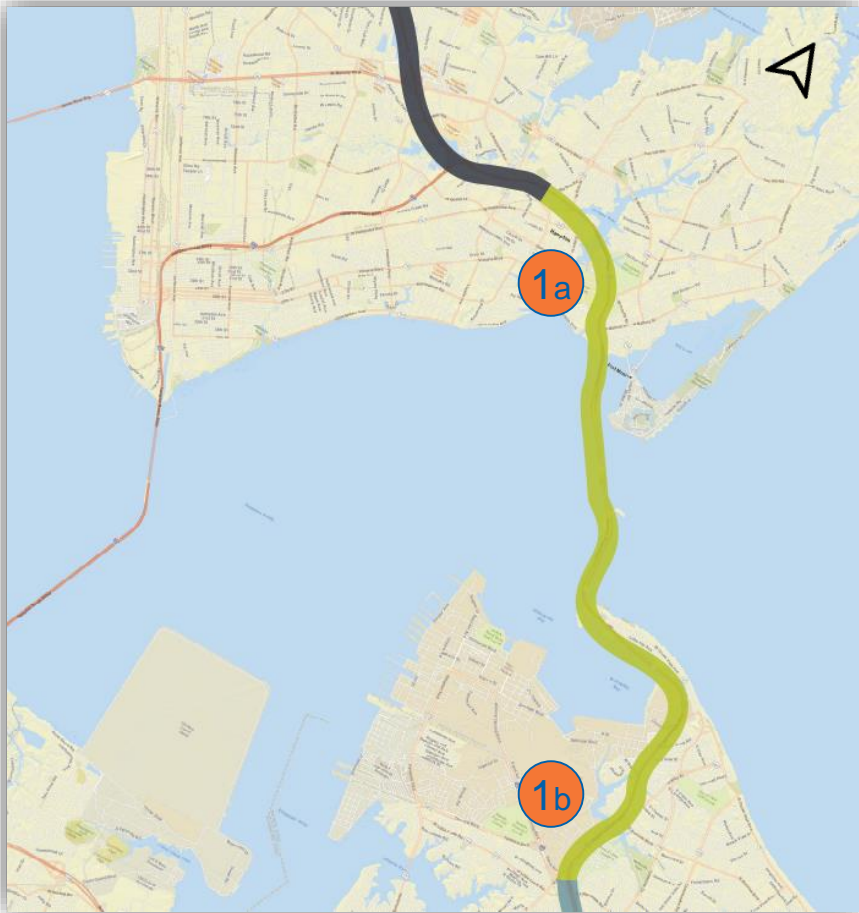


1 Speed Comparison at HRBT (2025 AM I-64 EB)

1a *Between Settlers Landing Rd and Mallory St*

1b *Between W Bay Ave and I-564*

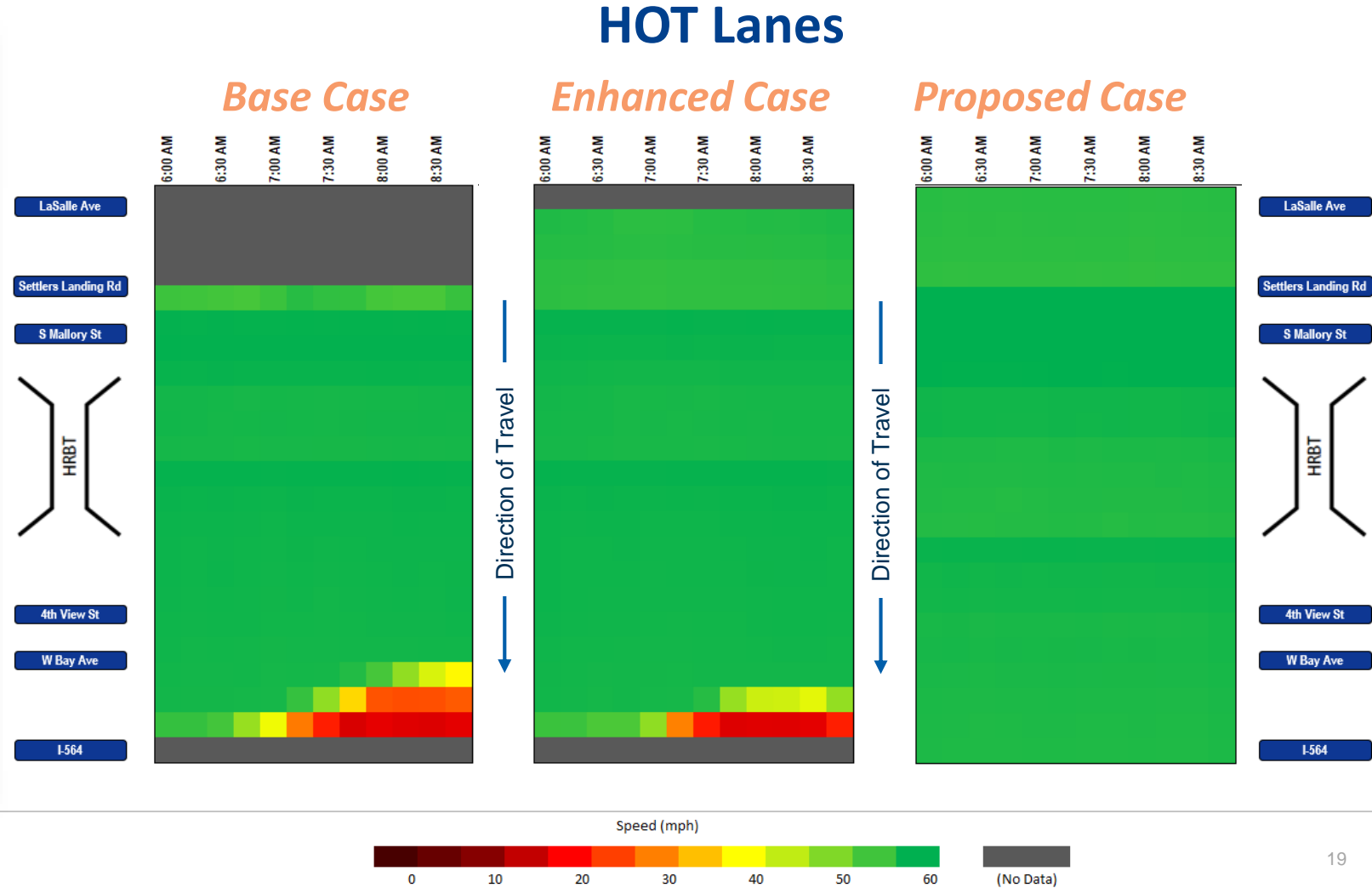
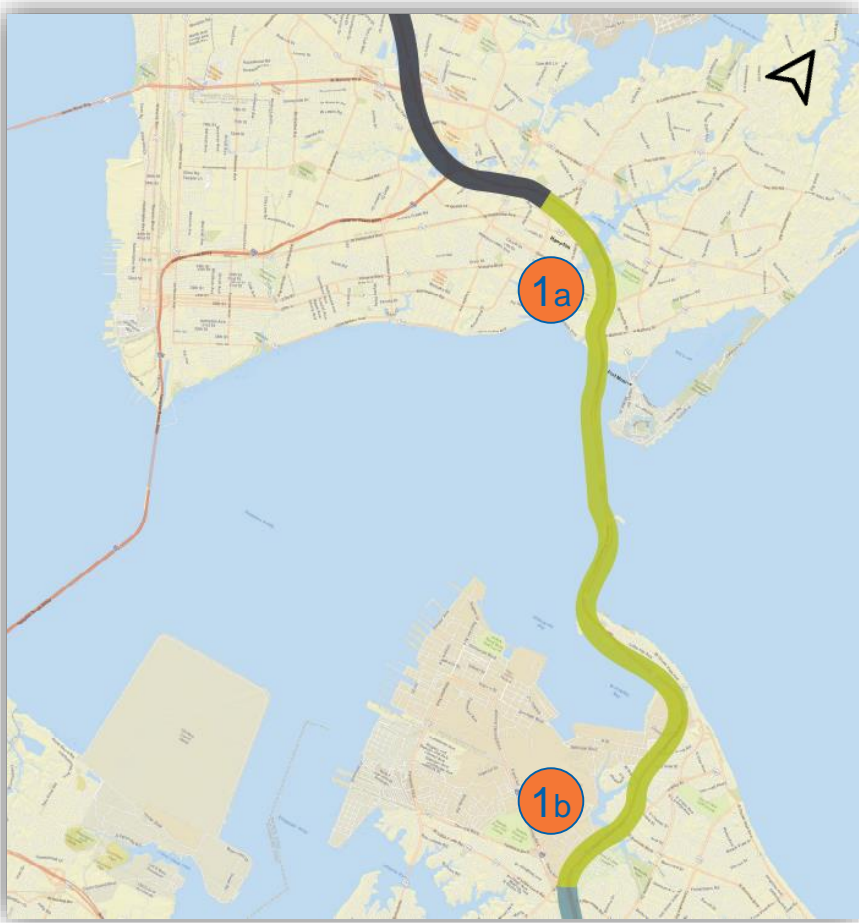
General Purpose Lanes



1 Speed Comparison at HRBT (2025 AM I-64 EB)

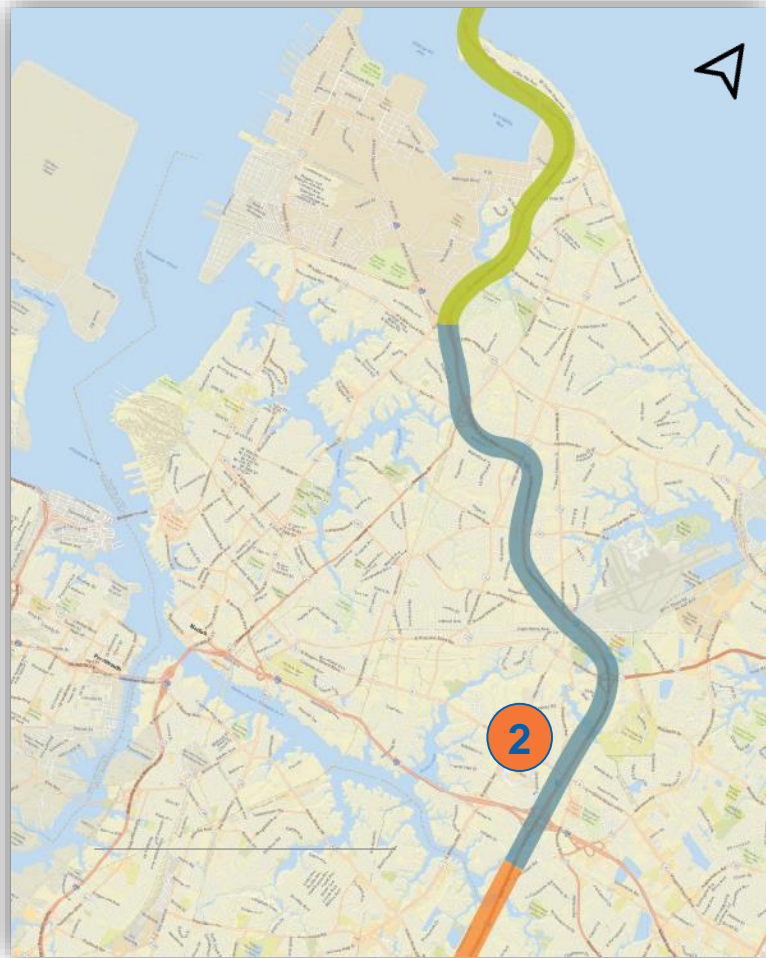
1a *Between Settlers Landing Rd and Mallory St*

1b *Between W Bay Ave and I-564*

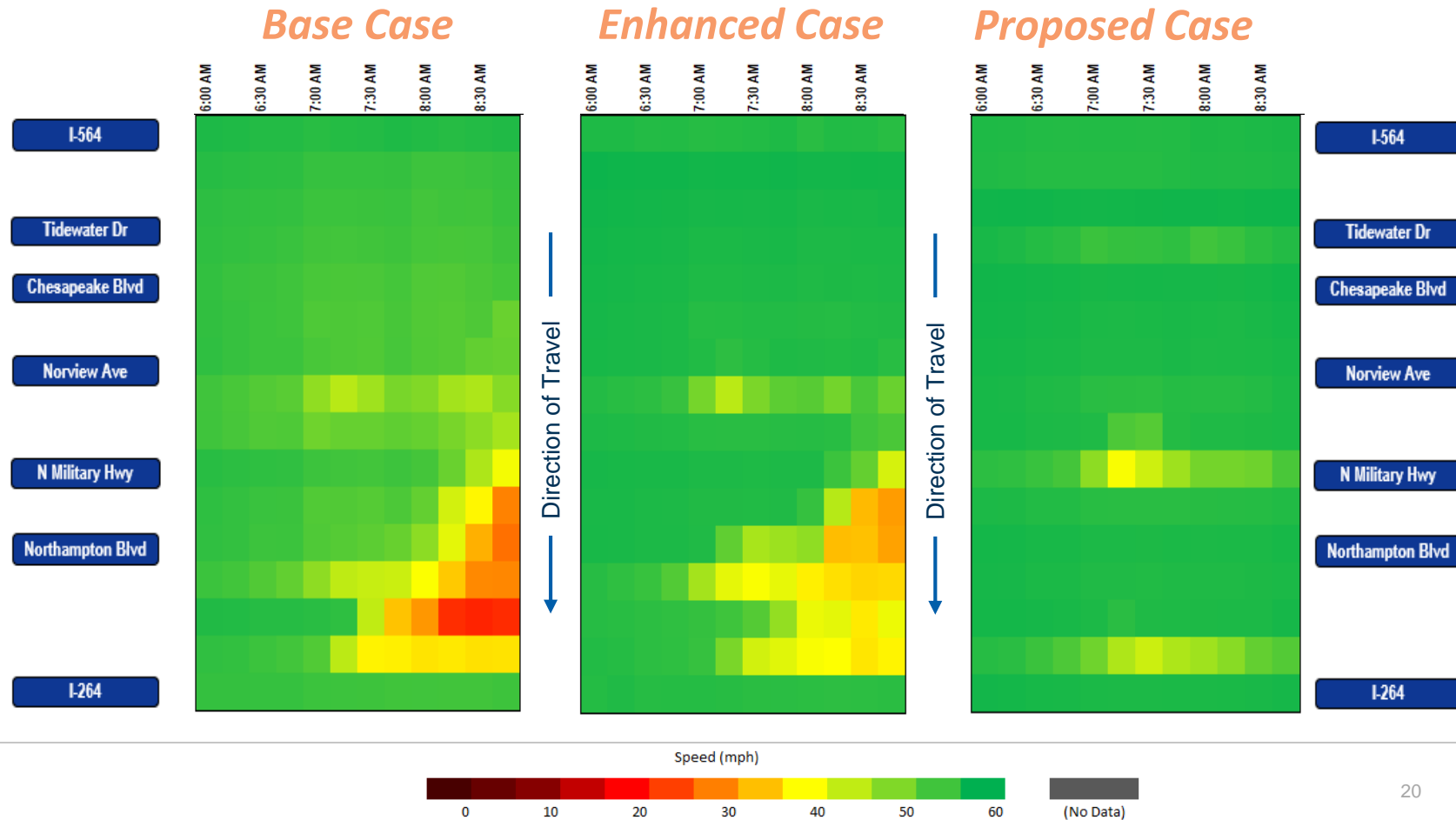


② Speed Comparison from I-564 to I-264 (2025 AM I-64 EB)

② At merge from Northhampton Blvd Ramps

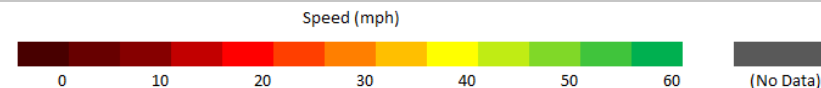
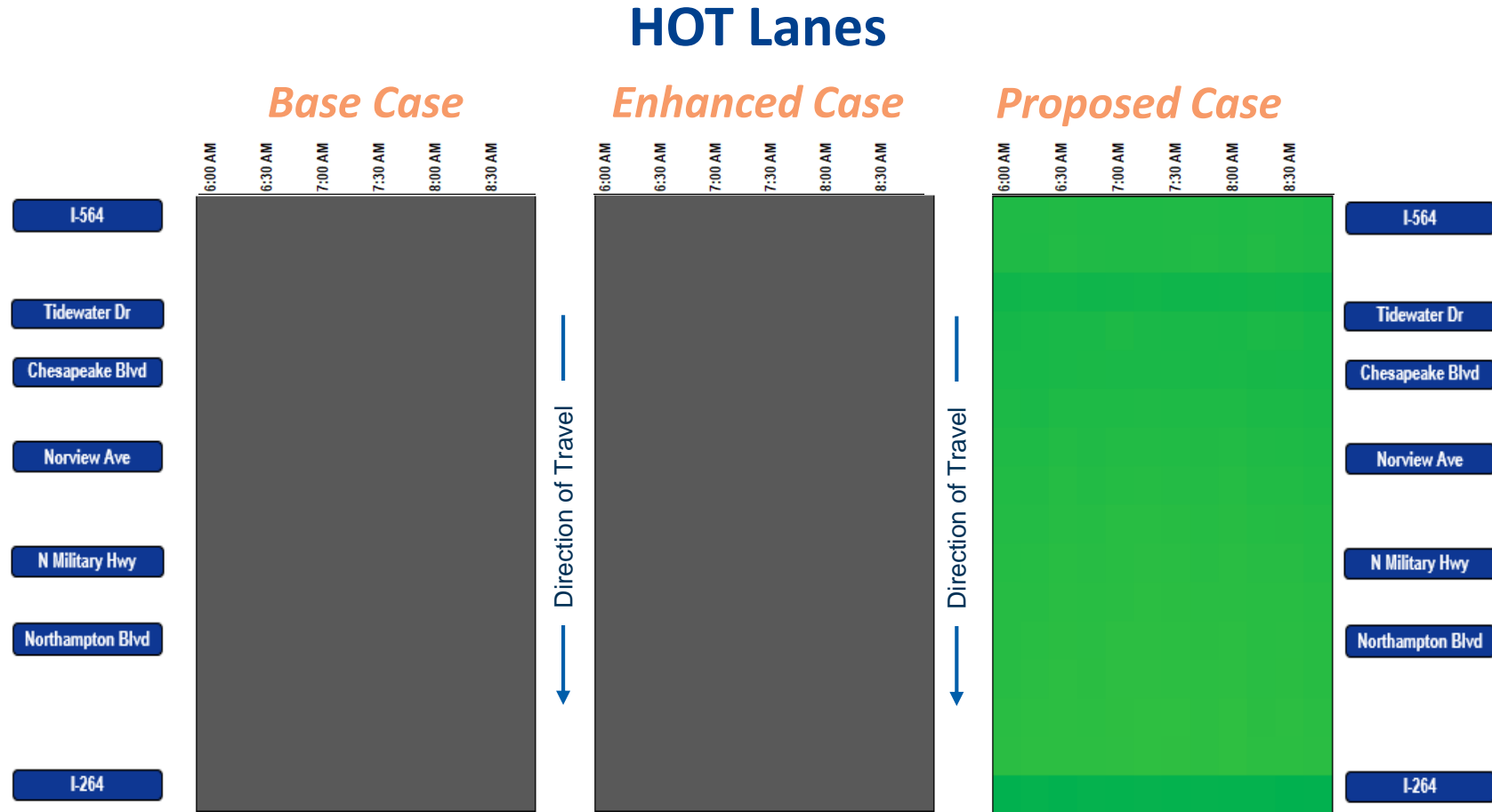
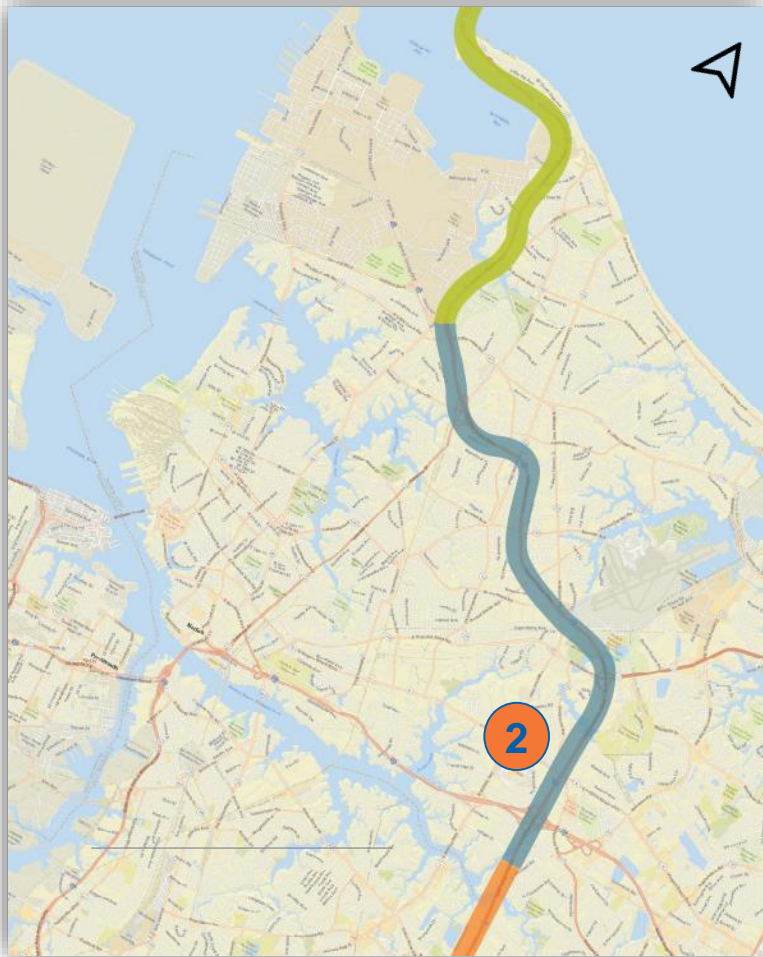


General Purpose Lanes



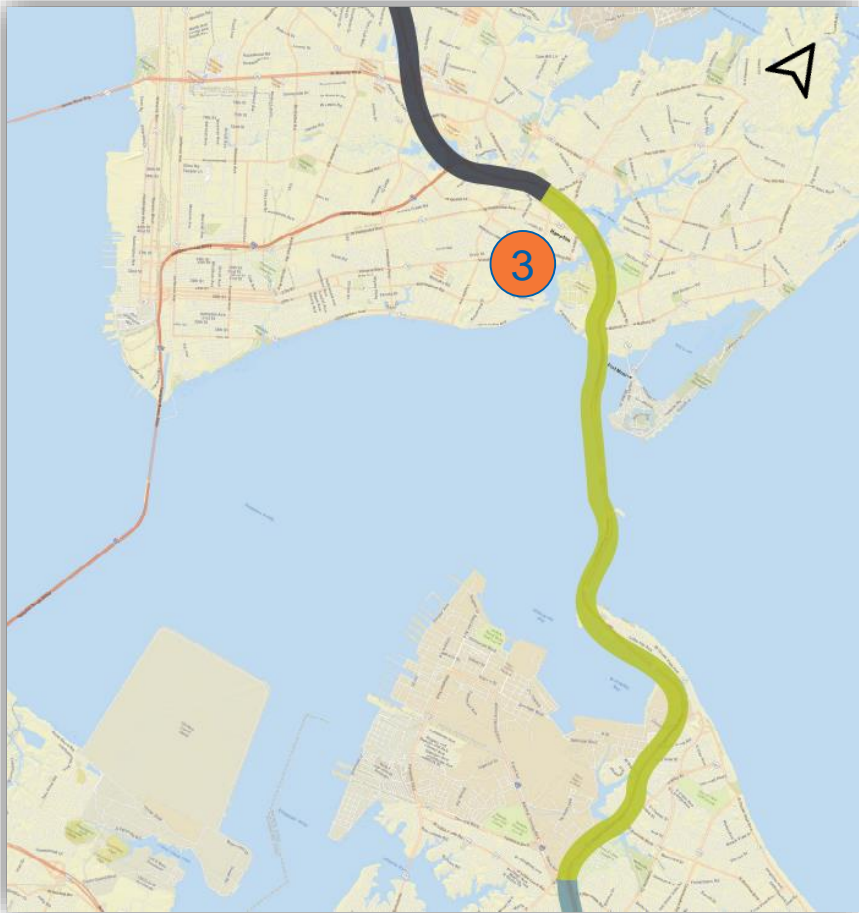
② Speed Comparison from I-564 to I-264 (2025 AM I-64 EB)

② At merge from Northhampton Blvd Ramps

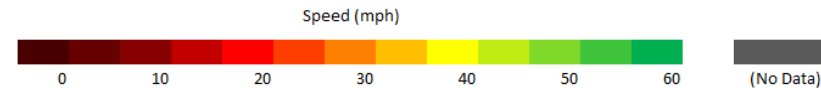
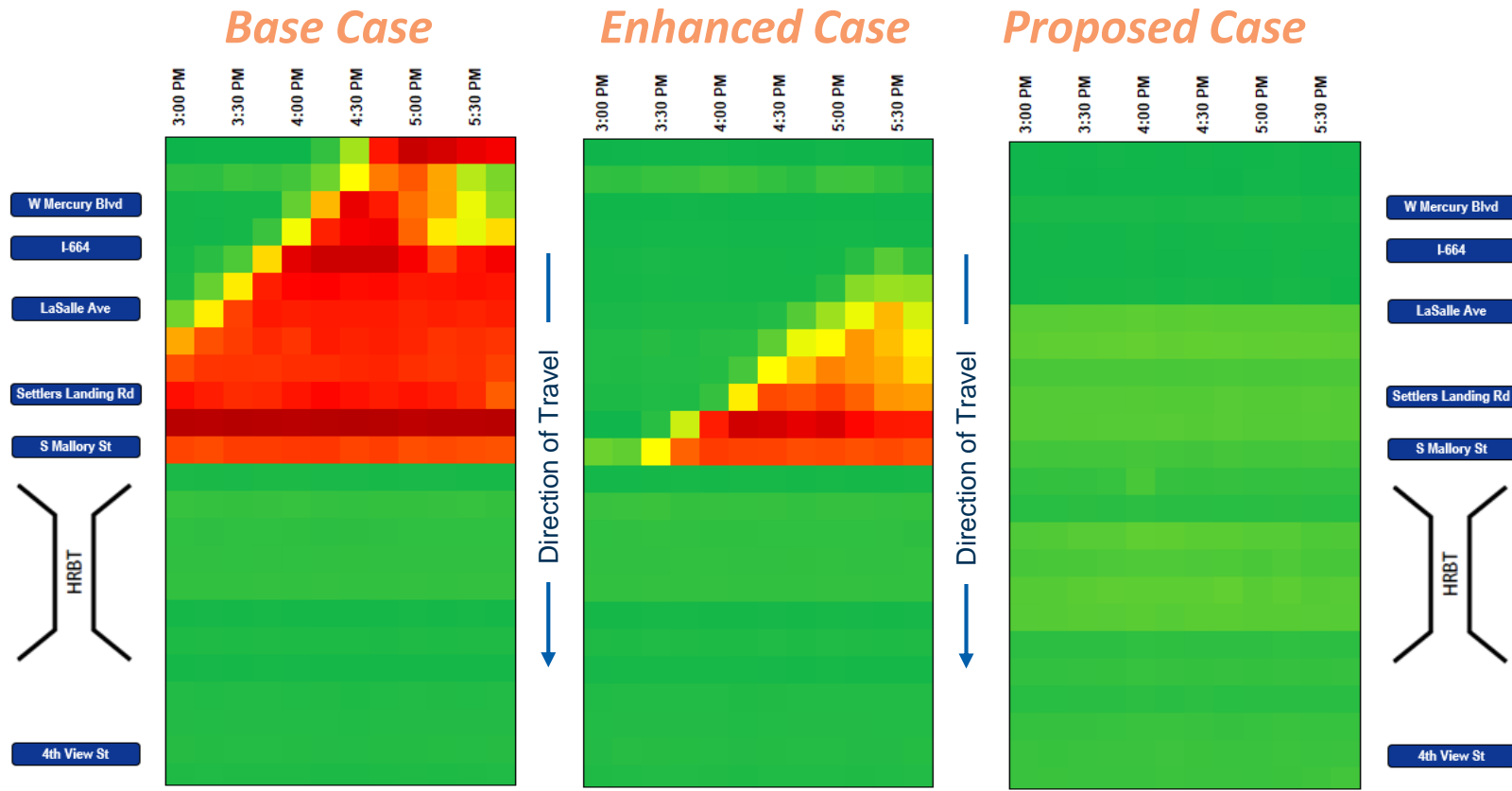


3 Speed Comparison at HRBT (2025 PM I-64 EB)

3 Between Mercury Blvd and Mallory St

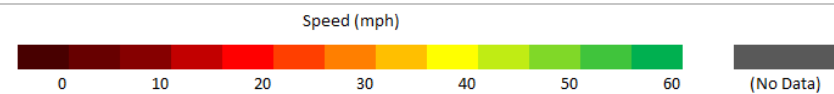
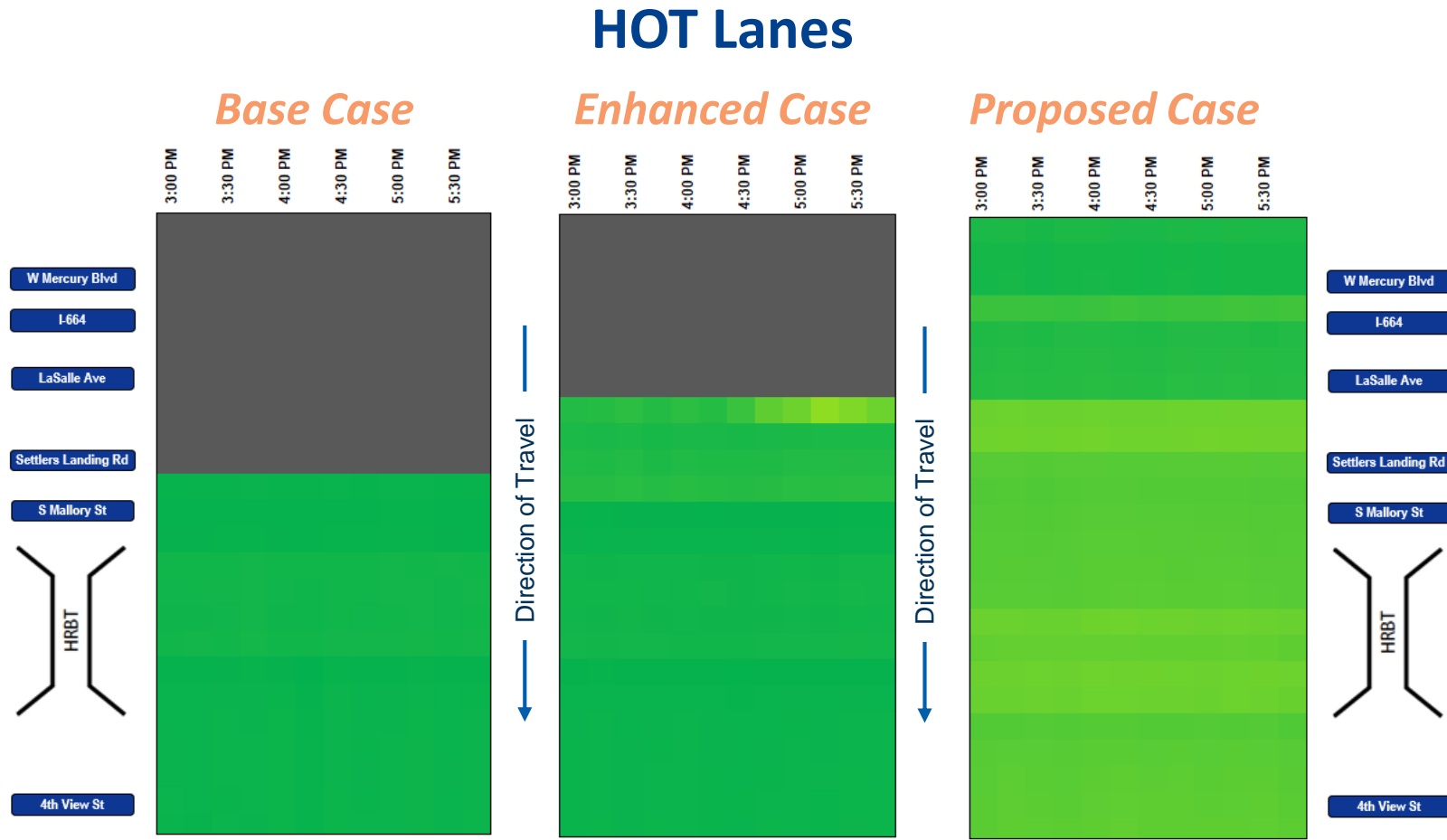
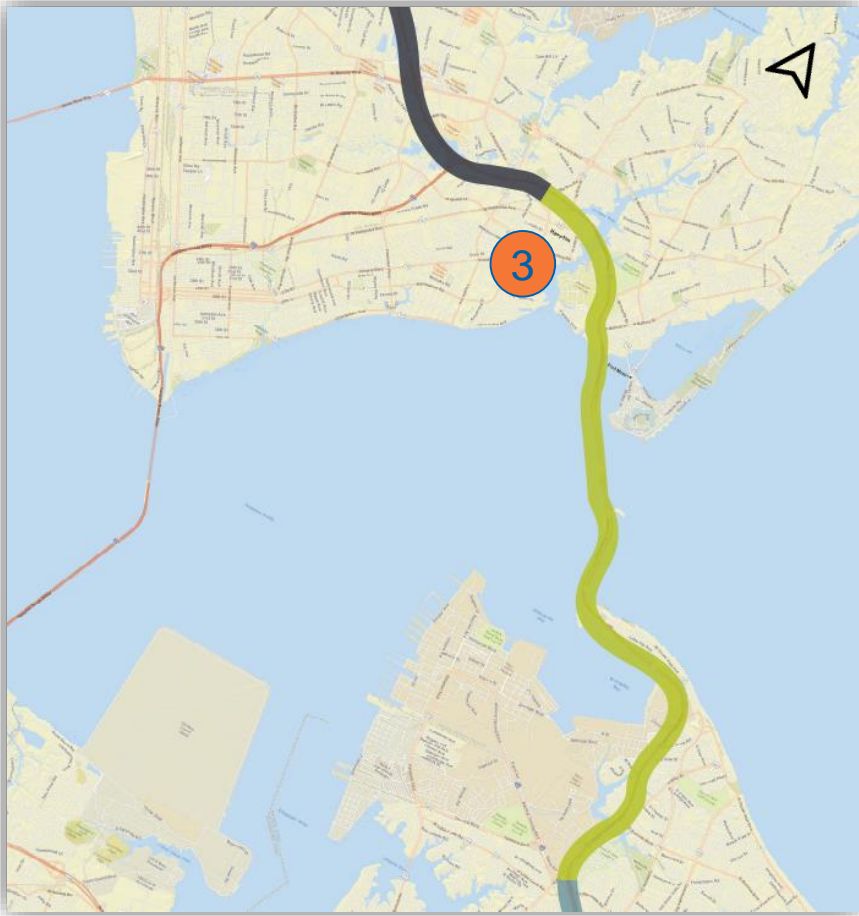


General Purpose Lanes



3 Speed Comparison at HRBT (2025 PM I-64 EB)

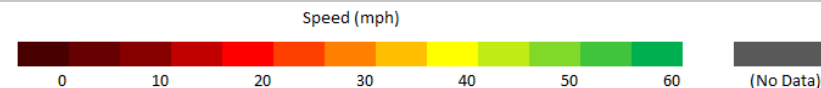
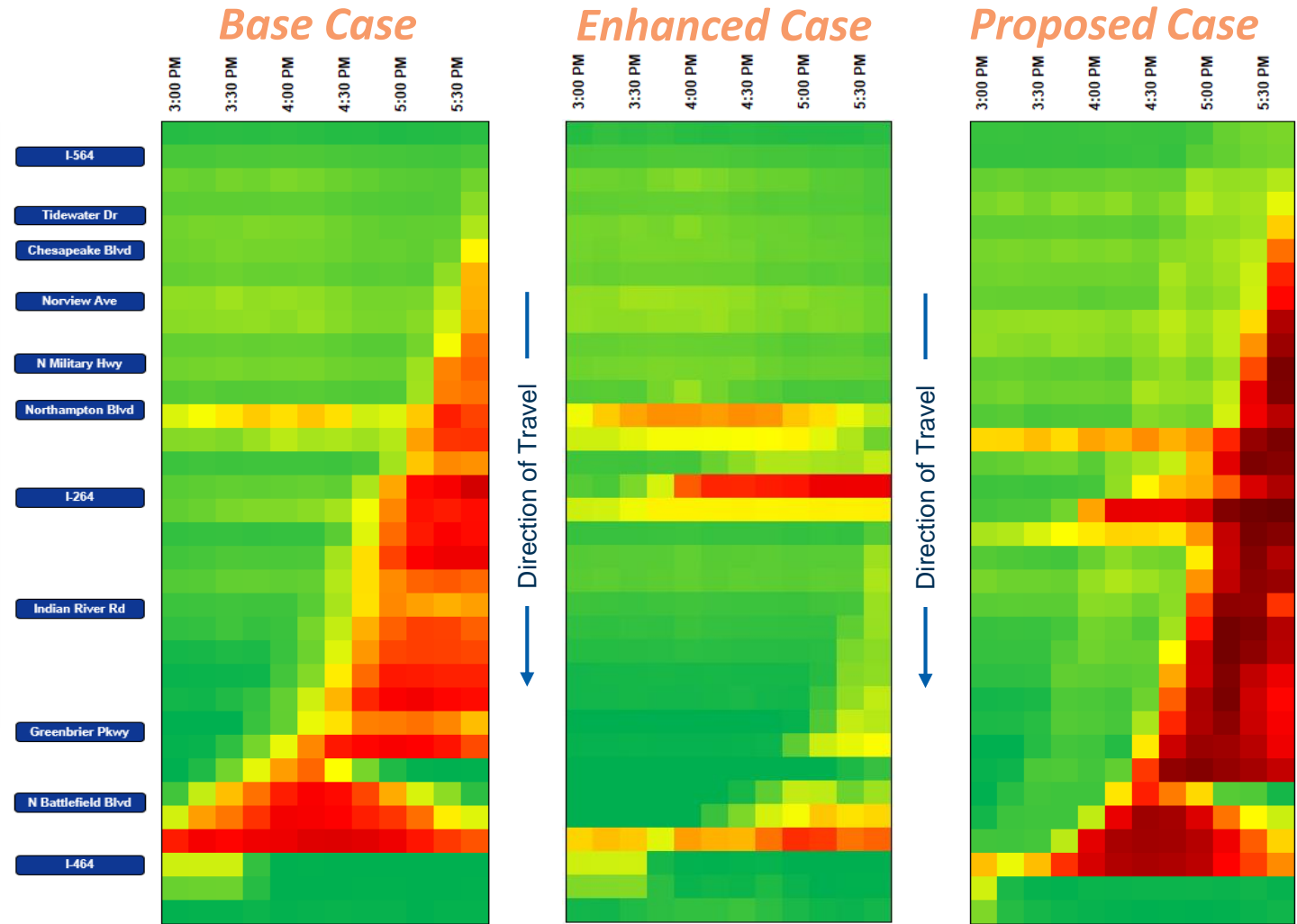
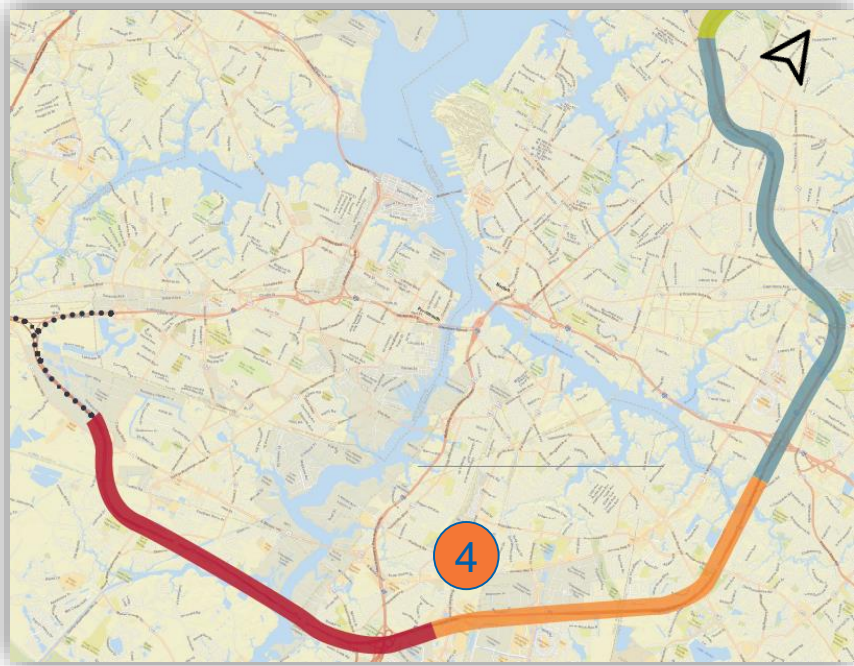
3 Between Mercury Blvd and Mallory St



4 Speed Comparison from I-564 to I-464 (2025 PM I-64 EB)

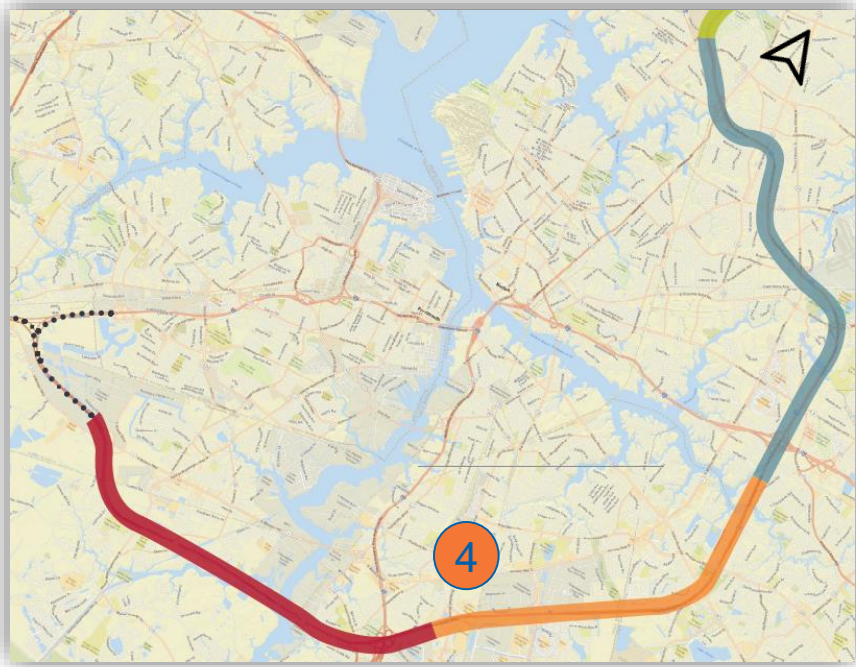
4 At I-464 past I-264

General Purpose Lanes

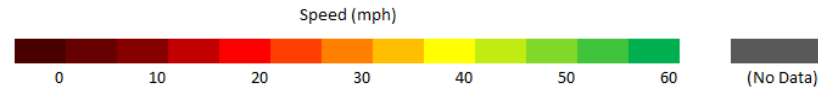
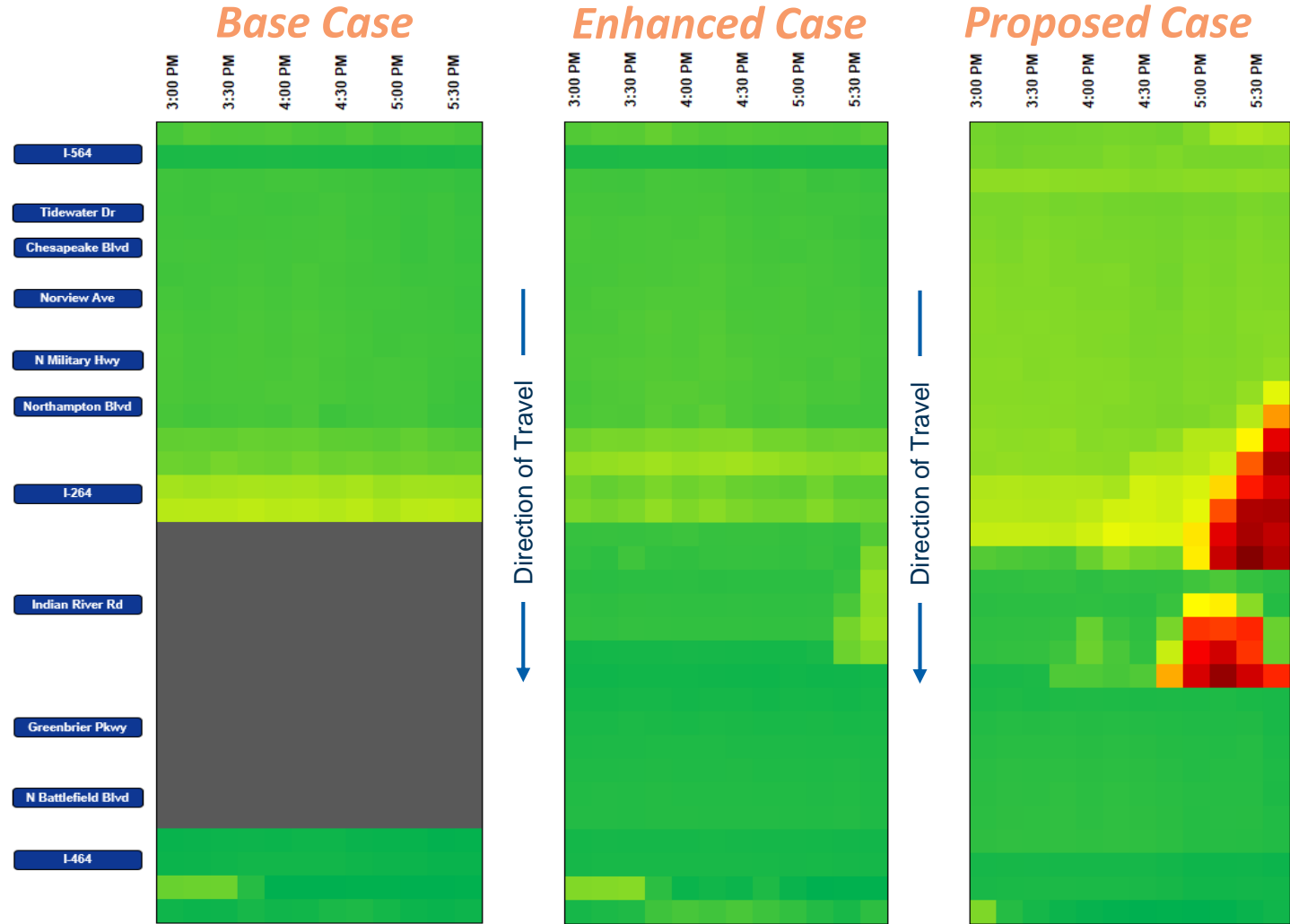


4 Speed Comparison from I-564 to I-464 (2025 PM I-64 EB)

4 At I-464 past I-264



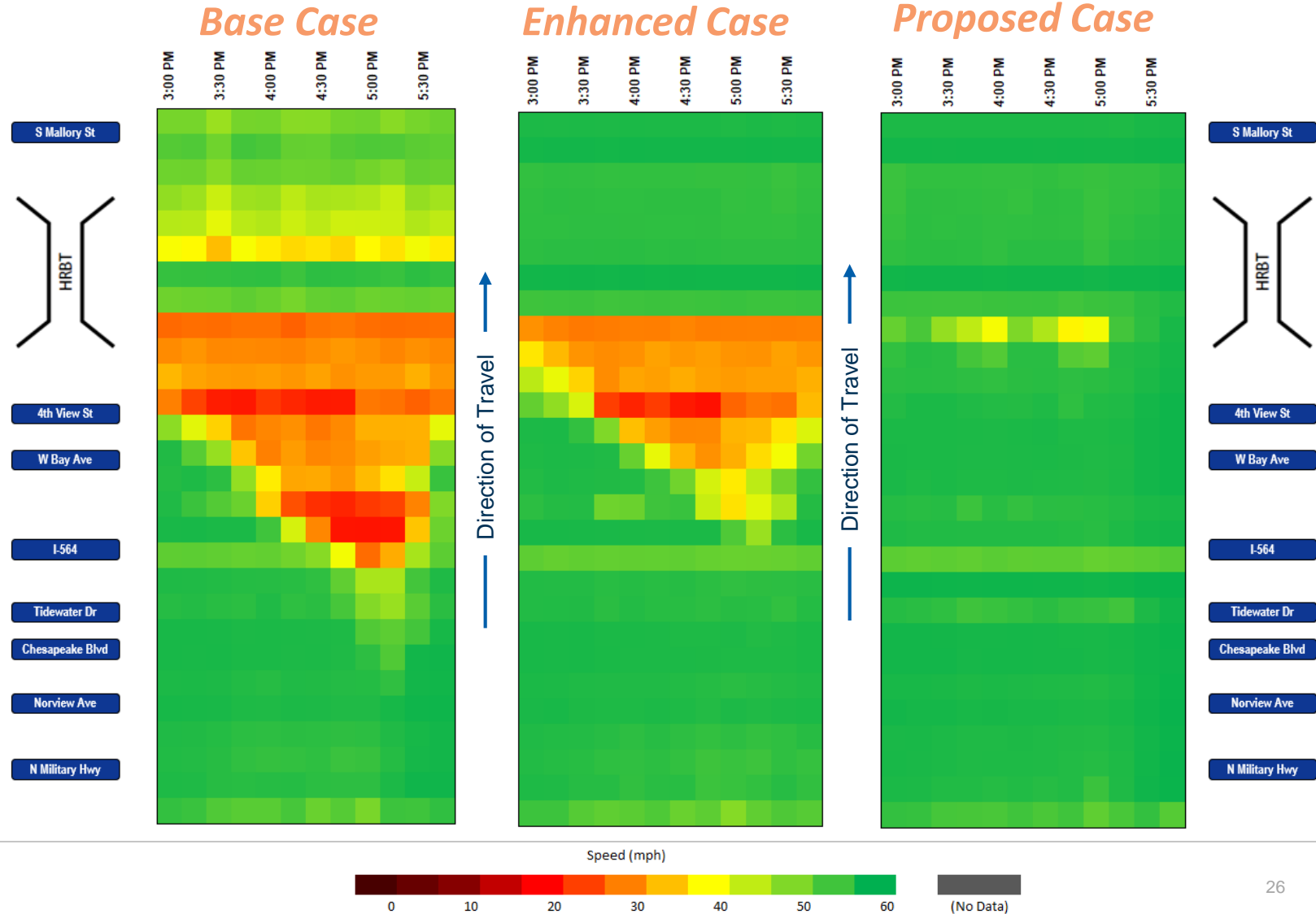
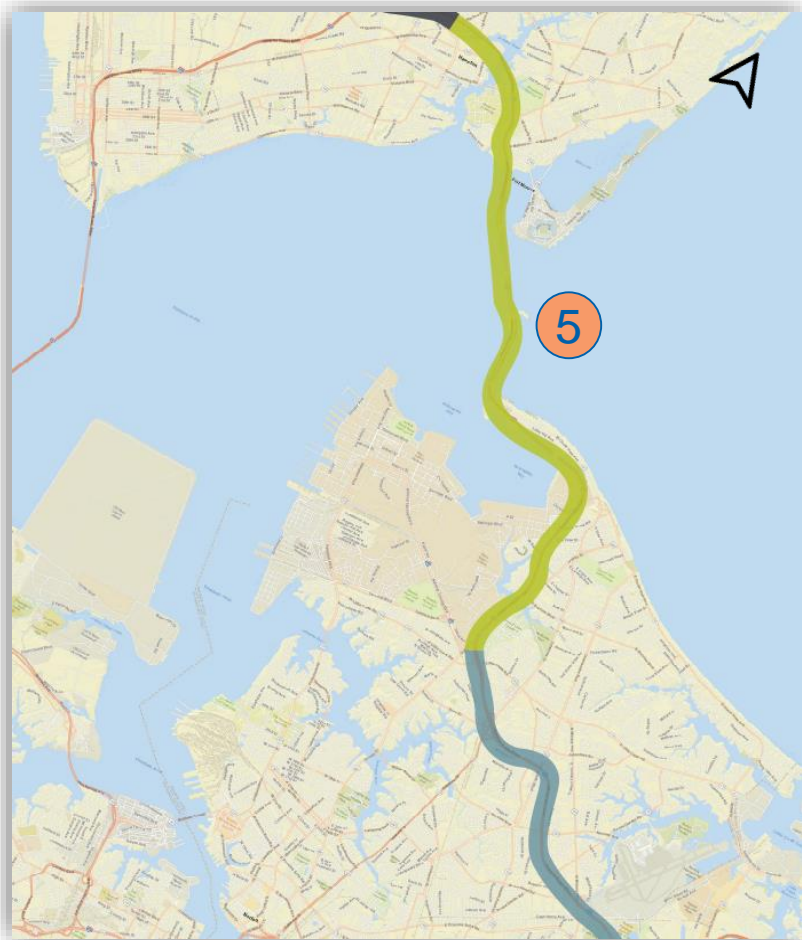
HOT Lanes



5 Speed Comparison at HRBT (2025 PM I-64 WB)

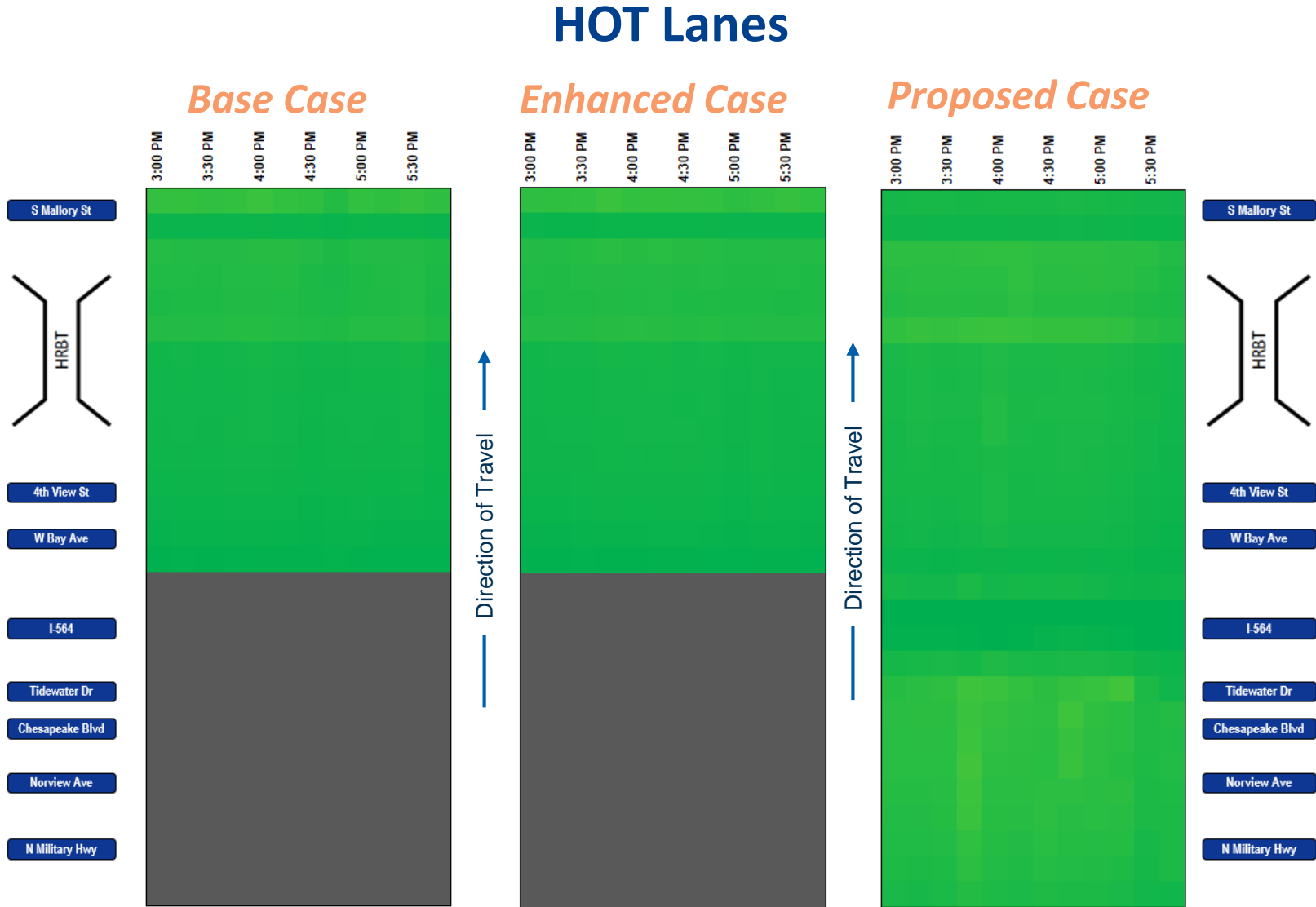
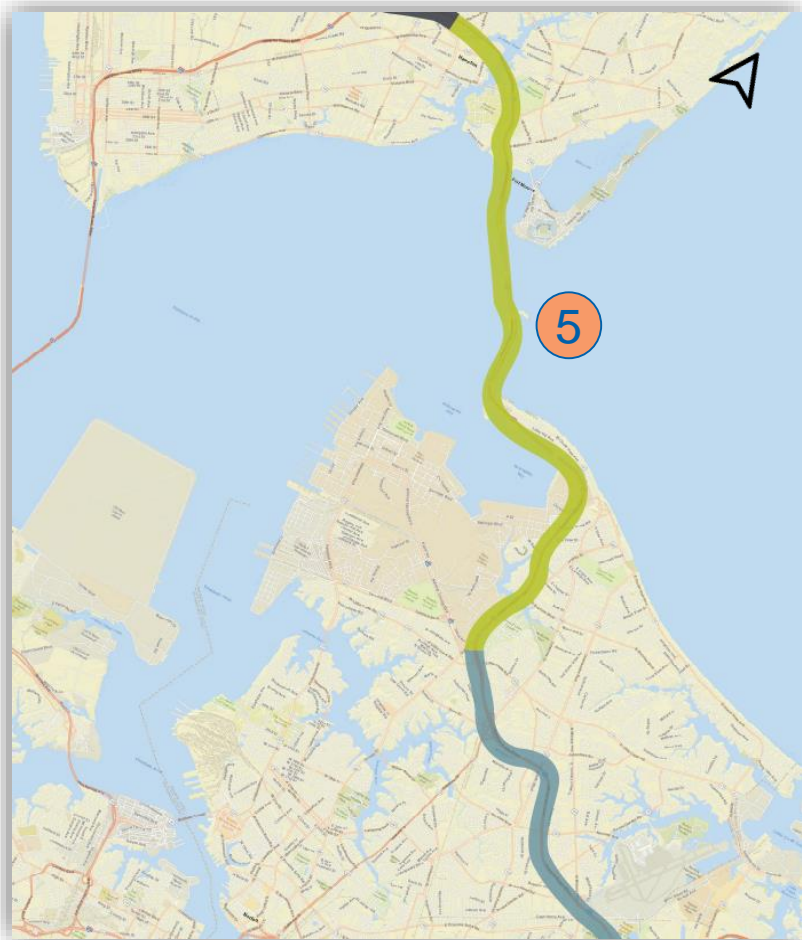
5 At HRBT Tunnel Entrance

General Purpose Lanes



5 Speed Comparison at HRBT (2025 PM I-64 WB)

5 At HRBT Tunnel Entrance



Next Steps

Tolling Policy

- **HOT2 vs HOT3**
- **Hours of Operation**

Financing of Proposed Scenario

- **Traffic & Revenue**
- **Costs of additional proposed improvements**



COMMONWEALTH of VIRGINIA
Office of the
SECRETARY of TRANSPORTATION

Interstate 95 Corridor Improvement Plan

Nick Donohue
Deputy Secretary of Transportation
October 2019



I-95 Corridor Improvement Plan

District Public Input Meetings

WEDNESDAY, OCTOBER 9,

FREDERICKSBURG DISTRICT

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

THURSDAY, OCTOBER 17,

NORTHERN VIRGINIA DISTRICT

Freedom High School
15201 Neabsco Mills Road
Woodbridge, VA 22191
6–8 p.m.

TUESDAY, OCTOBER 15, 2019

RICHMOND AND HAMPTON ROADS DISTRICTS

Richmond Marriott Short Pump
4240 Dominion Boulevard
Glen Allen, VA 23060
5–7 p.m.

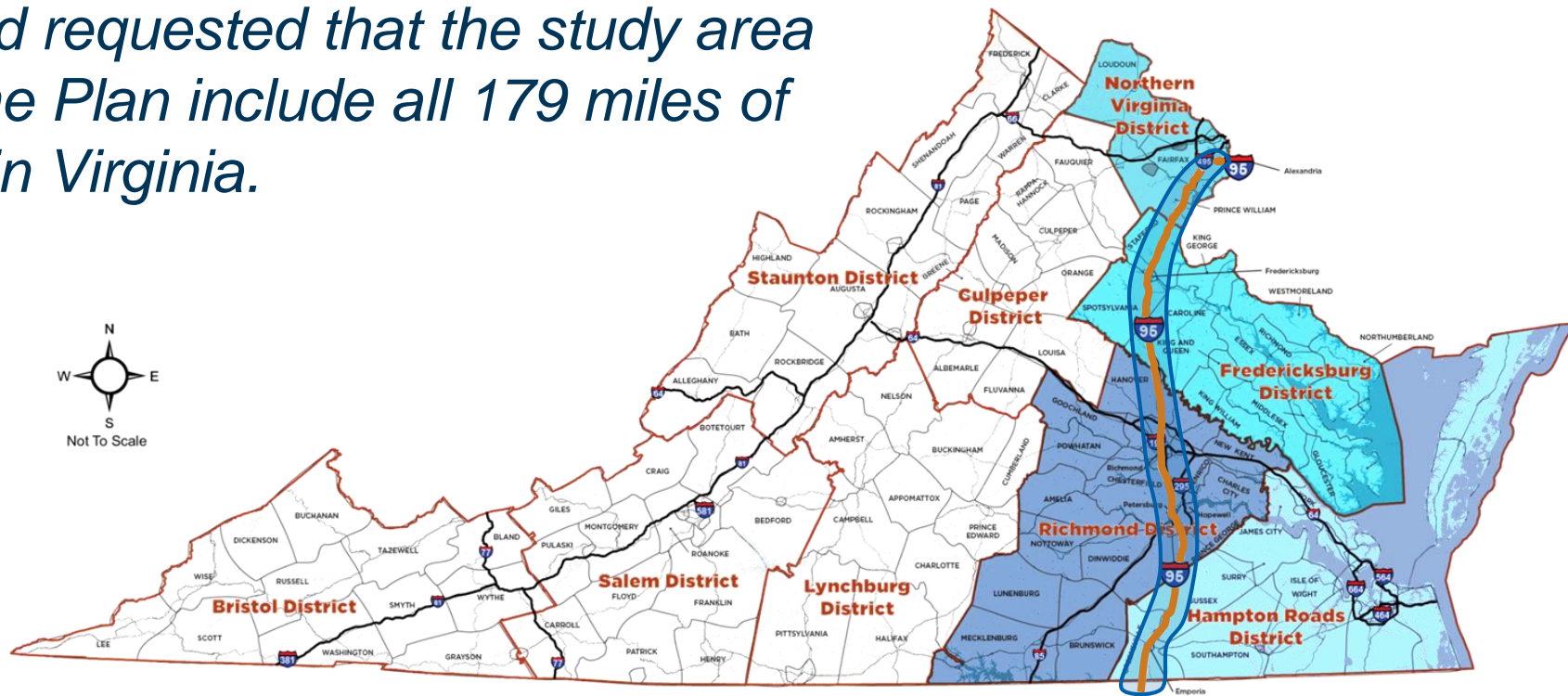
I-95 Corridor Improvement Plan

- **General Assembly passed two resolutions (HJR 581 and SJR 276) requesting a study of I-95**
- **The I-95 Corridor Improvement Plan will:**
 - Identify key problem areas along the corridor
 - Identify potential solutions and areas for additional review and study
- **Public meetings will conclude by November 30**
- **Findings and recommendations reported to the General Assembly in 2020**

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



9.0 Million

Trucks Per Year



Critical North-South Corridor



\$195 Billion

in Goods Moved Per Year



~ 21,000

Crashes Over 4 Years



> 3,700 Incidents Per Year

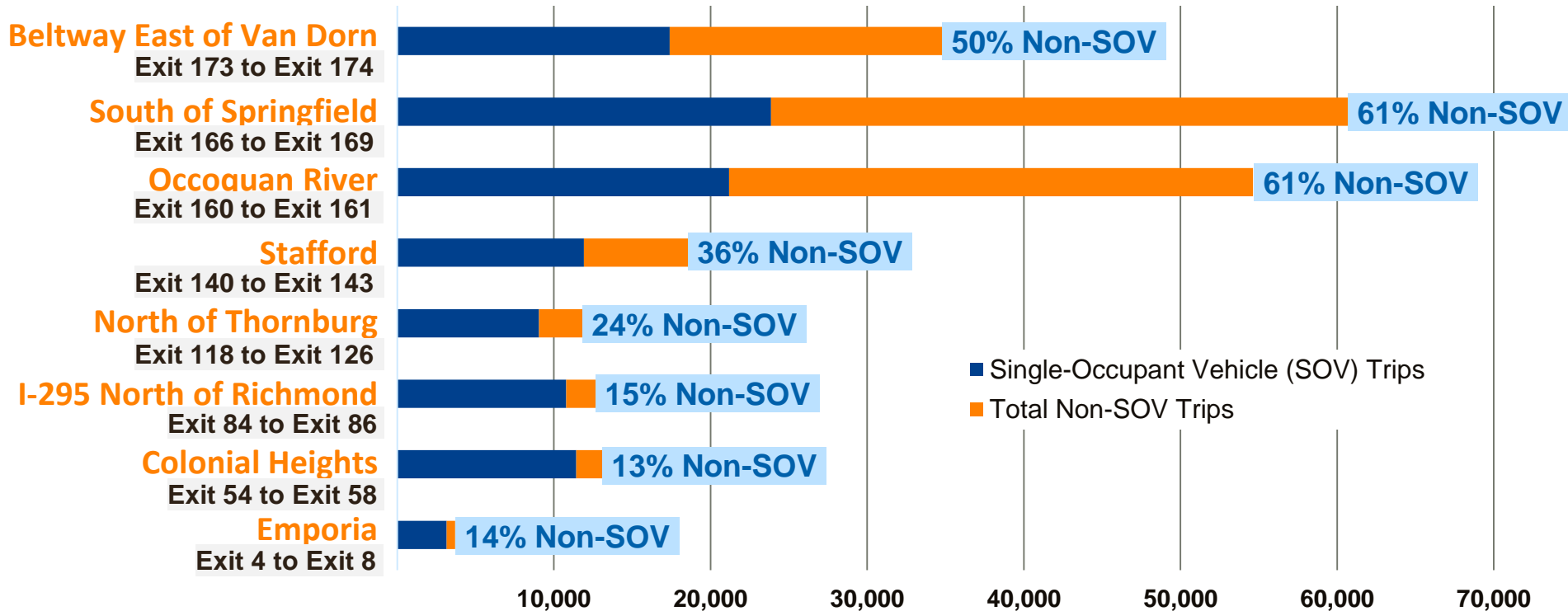
(With Average Clearance Times Almost 2 Hours)



Multimodal Corridor

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

Persons Moved on Northbound I-95 in the Morning

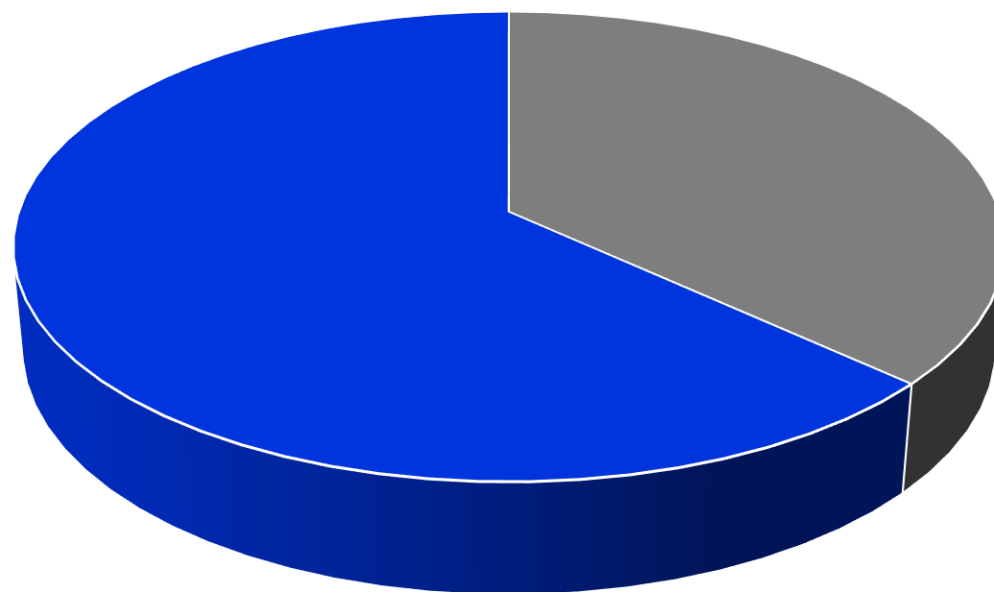


Total
Persons
Moved



Person Throughput in Express Lanes

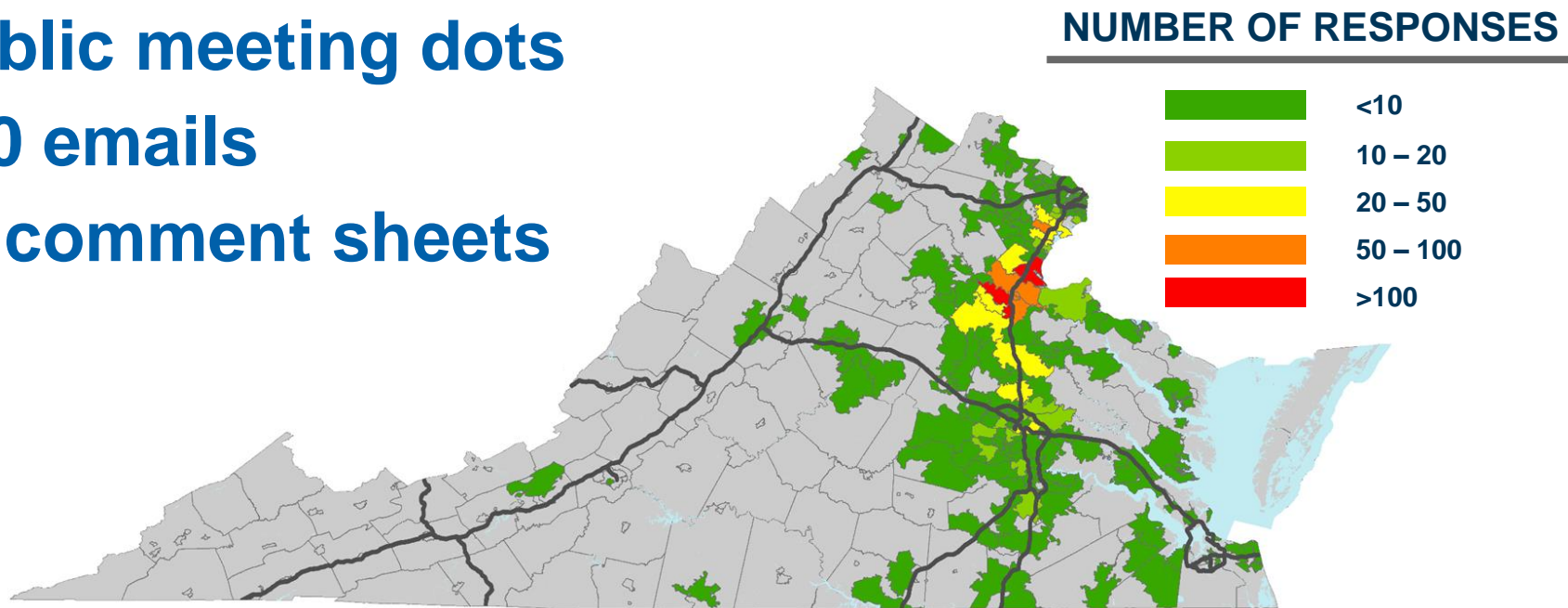
**Express Lanes
move more than
twice as many
people per lane as
general purpose
lanes northbound
during the morning
rush hours**



■ General Purpose ■ Express Lanes

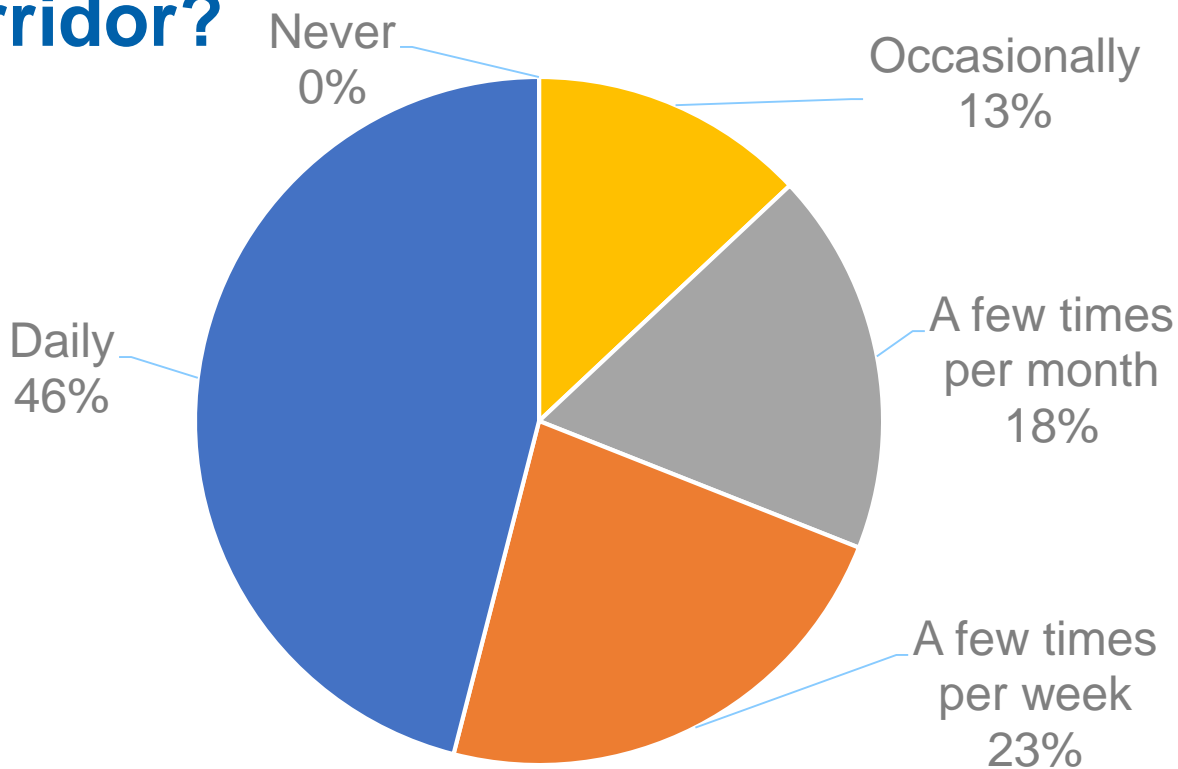
July Meetings Public Feedback and Survey Results

- **Online survey results (MetroQuest)**
 - 3,000+ responses
 - 11,700 map markers
- **Public meeting dots**
- **200 emails**
- **40 comment sheets**



July Meetings Public Feedback and Survey Results

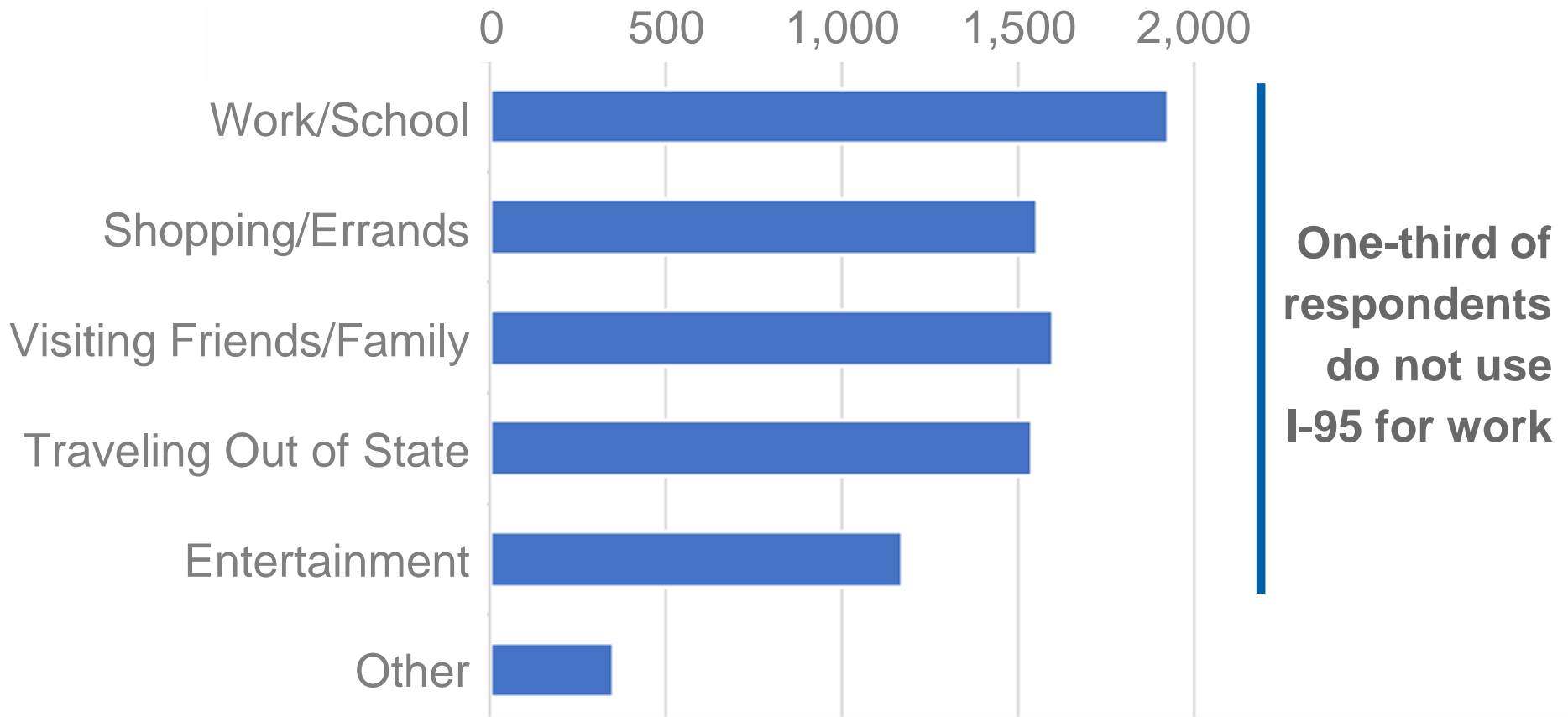
How often do you typically travel in the I-95 corridor?



Majority of respondents travel on I-95 several times per week

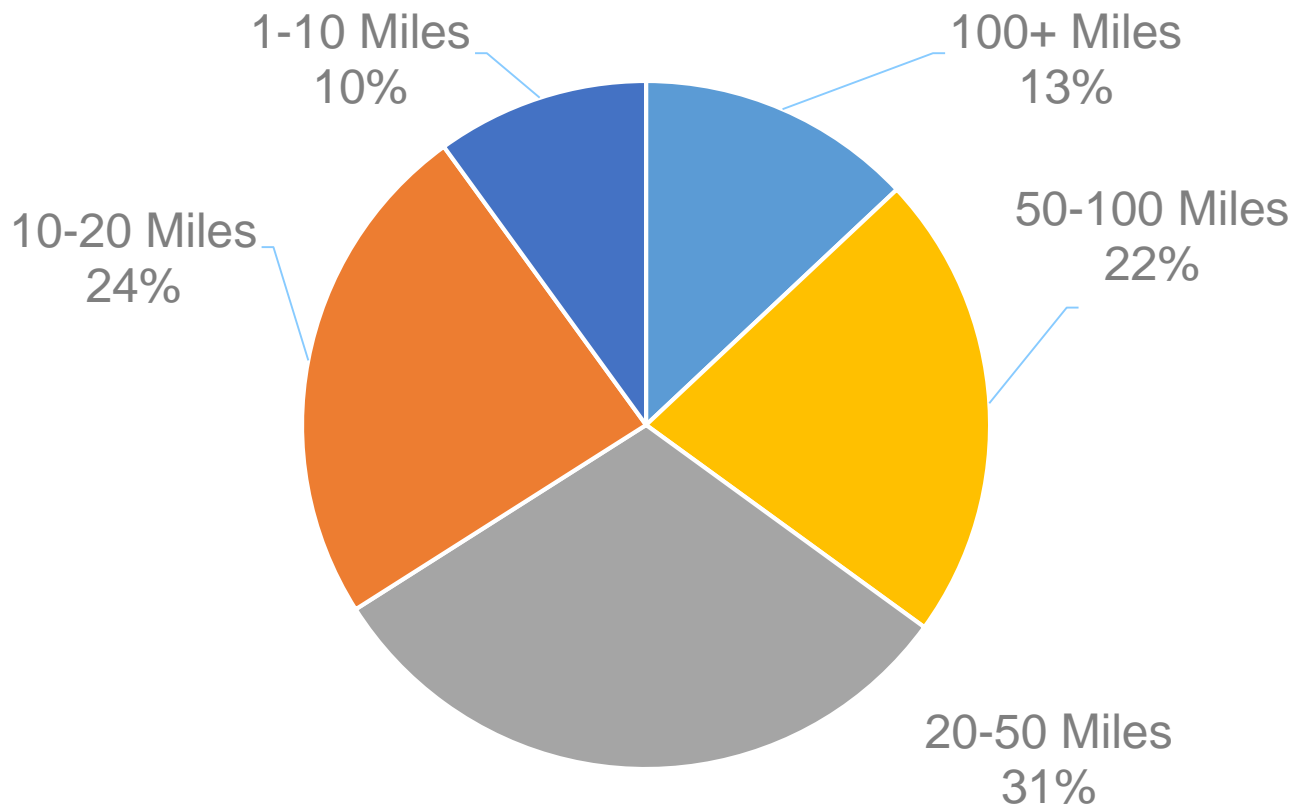
July Meetings Public Feedback and Survey Results

Where do your trips on I-95 take you?



July Meetings Public Feedback and Survey Results

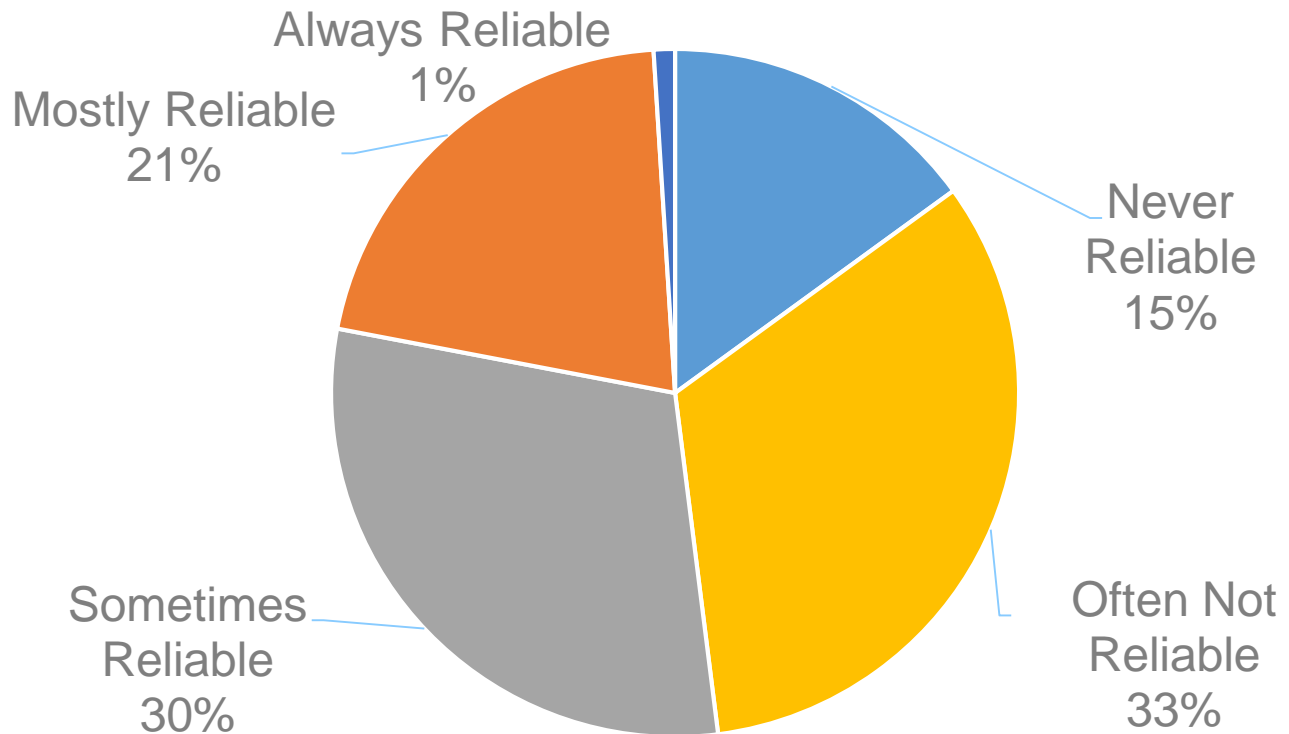
How far do you typically travel on I-95?



Nearly a quarter of respondents take trips between 50 and 100 miles

July Meetings Public Feedback and Survey Results

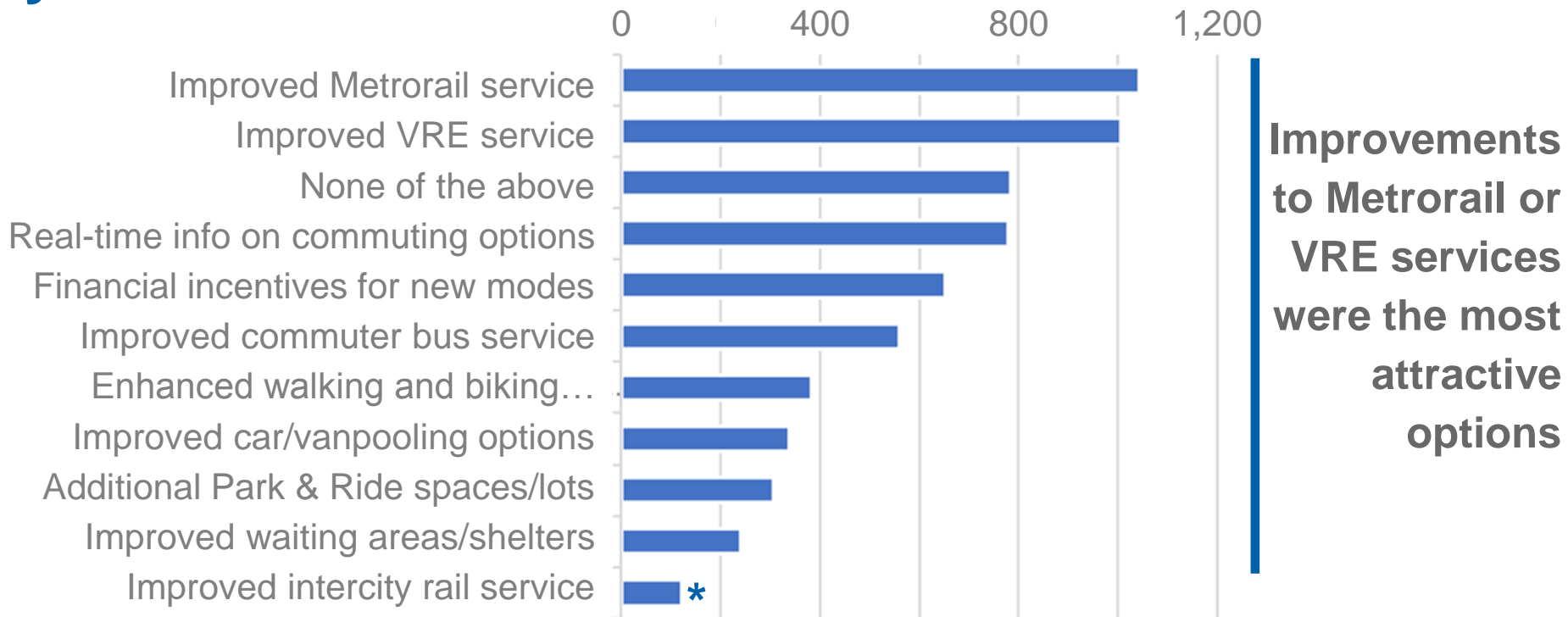
How reliable is your typical trip on I-95?



78% of respondents rate trip as sometimes reliable or worse

July Meetings Public Feedback and Survey Results

What potential improvements would enhance your use of other modes?

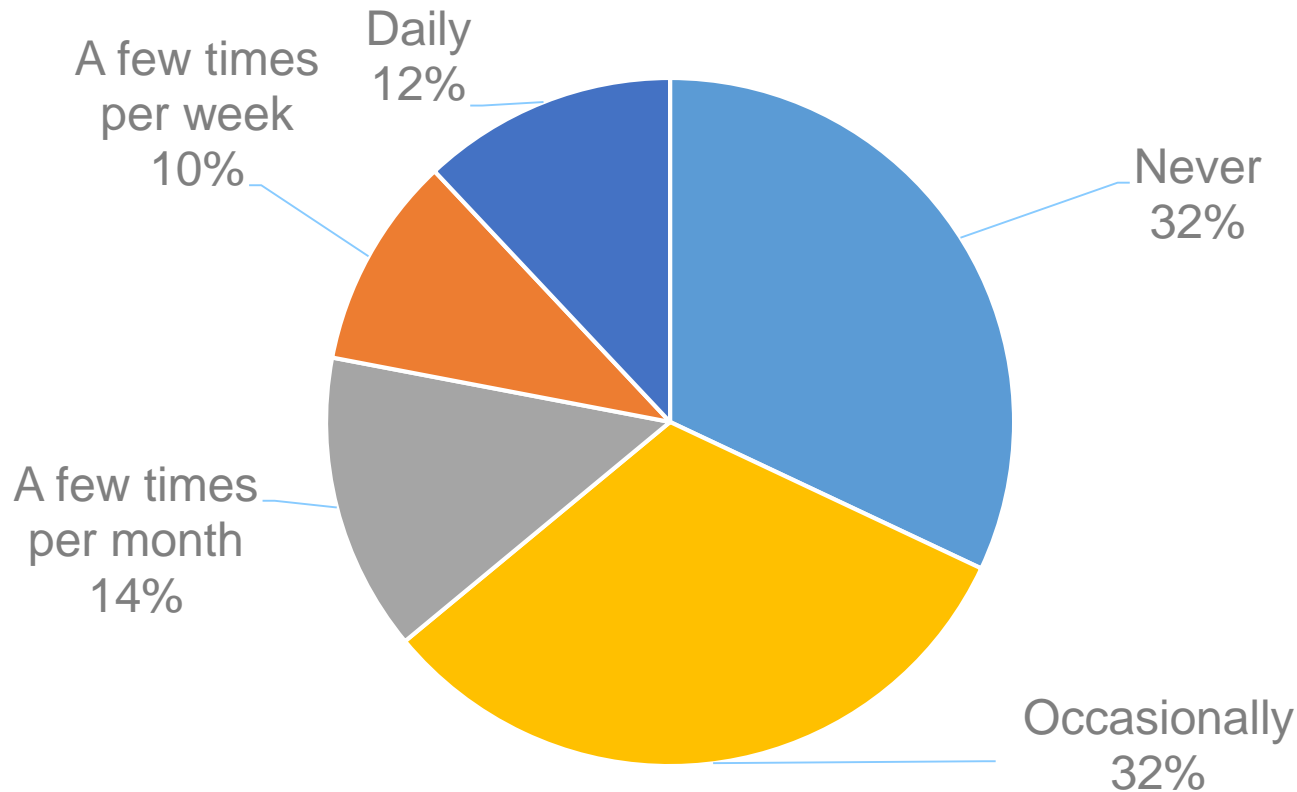


Improvements to Metrorail or VRE services were the most attractive options

* Improved intercity rail service option added in the middle of the survey: about 25% selected this option

July Meetings Public Feedback and Survey Results

How often do you use the I-95 Express Lanes?



78% of respondents have either an E-ZPass or E-Zpass Flex

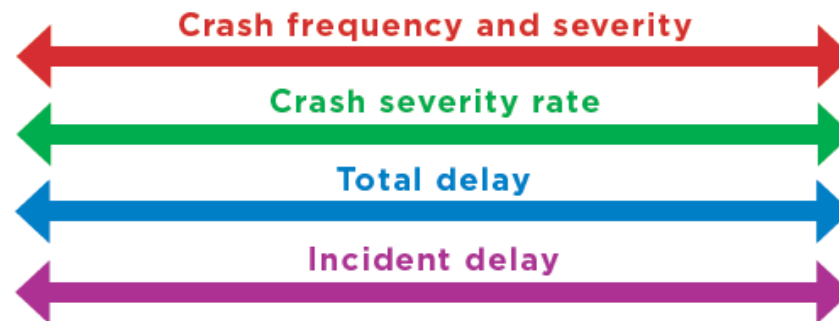
July Public Meetings

Problem Identification

Reviewed 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



Suite of Improvements

Focus Areas

OPERATIONS ON I-95

PARALLEL FACILITIES (Routes 1 and 301)

CAPITAL PROJECTS ON I-95

MULTIMODAL (rail, bus, carpool, park and ride)





Data-driven approach incorporating performance measures





GOALS

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

Current Investment & Anticipated Benefits

Three major capacity improvement projects in Fredericksburg District open by 2023: investment of over \$800M for these three projects

Legend
 Increase 25-50% (time period)
 Increase >50% (time period)

Board #	Project Description	Projected Change in Travel Speed	
		Northbound	Southbound
11	Rappahannock River Crossing Northbound	 AM	N/A
11	Rappahannock River Crossing Southbound	N/A	 PM
11-12	I-95 Express Lanes– Fredericksburg Extension (Fredex)	 AM	 PM

Sample Operational Improvements

CCTV Cameras

Detect incidents and provide situational awareness of incidents

Changeable Message Signs

Informs drivers of conditions ahead

Safety Service Patrol

Provide incident scene support and help stranded motorists

Quick Clearance Towing Programs

Contract towing services that are activated as incidents are detected

Variable Speed Limits

Adjustable speed limits that change to reduce traffic congestion



Operational Improvements

Potential Benefits

Quick Clearance Towing Program

Incident clearance times **reduced by up to 2 hours** per incident

Safety Service Patrols

Incident duration **reduced by 25%** when SSP is on-site

Variable Speed Limits

Reduce crashes **by 30%** and increase vehicle throughput by 7%

Unmanned Aerial Systems (UAS)

Crash investigation time **reduced by up to 2 hours**

Queue Warning System

Crashes **reduced by up to 44%**

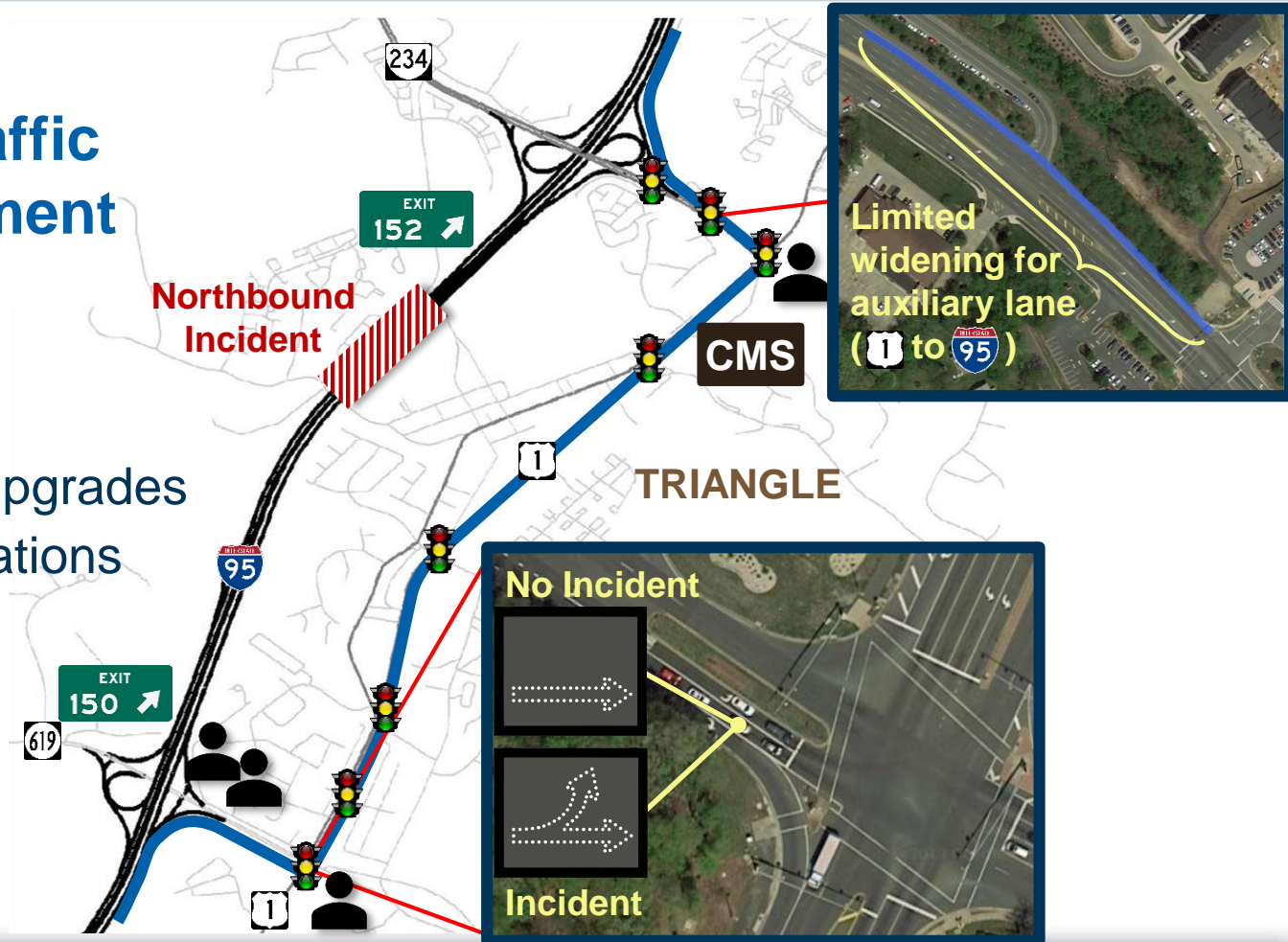
Ramp Metering

7% reduction in travel times on I-95

Parallel Facilities Improvements

Improvements considered for traffic incident management

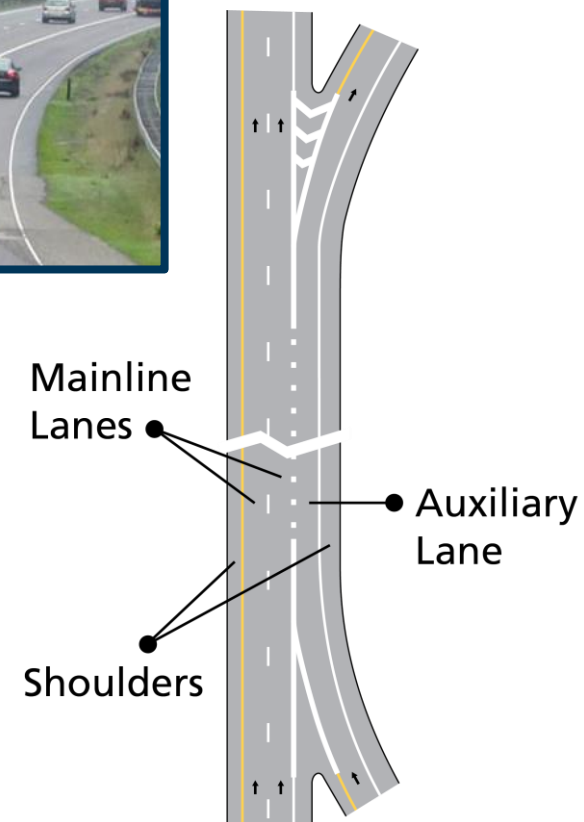
- Message signs
- Traffic control personnel
- Communications upgrades
- Traffic signal operations
- Intersection improvements
- Sign improvements



Highway Capital Improvements

Improvements considered

- Interchange modification and/or reconfiguration
- Acceleration/deceleration lane extensions
- Hard shoulder running lanes
- Auxiliary lanes
- Additional general purpose lanes
- Express lanes
- Ramp widening
- Shoulder widening
- Curve improvements
- Drainage improvements



Multimodal Improvements



Improvements considered

- Long Bridge
- Intercity passenger rail
- Commuter rail
- Commuter bus
- Park & Ride lots
- TDM strategies (carpooling, vanpooling, and slugging)

Commute!VA

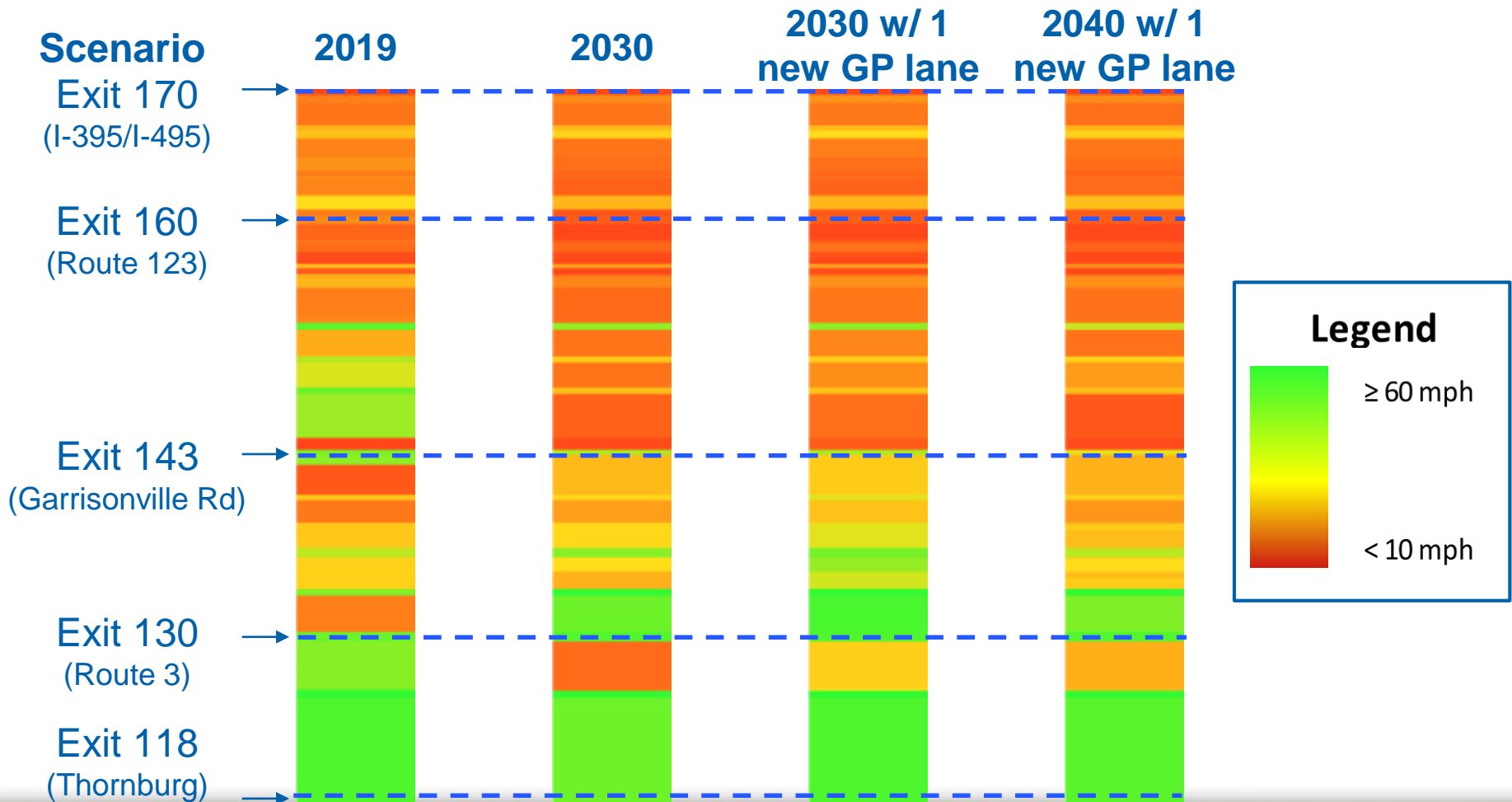


Highway Capacity Improvement Scenario Analyses (Exit 118 to Exit 170)

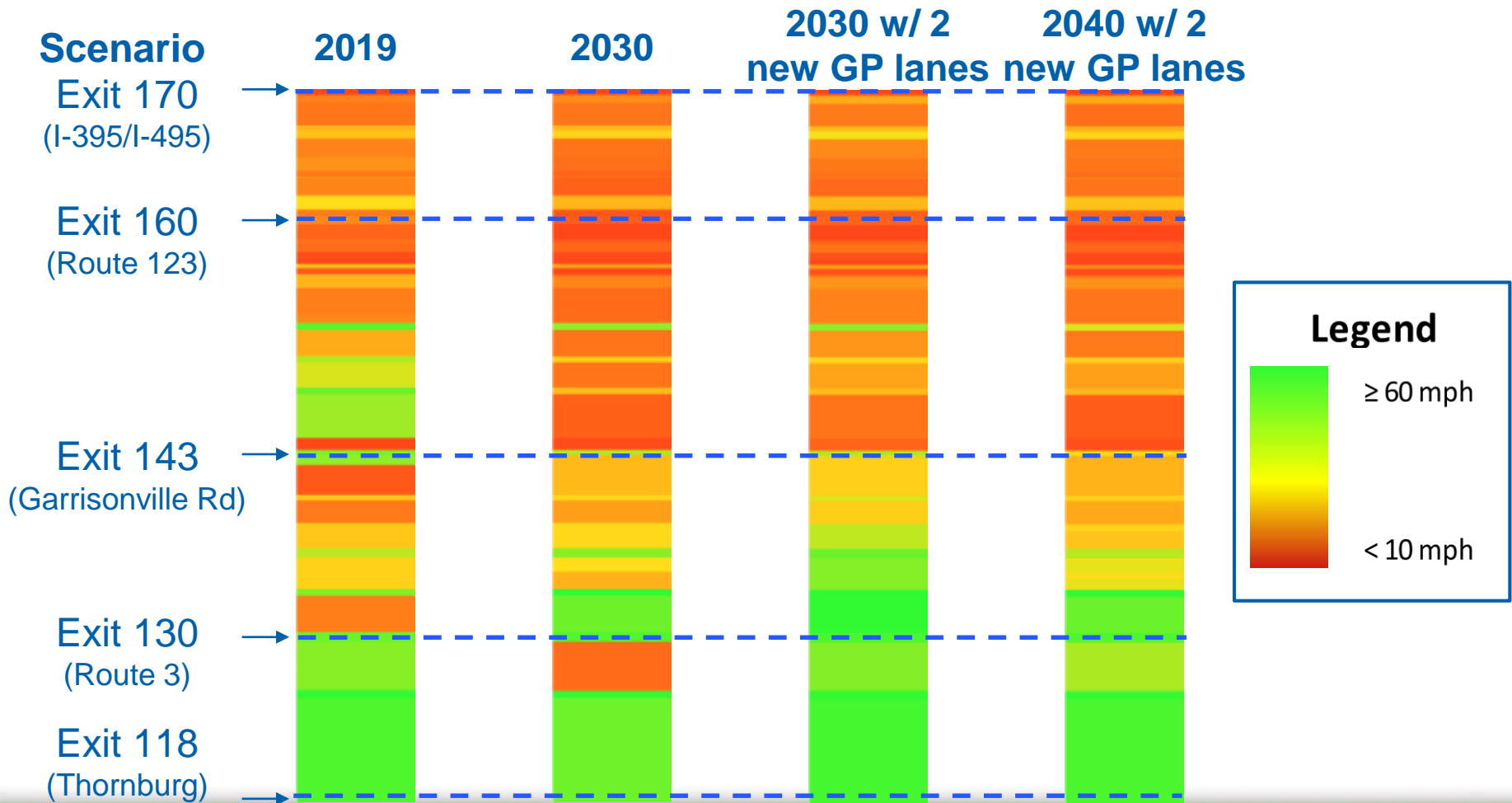
Analysis Summary

- Adding one, two, and three additional 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

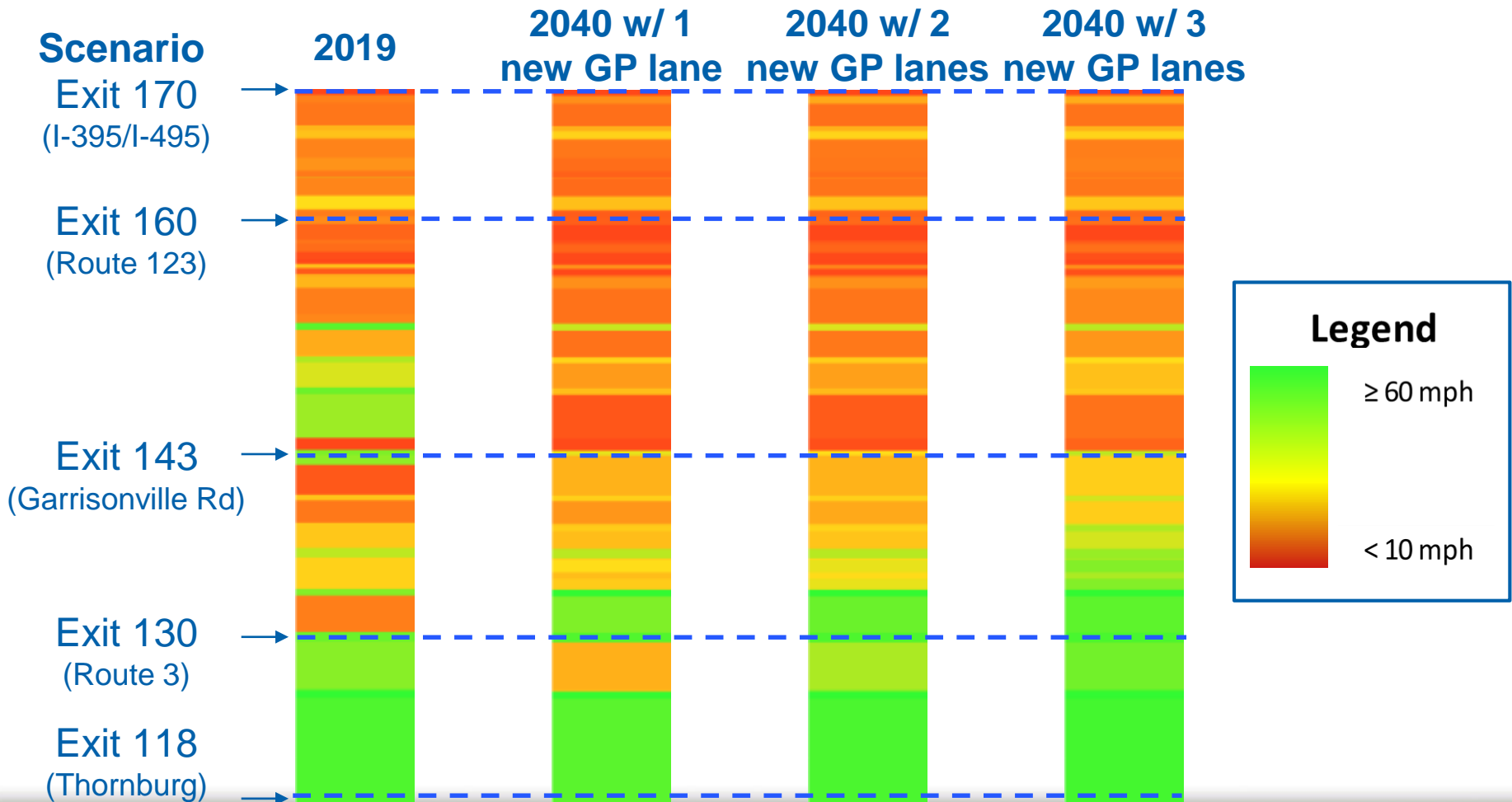
Peak Period Speed Results after Widening



Peak Period Speed Results after Widening

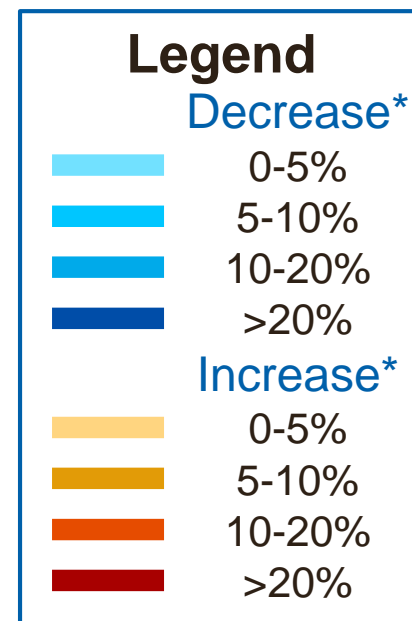
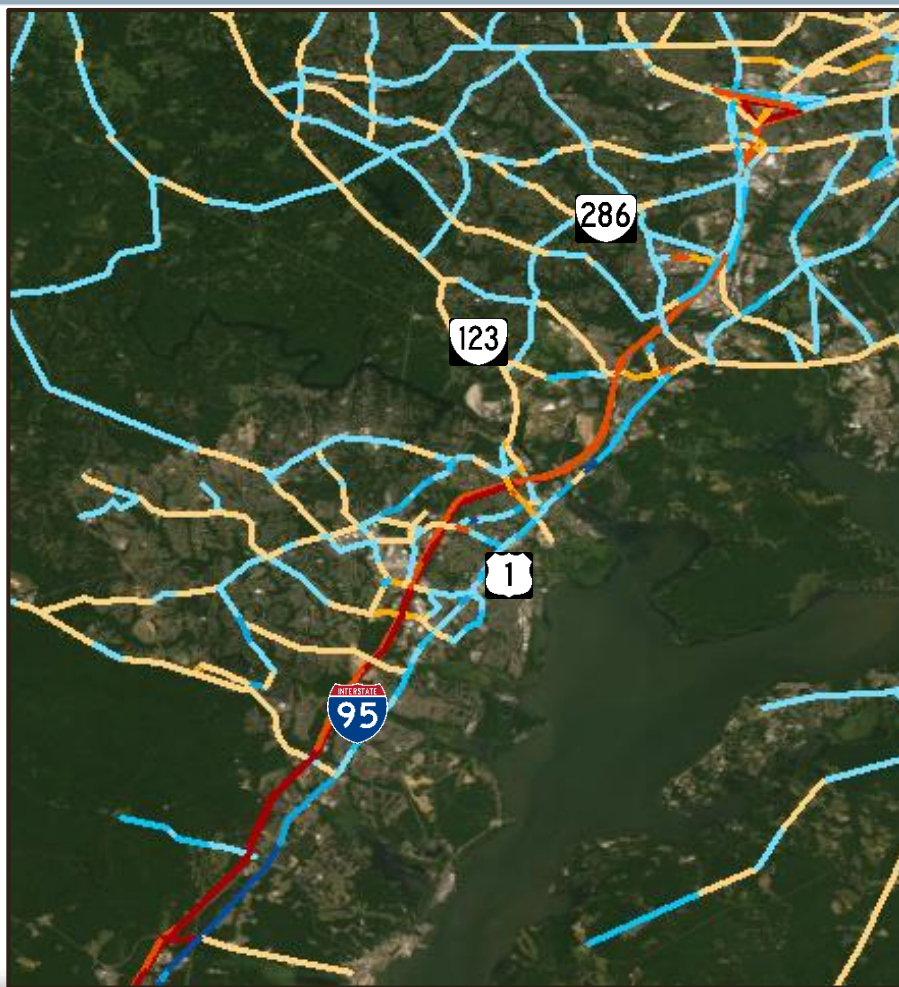


Peak Period Speed Results after Widening



Latent Demand

Change in Daily Volume with an Additional Lane



*Percent change in daily volume from the 2030 No-Build scenario to the 2030 scenario with one additional lane on I-95

Fourth Lane Project Exit 166 to Exit 160



4th Lane Widening Project

- I-95 was widened to four lanes in each direction in 2011
- Average travel speeds in 2018 were down 7.5% compared with 2009
 - 22.3 mph (2009) versus 20.6 mph (2018)



Improvement Highlights

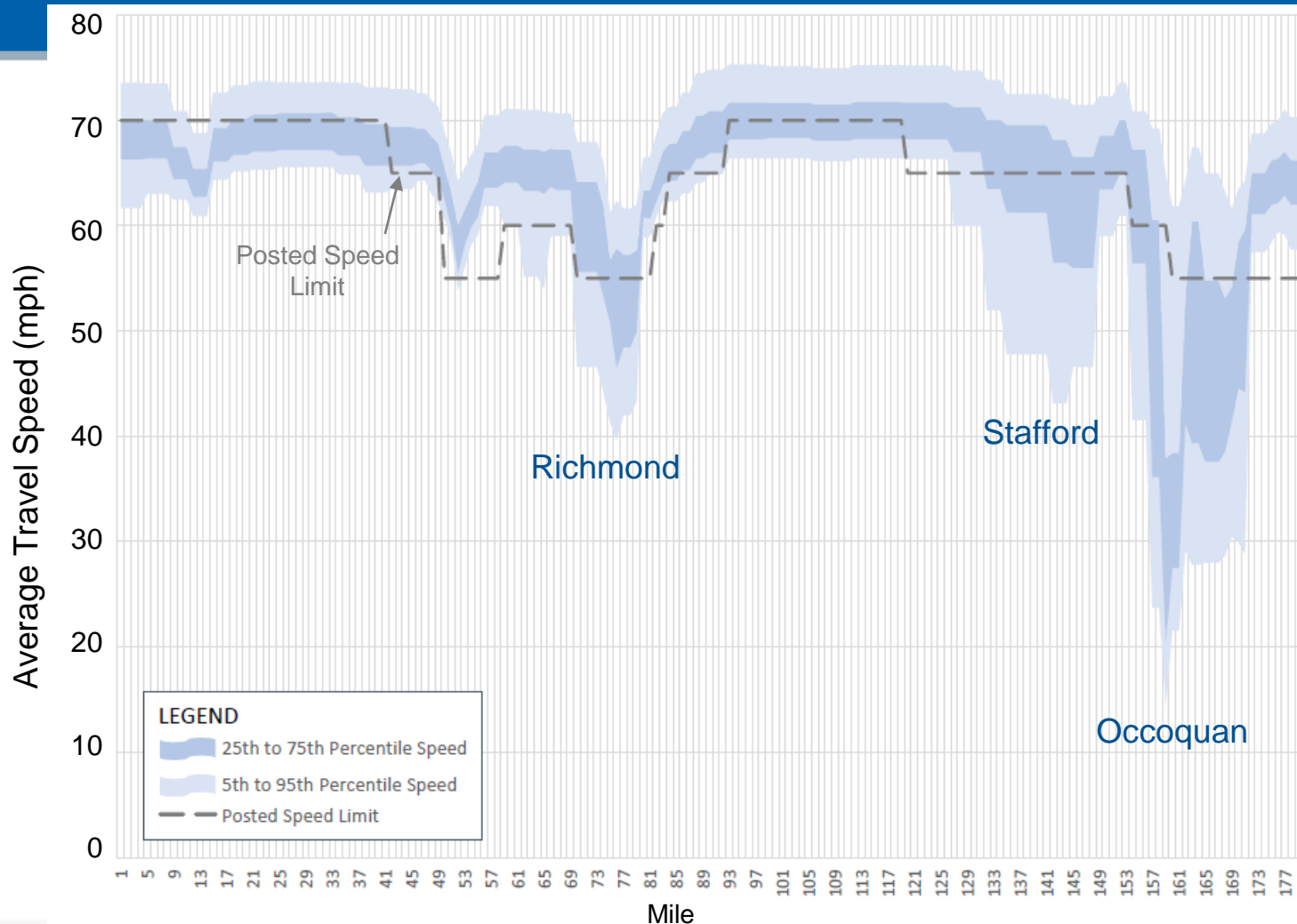


Specific Focus Areas

- Occoquan (near Exit 160)
- I-95/I-64 overlap (Richmond)
- Multimodal improvements

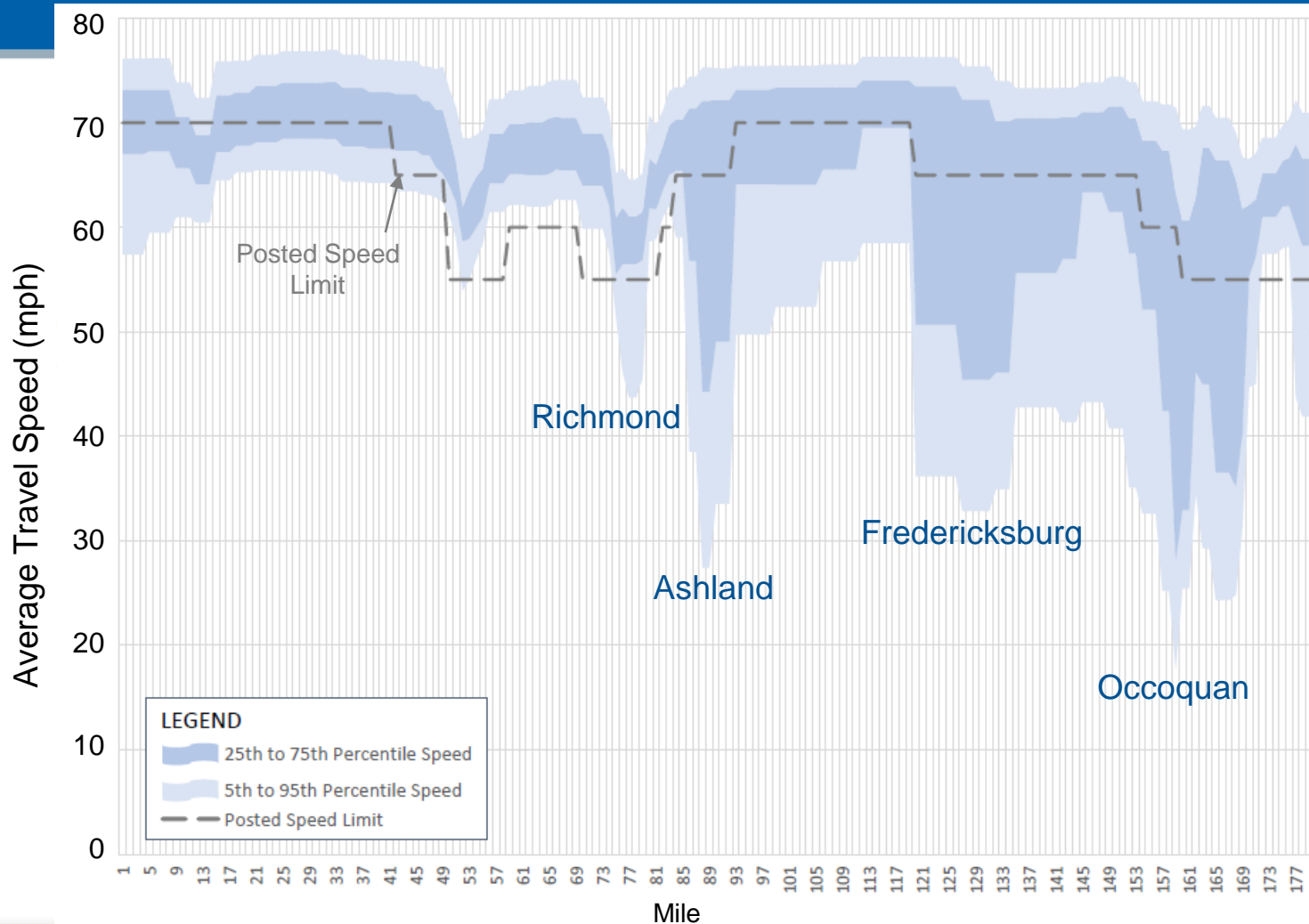
Reliability of Northbound I-95

Typical Weekday Morning



Reliability of Northbound I-95

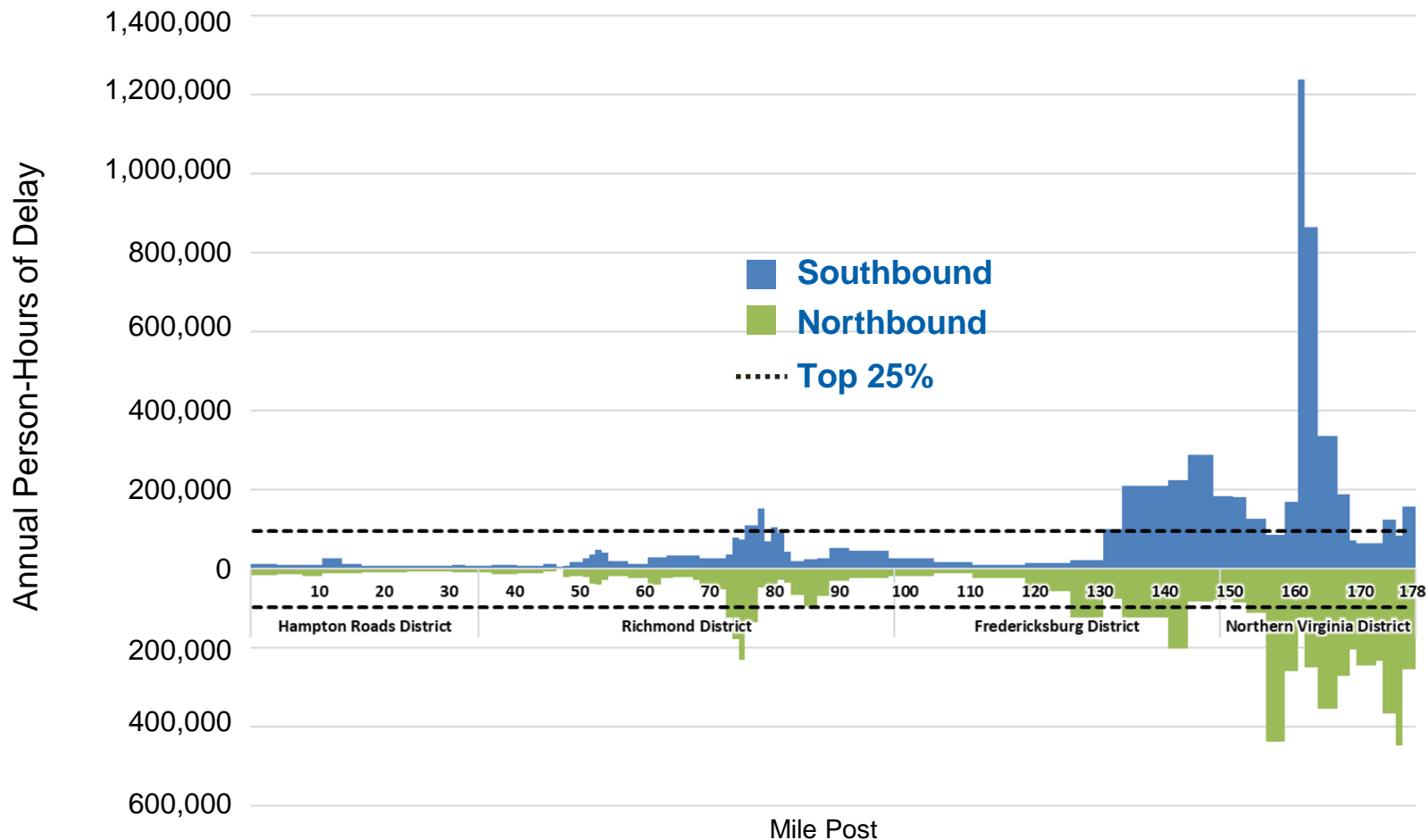
Typical Weekend



Focus Area: Occoquan

2015-2018 Annual Delay Summary

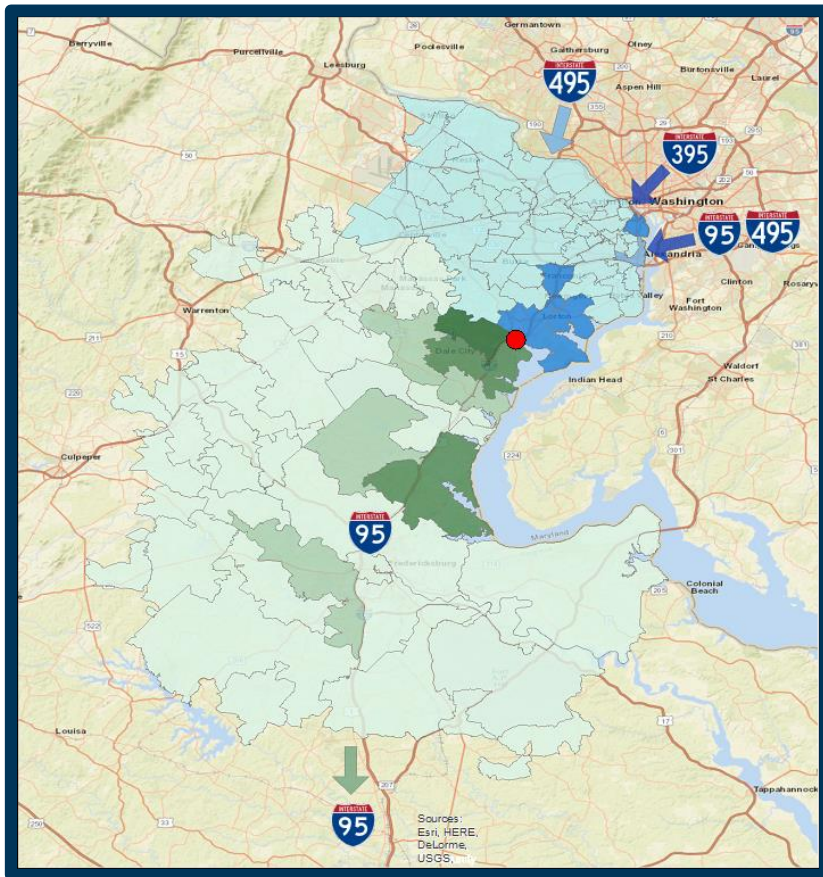
One-Mile Segments



Focus Area: Occoquan

Southbound Origins and Destinations

Tuesday-Thursday PM Peak Period



Top 3 Origins

1. Southbound I-395 from D.C.
2. Southbound I-95/495 from Maryland
3. Fort Belvoir

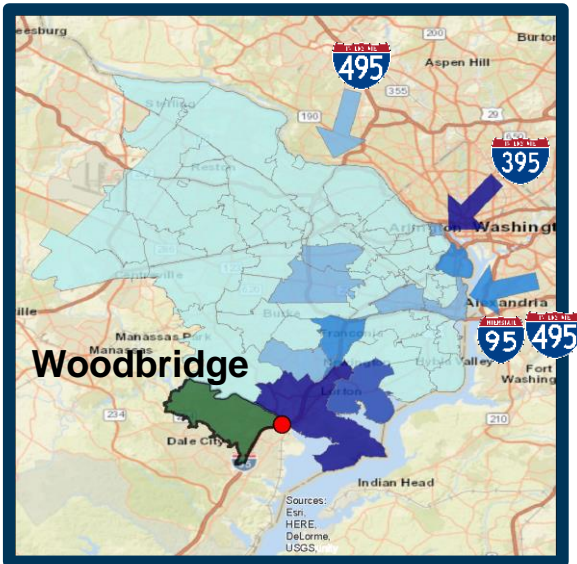
Top 3 Destinations

1. Woodbridge
2. Dale City
3. Stafford

Focus Area: Occoquan

Top 3 Southbound Destinations

Tuesday-Thursday PM Peak

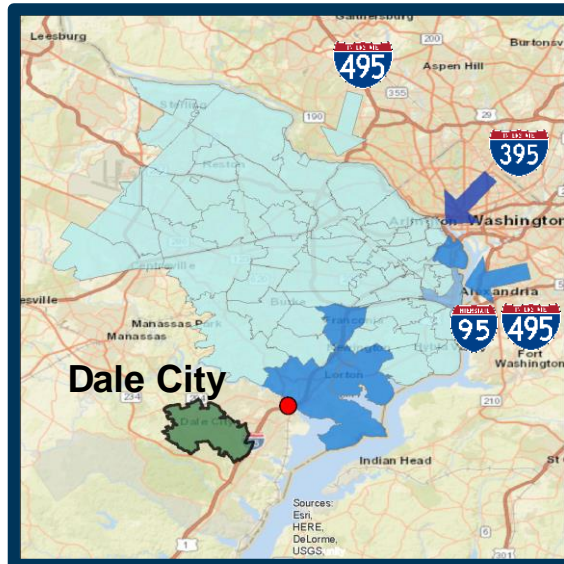


Top 3 Origins to Woodbridge

1. Lorton
2. Southbound I-395 from D.C.
3. Fort Belvoir

Legend

 Occoquan River



Top 3 Origins to Dale City

1. Southbound I-395 from D.C.
2. Fort Belvoir
3. Lorton



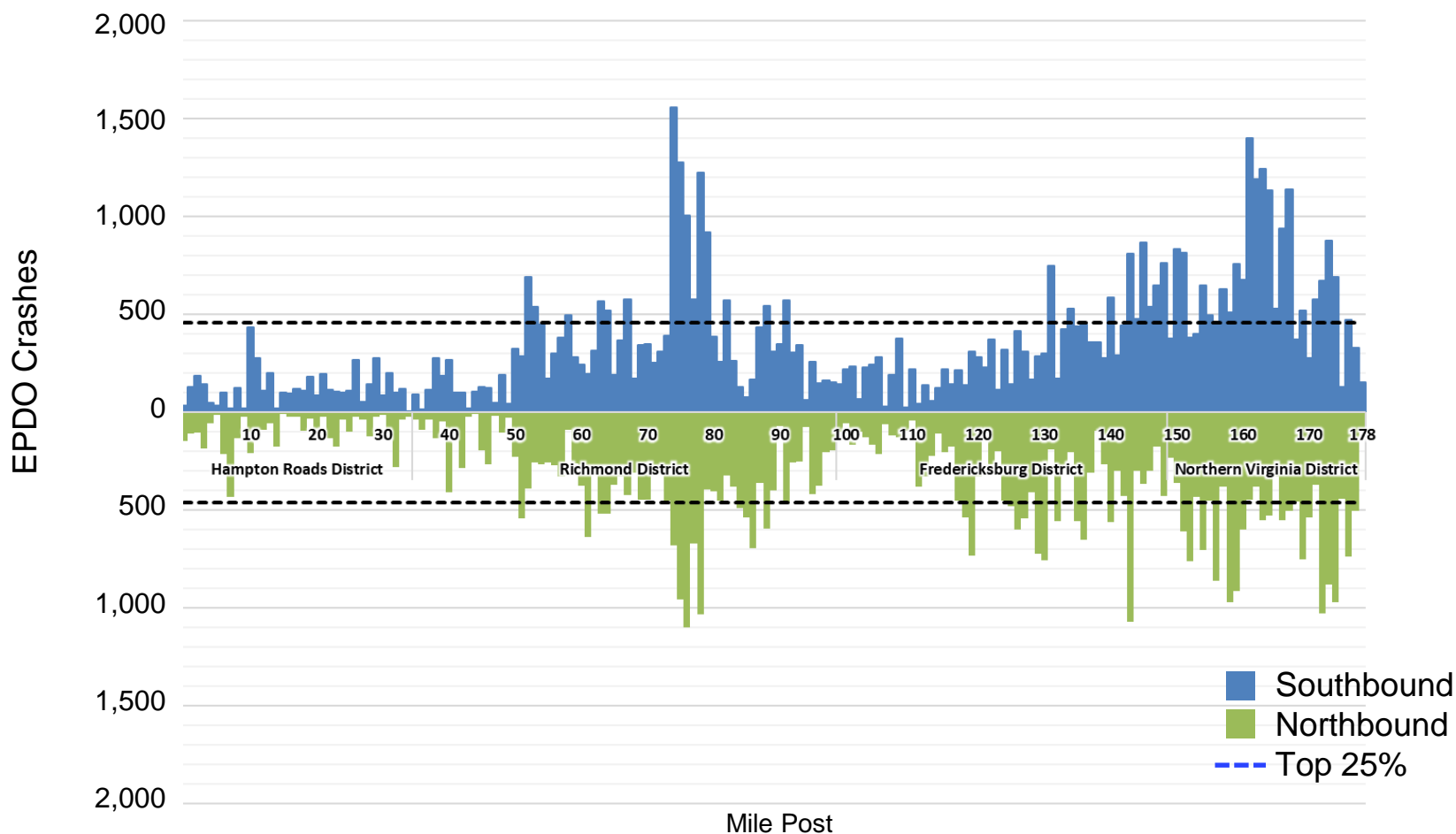
Top 3 Origins to Stafford

1. Arlington
2. Southbound I-395 from D.C.
3. Fort Belvoir

Focus Area: I-95/I-64 Overlap

2015-2018 Crash Frequency/Severity Summary

One-Mile Segments



Focus Area: I-95/I-64 Overlap Proposed Improvements

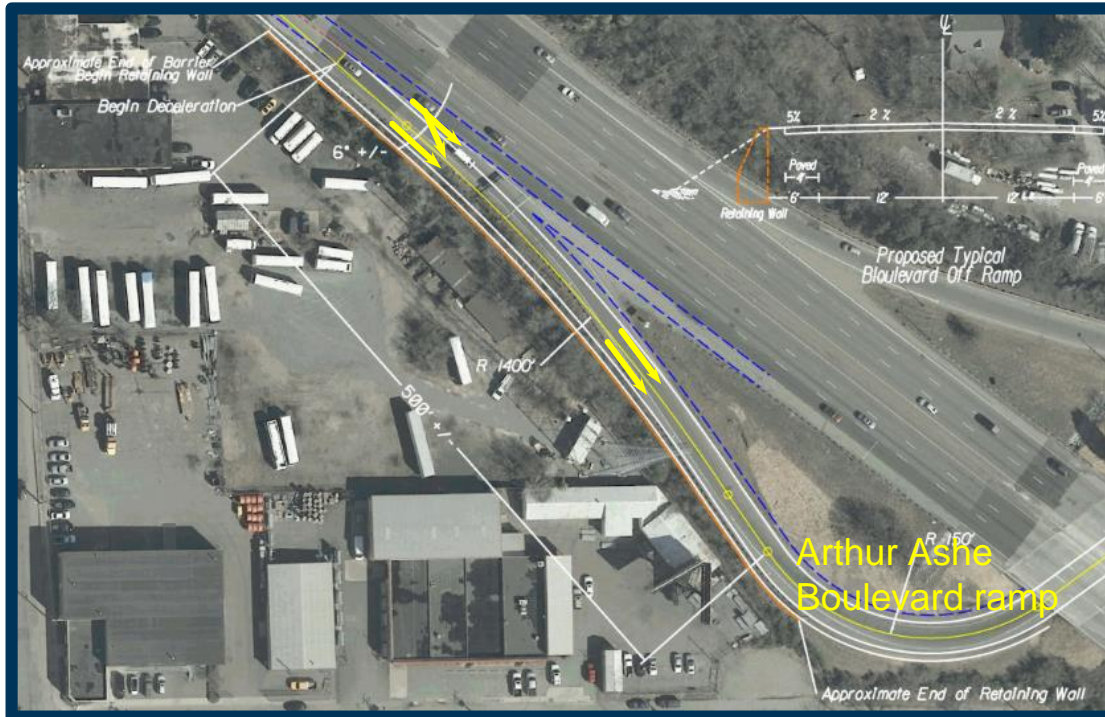


Proposed New Ramp: Laburnum Avenue to I-95 Northbound



- New access to I-95 N from W Laburnum Avenue
- Close Arthur Ashe Boulevard on-ramp to I-95 N to eliminate weave on I-95 N
- Create dual-lane exit to I-64 W
- I-95 N reduced to 2 lanes between I-64 W off-ramp and I-64/I-195 on-ramp

Proposed Lane Reconfiguration: I-95 South to Arthur Ashe Boulevard



- Dual-lane exit from I-95 S onto Arthur Ashe Boulevard ramp (Exit 78)
- I-95 S reduced from 3 to 2 lanes between Exit 79 and I-64/I-195 on-ramp
- Expected to decrease rear-end crashes

Proposed Reconfiguration: 7th St. @ I-95/I-64 E Interchange



- Alternate access from both I-64 E and I-95 N into downtown Richmond and VCU Hospital, a major traffic generator

Proposed Ramp Reconfiguration: I-95 N @ Exit 74C & Oliver Hill Way



- Separates I-95 N to I-64 E traffic eliminating a weave
- I-95 N dual-lane off-ramp to Broad Street
- All current movements maintained
- Eliminates major weave area on I-95 N and expected to reduce weaving crashes

Potential Improvements

GOALS

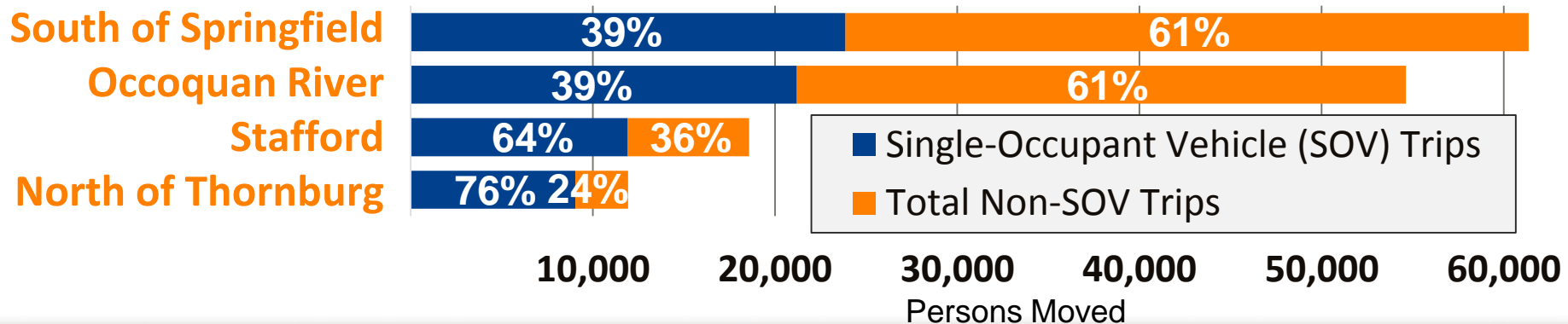
To provide faster, safer, and more reliable travel along the I-95 corridor

- **Additional general purpose lanes do not address these goals on the I-95 corridor**
- **Recommending a multifaceted, multimodal approach**
 - Suite of operational upgrades
 - Additional VRE service
 - Additional commuter bus service
 - Expansion of and/or new park and ride lots
 - Rideshare programs: partner with DOD, specifically Fort Belvoir
 - Hard shoulder running off-peak period (Exit 133 to Exit 160) in both directions



Opportunities to provide fast and reliable trips along the 95 Corridor

- Transit and carpooling offer best opportunities
- Today over 60% of persons moved between Occoquan and I-495 are SOV
- 20-25% increase of transit and carpooling between Spotsylvania County and Dumfries would help improve I-95 performance



Persons Moved Summary



One new general purpose lane

= 2,200-2,400 people per hour



= ~2,000 people per hour

New bus service

2 new VRE trains



= ~3,500 people per hour

New bus service

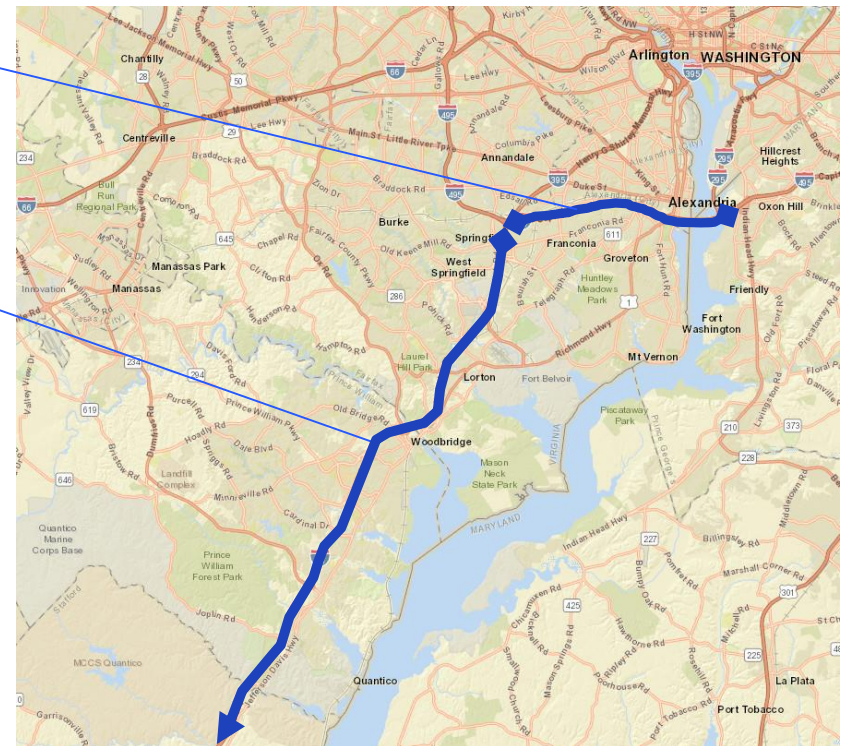
4 new VRE trains



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

Other Major Improvement Recommendations Requiring Further Study

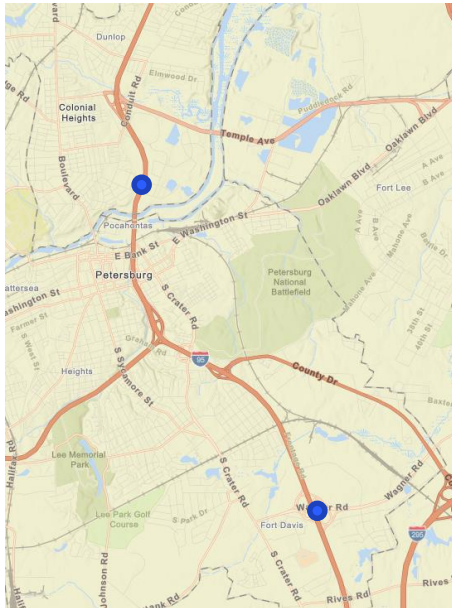
- **I-95/I-495 express lanes**
 - Between Exit 170 and Woodrow Wilson Bridge
- **Bi-directional I-95 express lanes**
 - Between southern terminus and Exit 170
- **Sample interchange evaluations**
 - Exit 160 (Occoquan)
 - Exit 156 (Dale City)
 - Exit 143 (Garrisonville)
 - Exit 126 (Massaponax)



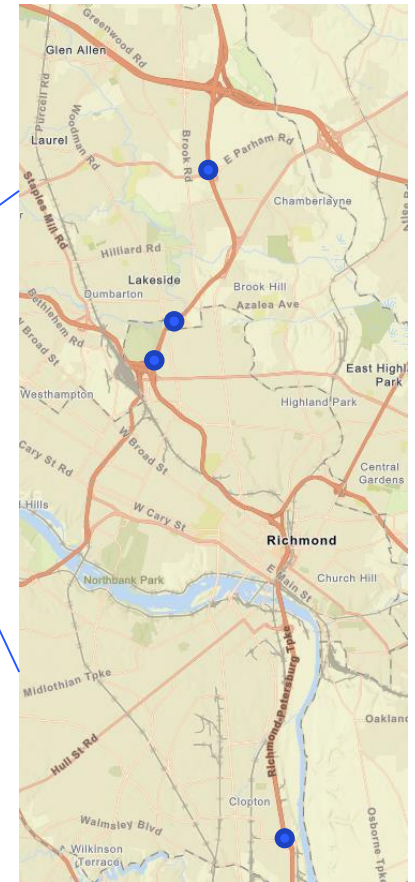
Other Major Improvement Recommendations Requiring Further Study

Sample interchange evaluations

- Exit 83 (Parham Rd)
- Exit 80 (Hermitage Rd)
- Exit 79 (I-64 W)
- Exit 69 (Bells Rd)



- Exit 53 (Southpark Blvd)
- Exit 48 (Wagner Rd)
- Exit 11 (Emporia)



Additional Boards

Operations

- Operational and Freeway Improvement Strategies
- Quick Clearance Towing and Safety Service Patrol Coverage
- Arterial Strategies to Improve Incident Management

Multimodal

- Potential Multimodal Improvements
- Long Bridge Project Summary
- DC2RVA Intercity Passenger Rail Improvements

Next Steps

- **Commonwealth Transportation Board updates**
- **October 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

Home

About The CTB ▾

Planning & Funding ▾

Projects ▾

Meetings & News ▾

Contact Us ▾



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

Sustainability of Transportation Revenues

Nick Donohue, Deputy Secretary of Transportation
October 16, 2019



Virginia Department of Rail and Public Transportation



2019 Appropriations Act

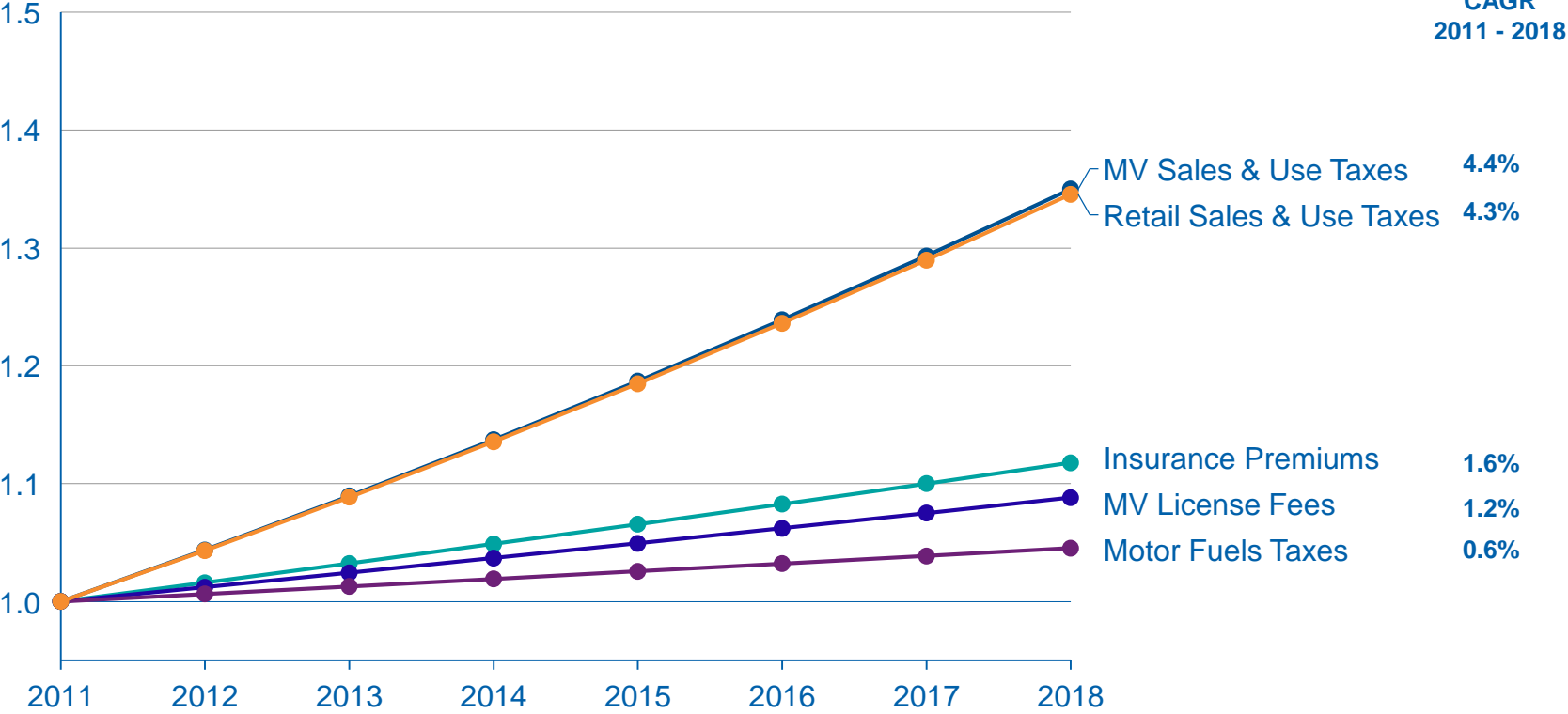
- **It is the intent of the General Assembly Secretary of Transportation and Commonwealth Transportation Board shall... evaluate**
 - **(i) the impact of increased fuel efficiency and increased use of hybrid and electric vehicles on transportation revenues, and**
 - **(ii) potential options to provide a sustainable funding stream for transportation infrastructure**

How is transportation funded in Virginia

CTF Sources	CTF Revenues (FY2018)
Gas Tax	\$638.3
Diesel Tax/Road Tax	\$216.9
Registration Fees/IRP	\$328.0
Motor Vehicle Sales Tax	\$943.7
Retail Sales Tax	\$1,043.8
Insurance Premiums	\$168.0
Misc.	\$107.6

Not all revenue sources are created equal

Revenue Growth Indexed to 2011 Tax Rates^{(a)(b)(c)}



Note(s): (a) Insurance Premiums and MV Licenses Fees are not indexed – instead their revenues are depicted above; (b) Tax rates are as follows: (i) Gas excise tax rates, 2011-2012=0.175 cpg, 2013-2014=0.111 cpg; 2015-2018=0.162 cpg; (ii) Diesel excise tax rates, 2011-2012=0.175 cpg, 2013-2018=0.202 cpg; (iii) MV Sales and Use, 2011-2013=3.00%, 2014=4.00%, 2015=4.05%, 2016=4.10% 2017-2018=4.15%; (iv) Retail tax rates, 2011-2012=0.5%, 2013-2018=0.8%, with additional 0.7% for NoVA and HR; (c) Curves have been smoothed using CAGRs

• Source(s): VDOT

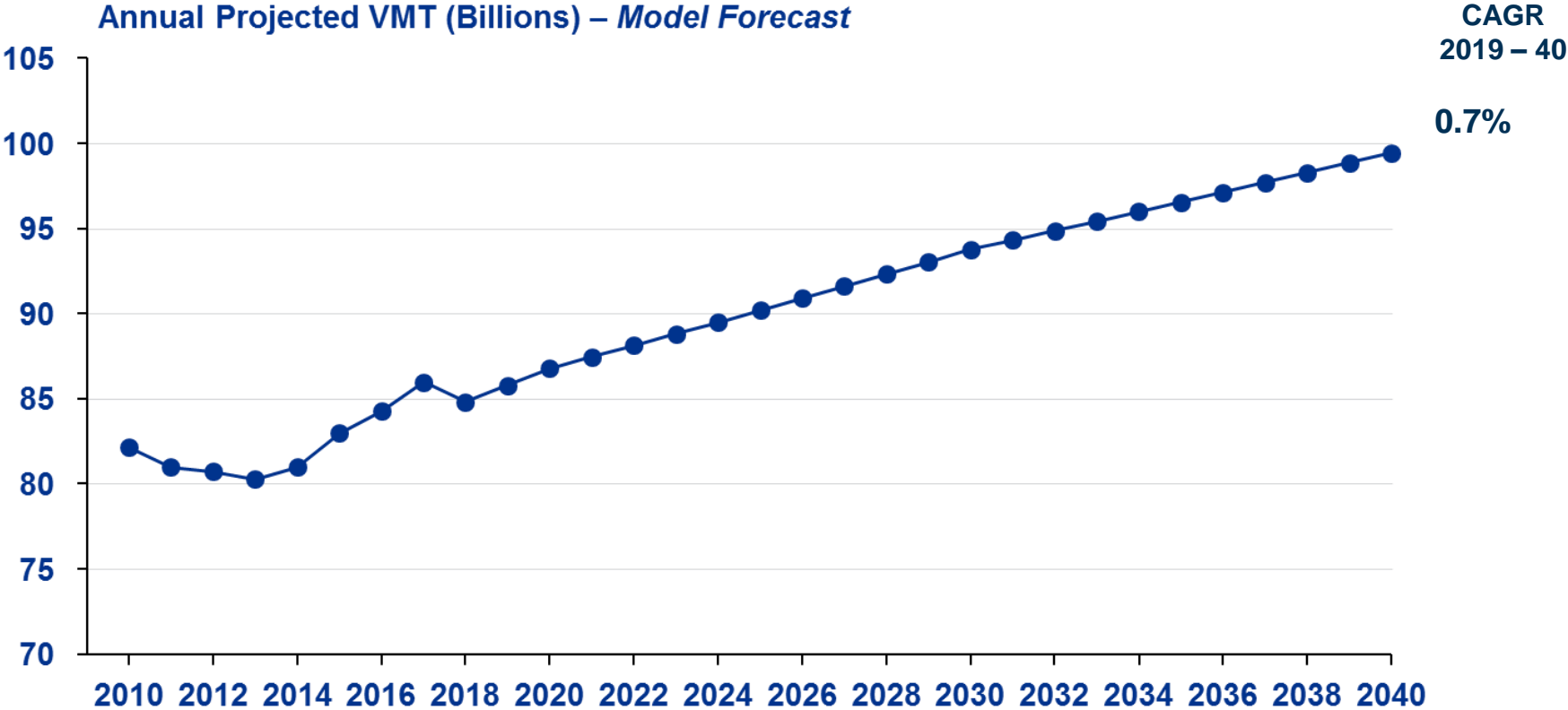
Fuel tax collections FY16-18

- **Vehicle miles traveled increased 3.2%**
- **Fuel tax collections decreased 0.4%**
- **First time driving increased and fuel tax collections decreased at the same time, without a change in rate**
- **In FY18 fuel tax collections would have been \$31.3M higher if they had kept pace with driving**

FY19 fuel tax collections

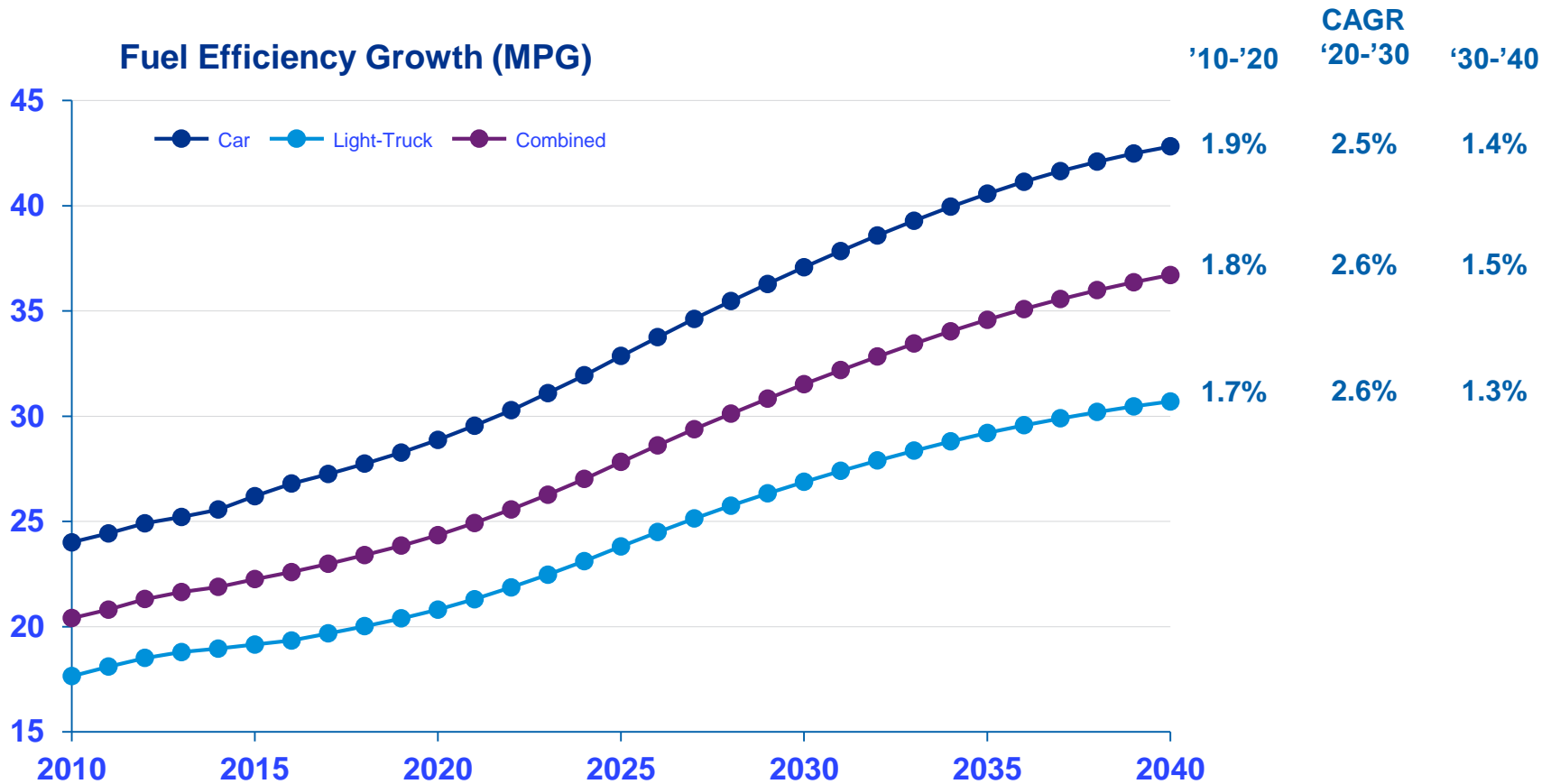
Fiscal Year	Forecasts	Actuals
FY16	\$883.5	\$860.1
FY17	\$868.9	\$872.2
FY18	\$898.7	\$857.2
FY19 (thru June)	\$905.5	\$856.6

Forecast Vehicle Miles Traveled (VMT)



Source: Virginia DMV; US Census Bureau; KPMG analysis (population regression)

Internal Combustion Engine Efficiency Gains

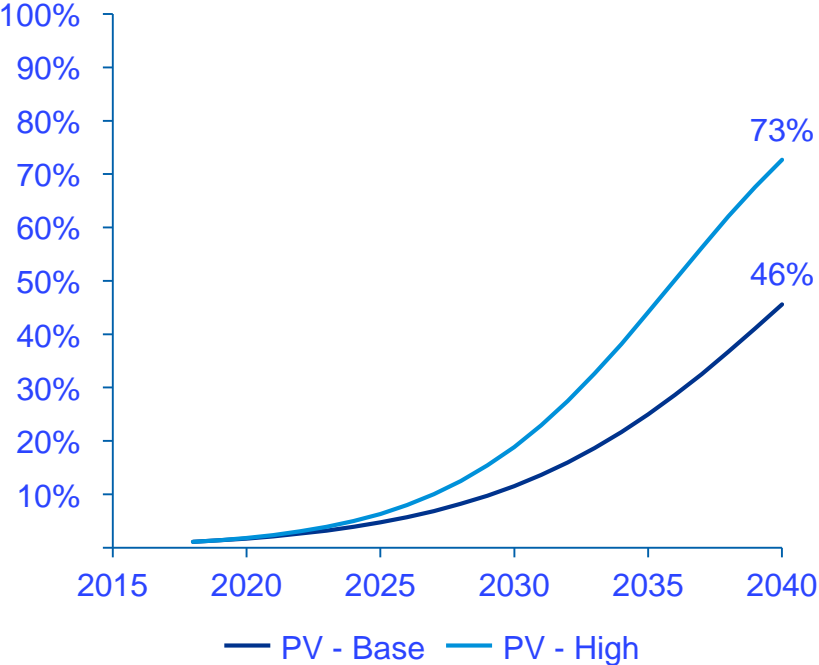


Source(s): Energy Information Administration (EIA); Bureau of Transportation Statistics (BTS)

KPMG Forecast Electric Vehicle Adoption

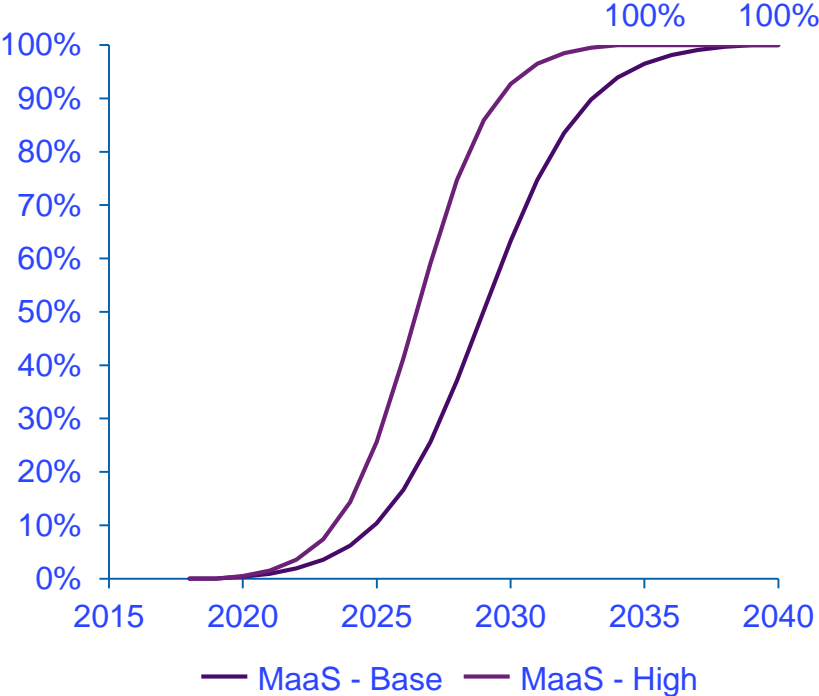
EV Adoption

Personally-owned Vehicles



EV Adoption

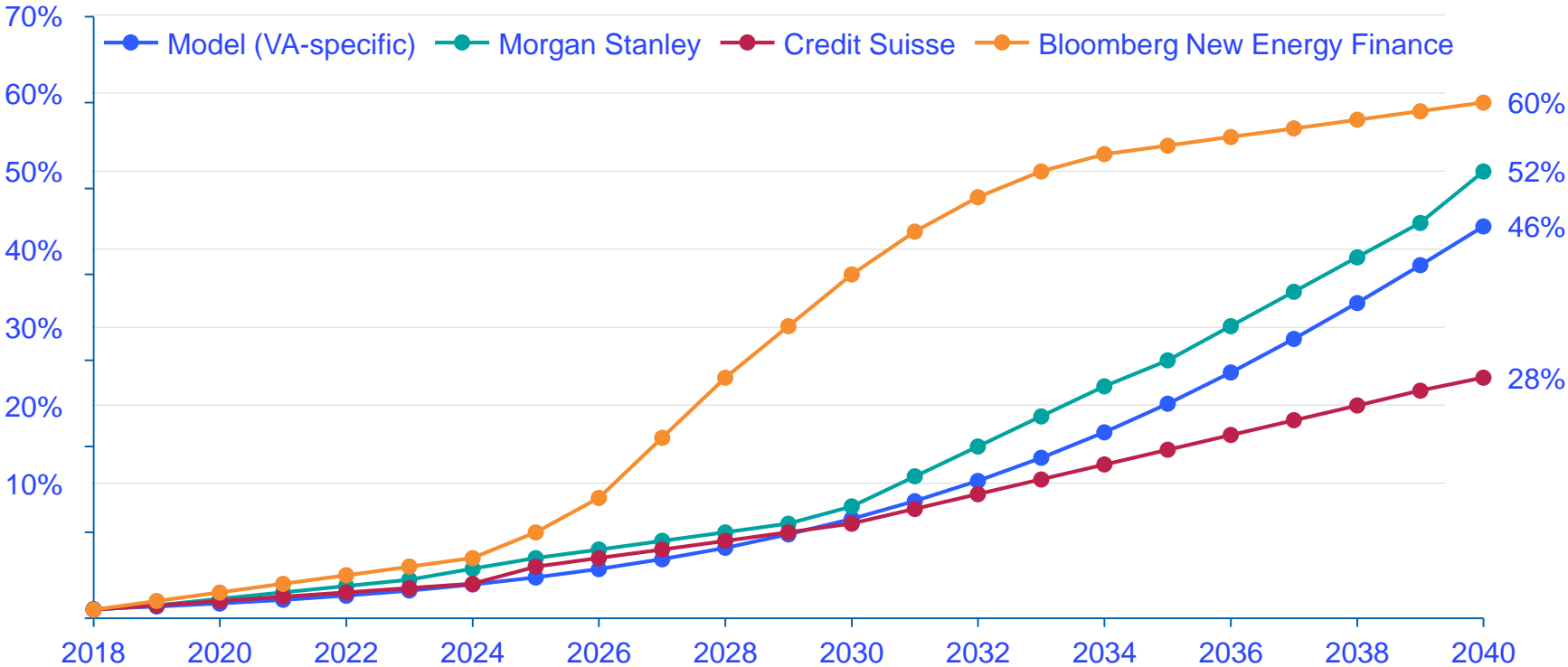
Mobility as a Service Vehicles



Note(s): Assumes 100% EV penetration for personal vehicles in 50-60 years and 15-20 years for MaaS vehicles, respectively
 Source(s): KPMG Analysis

Comparison of EV adoption rates

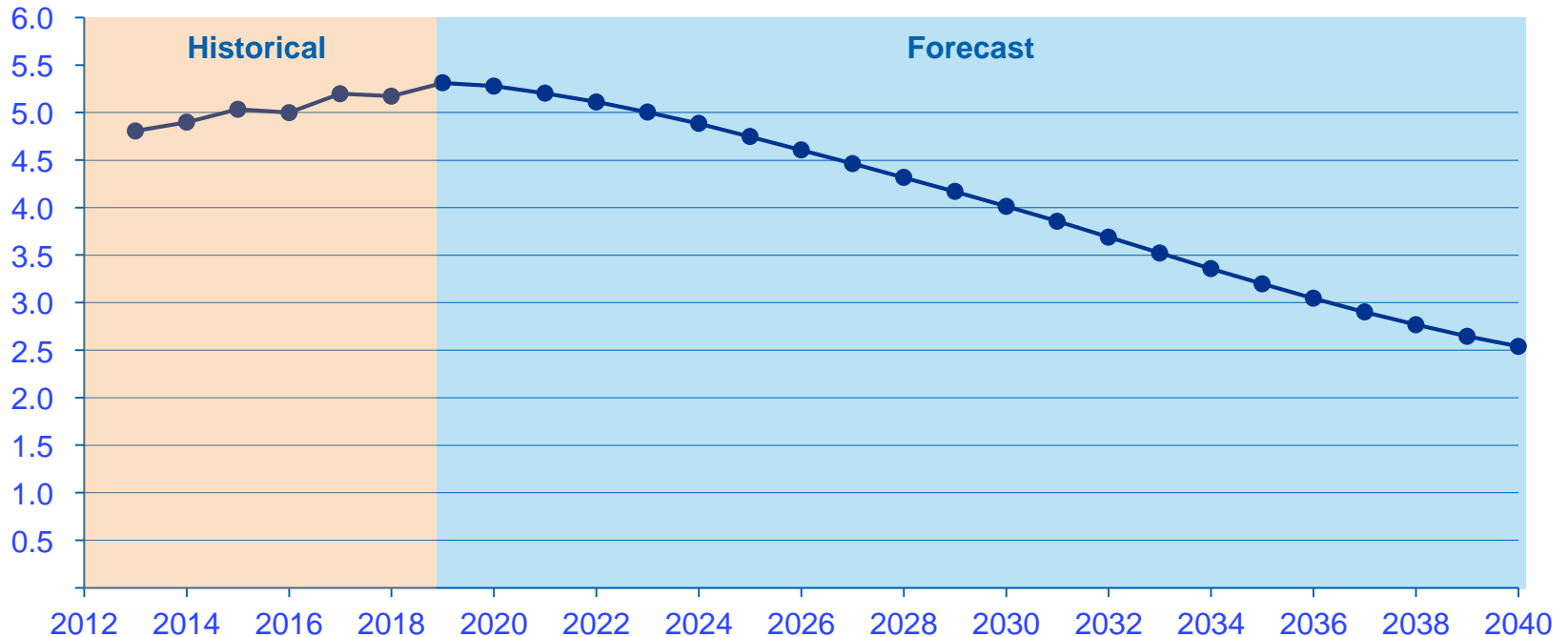
Electric Vehicle Adoption Estimates (Share of Sales)



Note: Model estimates are specific to Virginia; all others are U.S. National figures
 Source(s): Morgan Stanley Electric Vehicle Market Monitor (June 2019); Bloomberg New Energy Outlook (May 2019); KPMG Analysis

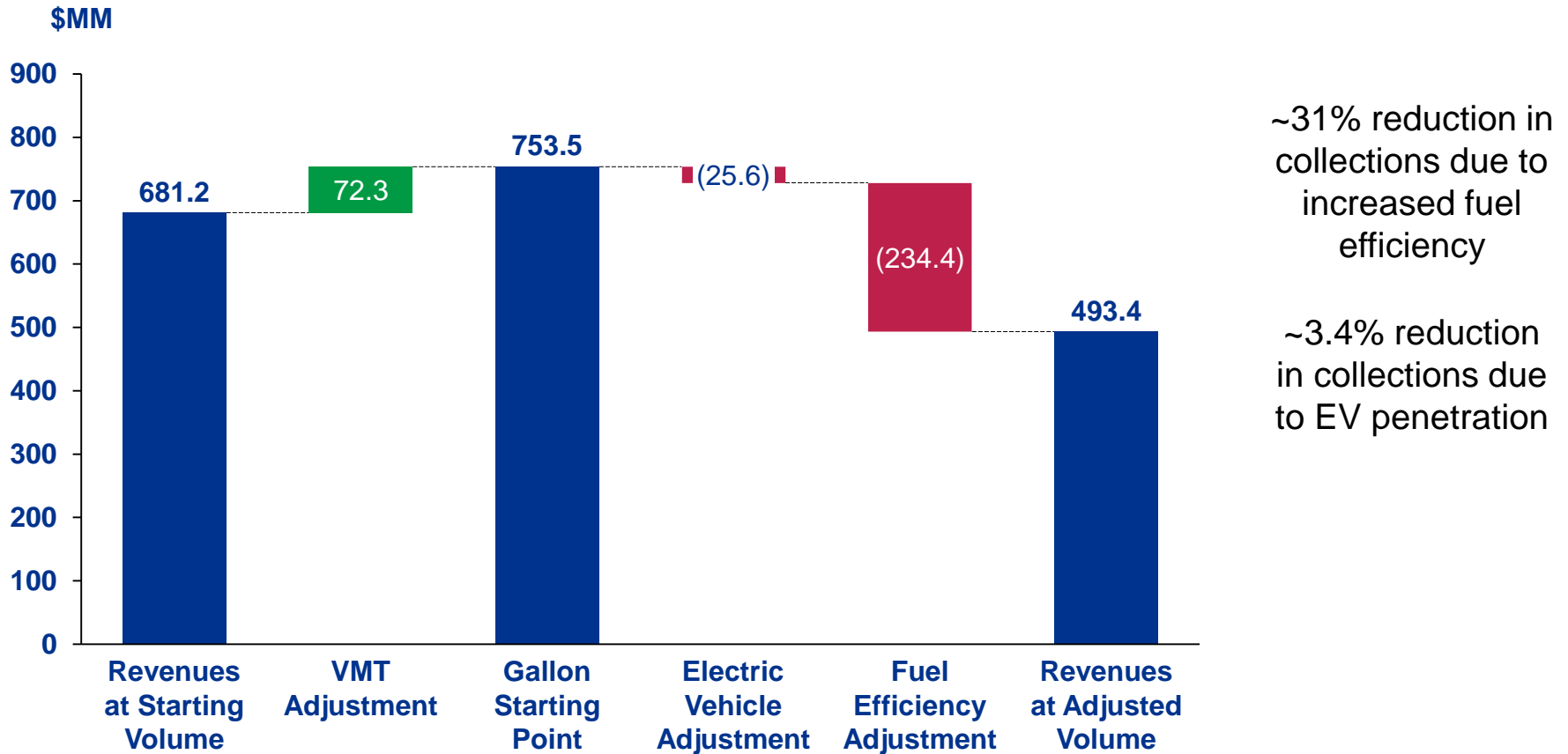
KPMG Forecast Fuel Consumption

Fuel Consumption
(Billion Gallons)



Notes: Includes both gasoline and diesel used for transportation
Source(s): Virginia DMV; KPMG analysis

KPMG Forecast Gas Tax Collections (2030)

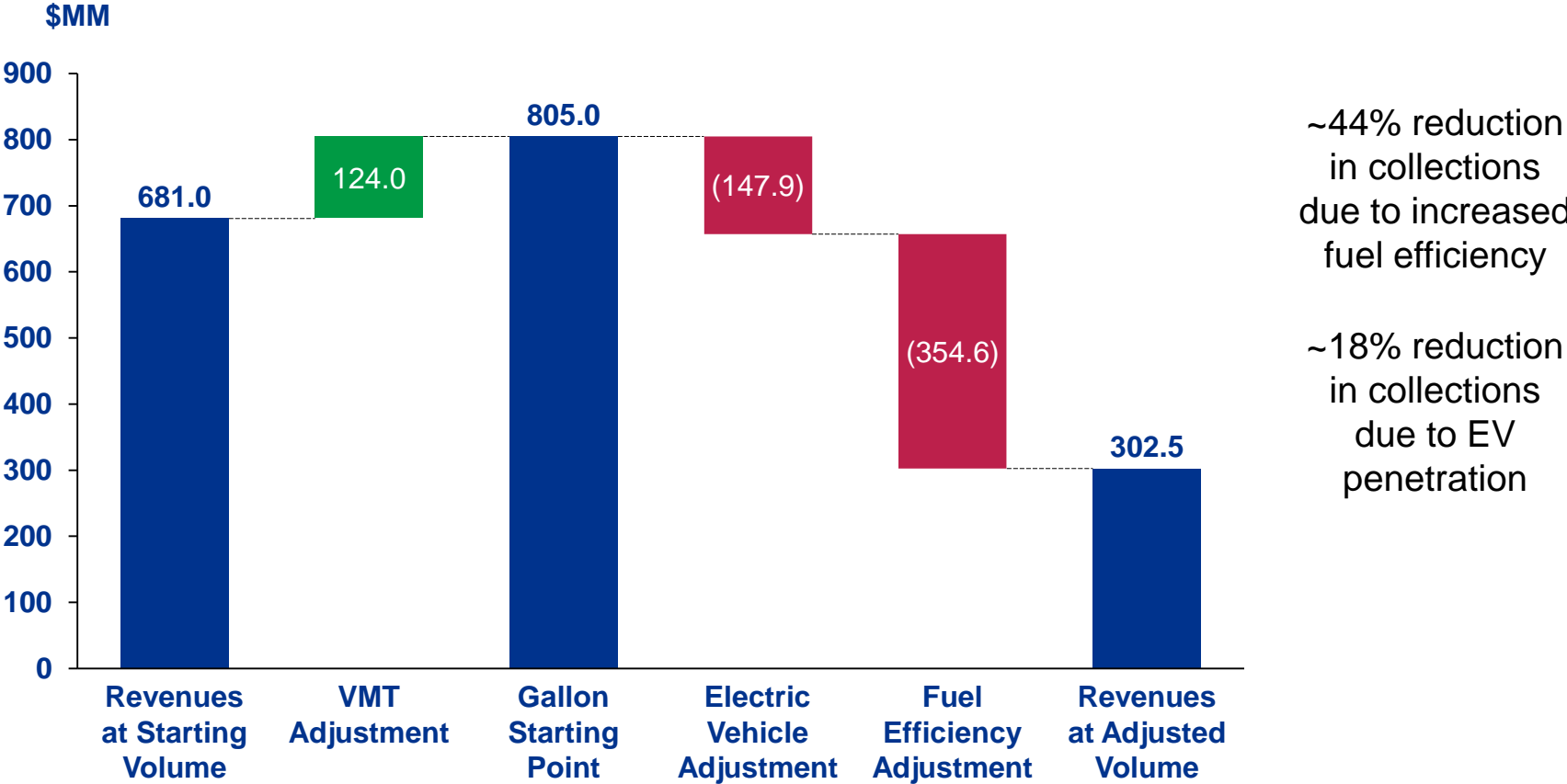


Source(s): KPMG Analysis



© 2019 KPMG LLP, a Delaware limited liability partnership and the U.S. member firm of the KPMG network of independent member firms affiliated with KPMG International Cooperative (“KPMG International”), a Swiss entity. All rights reserved.

KPMG Forecast Gas Tax Collections (2040)

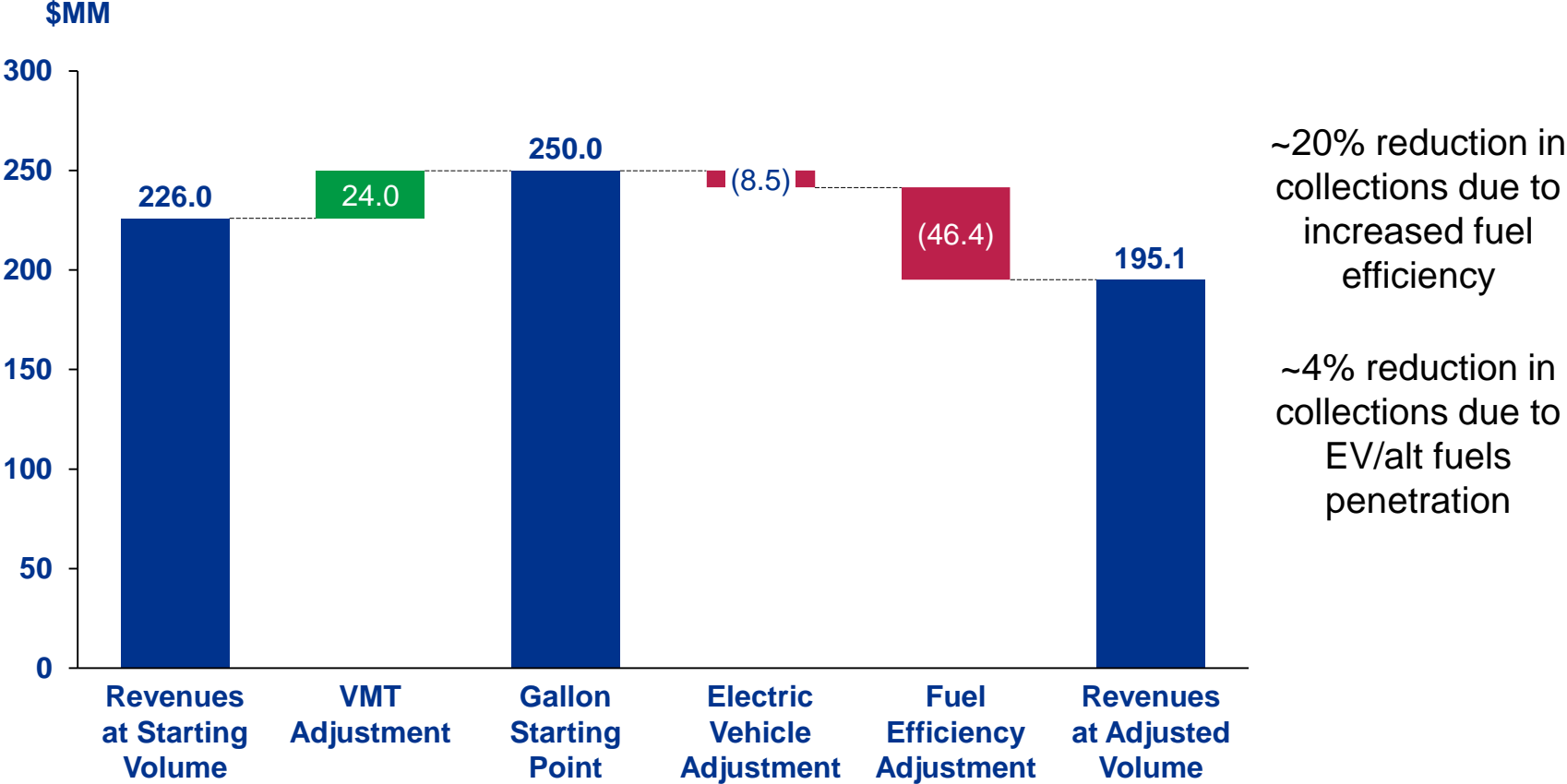


Source(s): KPMG Analysis



© 2019 KPMG LLP, a Delaware limited liability partnership and the U.S. member firm of the KPMG network of independent member firms affiliated with KPMG International Cooperative (“KPMG International”), a Swiss entity. All rights reserved.

KPMG Forecast Diesel Tax Collections (2030)

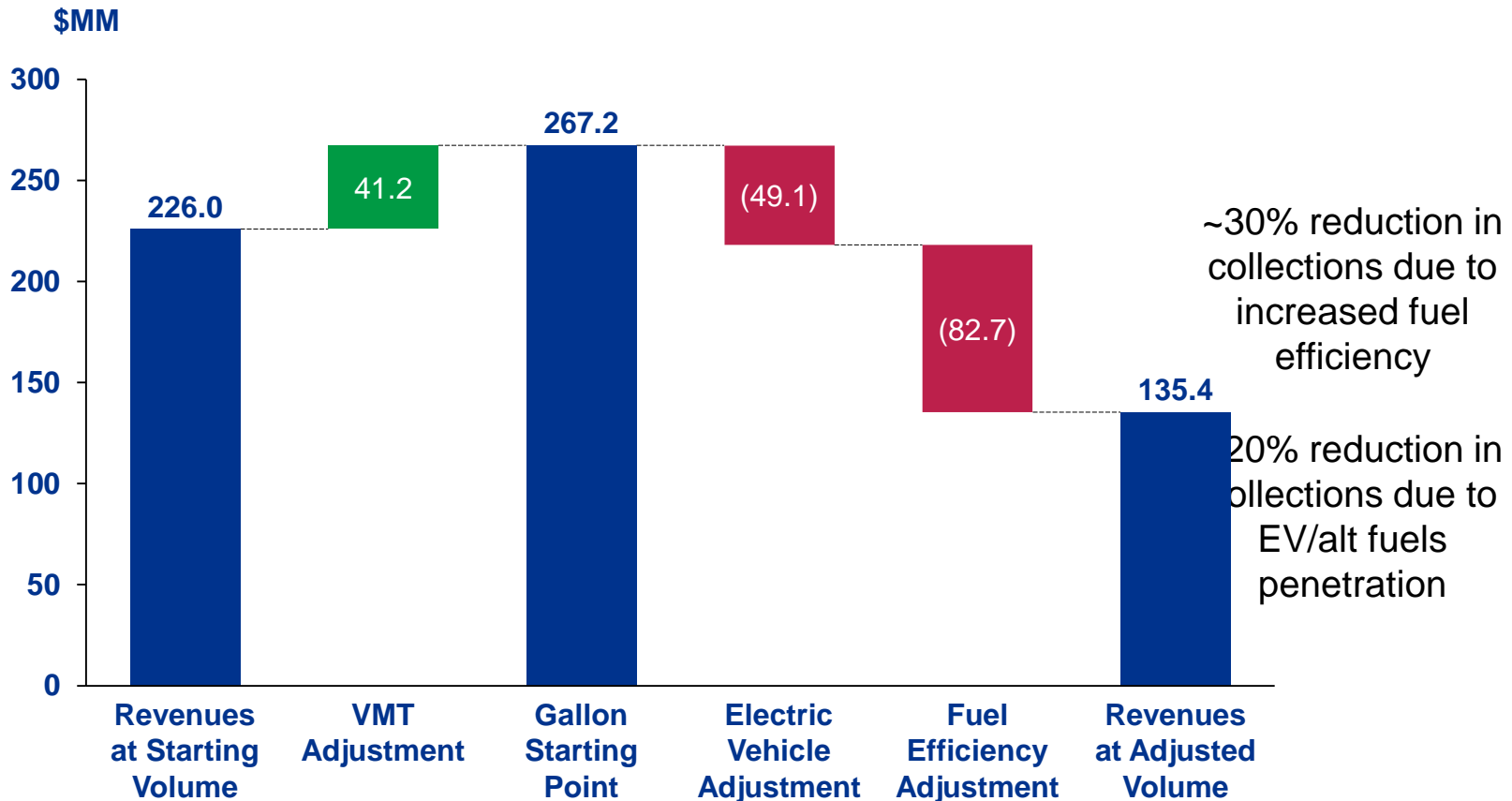


Source(s): KPMG Analysis



© 2019 KPMG LLP, a Delaware limited liability partnership and the U.S. member firm of the KPMG network of independent member firms affiliated with KPMG International Cooperative (“KPMG International”), a Swiss entity. All rights reserved.

KPMG Forecast Diesel Tax Collections (2040)



Source(s): KPMG Analysis



© 2019 KPMG LLP, a Delaware limited liability partnership and the U.S. member firm of the KPMG network of independent member firms affiliated with KPMG International Cooperative (“KPMG International”), a Swiss entity. All rights reserved.

Fuel Tax Collections

- **Greater near-term and mid-term risks from increased fuel efficiency**
- **Greater long-term risk from increased EV penetration into the fleet mix**
- **In 2030, fuel tax collections would be \$1,117MM if they grew at the same rate as inflation**

Fuel Efficiency Examples

Toyota Camry			
Model Year	MPG	Tax Paid	Δ Tax Paid %
2000	23	\$ 81.70	-
2009	25	\$ 75.17	(8%)
2019	34	\$ 55.27	(32%)
2019 Hybrid	52	\$ 36.14	(56%)

Chevy Malibu			
Model Year	MPG	Tax Paid	Δ Tax Paid %
2000	22	\$ 85.42	-
2009	23	\$ 81.70	(4%)
2019	29	\$ 64.80	(24%)

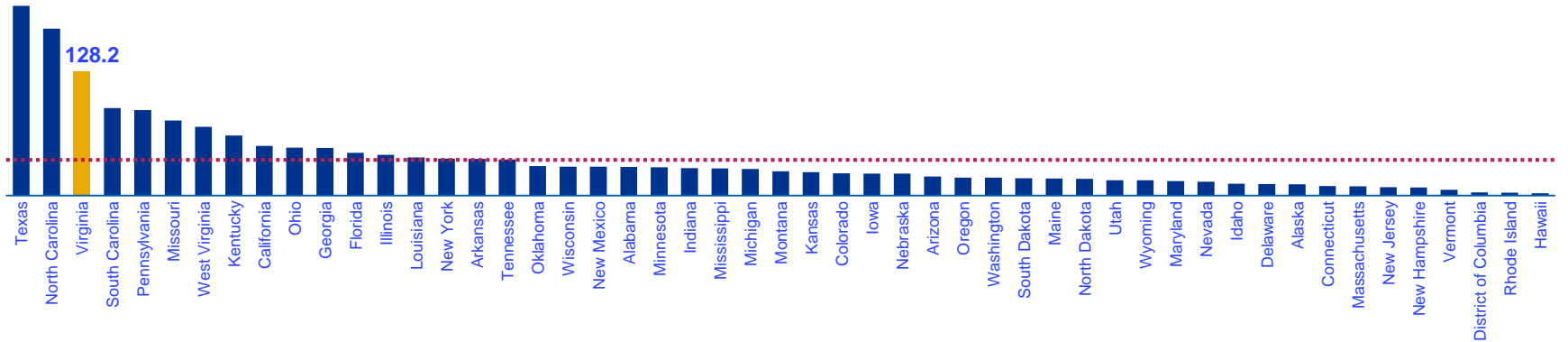
Hyundai Sonata			
Model Year	MPG	Tax Paid	Δ Tax Paid %
2000	21	\$ 89.49	-
2009	24	\$ 78.30	(13%)
2019	28	\$ 66.32	(26%)
2019 Hybrid	42	\$ 44.74	(50%)

Ford F150 (2WD)			
Model Year	MPG	Tax Paid	Δ Tax Paid %
2000	16	\$ 120.46	
2009	17	\$ 110.54	(8%)
2019	20	\$ 93.96	(22%)

Scope of Transportation Network

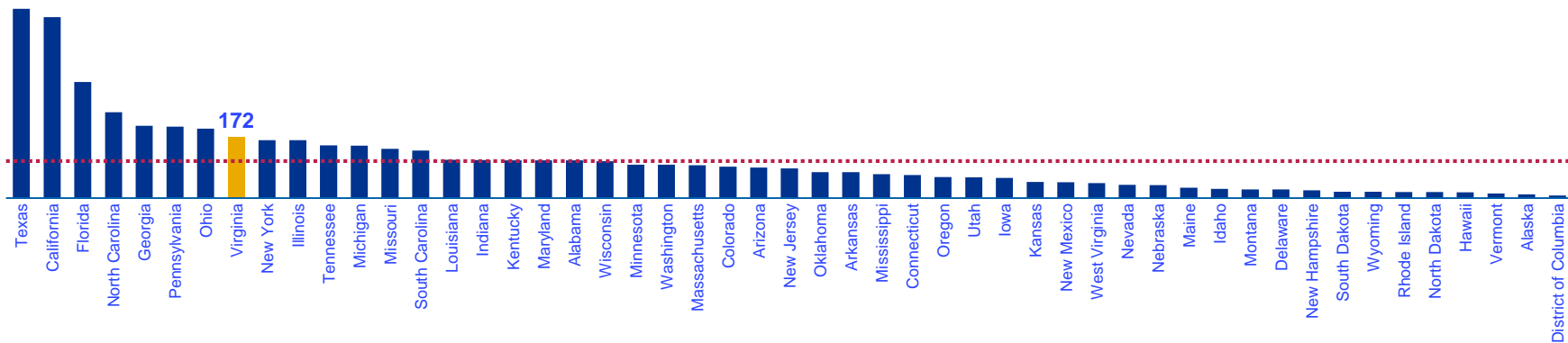
Average = 36,920 mi.

Agency-managed Lane Miles (in 000s of Lane Miles)



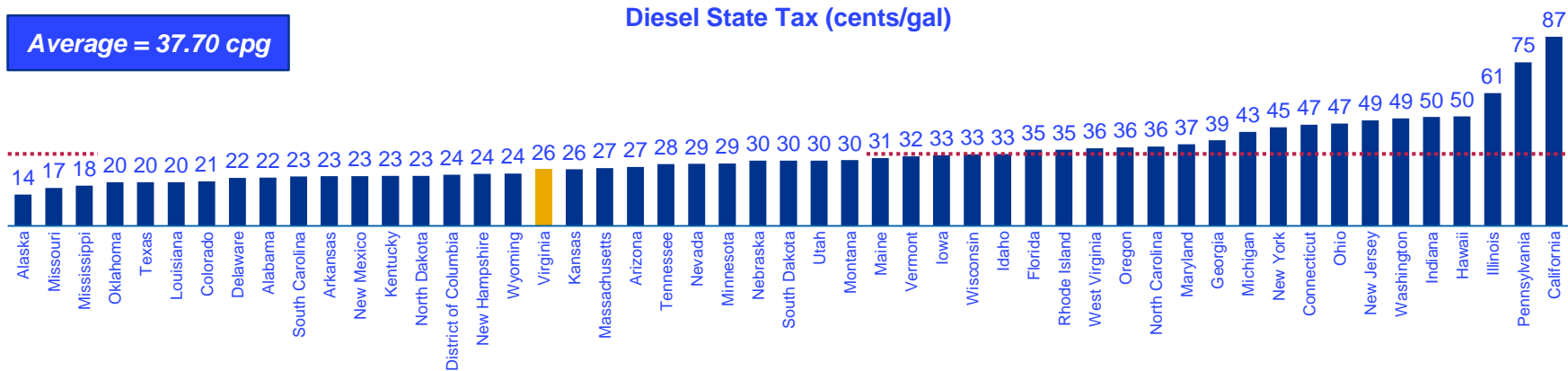
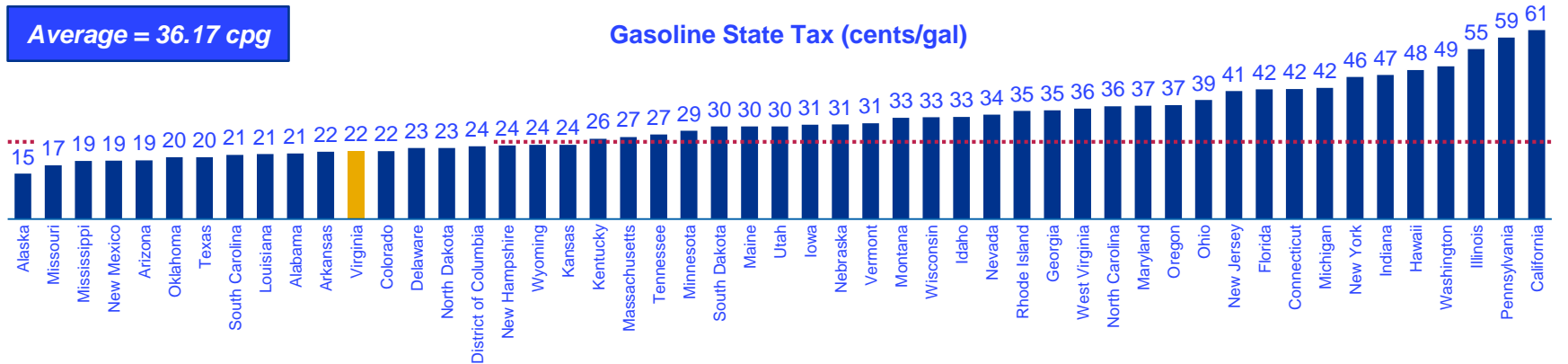
Average = 106 Million

Daily Vehicle Miles Traveled (in Millions of Miles)



Source: FHWA – 2017 data

Motor Fuels "Full" Tax Rates by State



Note: Average represents approximate volume-weighting
 Source: API - State Motor Fuel Tax Rates (effective as of 7/1/2019)

Funding Options (1 of 2)

Truck & Freight	Overweight Registration	<i>Registration based on vehicle weight and resultant impact on roadway; can be integrated into a VMT or other usage-based program</i>
	Weight-mile Tax	<i>VMT-based implementation of the program detailed above</i>
	Diesel Heavy Duty Fee	<i>VMT-based implementation of the program above, focused on diesel</i>
Other Mechanisms	Tire Tax	<i>Tax on sales of light-duty vehicle tires</i>
	Rental Car Tax	<i>Tax on rental cars</i>
	Hotel Occupancy Tax	<i>Tax on hotel occupancy (often referred to or integrated with a "tourism tax")</i>
	Vanity Plate Fees	<i>Fee for getting a personalized license plate for a vehicle</i>
	Container Tax	<i>Fee related to the handling and movement of large containers; typically discussed as funds earmarked for freight and port investment</i>
	Inspection Fees	<i>Fee to inspect vehicle for basic safety and/or environmental compliance</i>
	Drivers License Surcharge	<i>Fee for administering and providing drivers licenses to vehicle operators</i>
	Harbor Maintenance Tax	<i>Similar to customs duties and fees; would tax passenger tickets and some classifications of commercial cargo</i>
	Income Tax Fees	<i>Ring-fenced portion of income or payroll tax dedicated to transportation</i>
	Vehicle Age Fee	<i>Variable fee contingent on vehicle model year from date of annual registration</i>

Funding Options (2 of 2)

Consumption	Fuel Sales Tax	<i>Percentage-based tax on sales of motor fuels</i>
	Fuel Excise Tax	<i>Volume-based tax on sale of motor fuels</i>
	Road Pricing/Tolls	<i>Based on use of designated road segments</i>
VMT-based	Road User Charges	<i>Also referred to as VMT or MBUF; a distance-based usage charge</i>
	VMT Emissions	<i>Add-on fee for CNG/LPG vehicles</i>
	Real-time Electronic Charges	<i>Checkpoint-based charges, similar to tolling</i>
Emerging Businesses + Modes	Electric Vehicle / High Efficiency Fees	<i>Registration fee for low/no gasoline-usage vehicles</i>
	Alternative Fuel Decal Fee	<i>Fee for alternative fuel vehicles to access public charging, etc.</i>
	Ride-hailing / Carsharing Fees	<i>Fees for on-demand transportation such as Uber or Lyft</i>
	Home Rental Fees	<i>Fee for utilizing services such as VRBO or Airbnb</i>
	E-commerce Fees	<i>Fee for services generating deliveries (e.g., Amazon) or with similar approaches to historical business types (e.g., Travelocity)</i>
	Bicycle Fees	<i>Fee for purchase or registration of bicycles or similar vehicles</i>
Value Capture	Assessment / Development Fees	<i>Special charges on properties/parcels in close vicinity to newly improved transportation or other agency-owned assets</i>
	Retail Sales Tax	<i>Dedicated transportation portion of retail sales tax on goods</i>
	Vehicles Sales/Transfer Tax	<i>Tax on new vehicle sales or title transfers</i>
	Minerals-Related	<i>Taxes on mineral and natural resource related products, such as oil and gas production or import</i>
	Destination Fees	<i>Fees related to designated destinations (parks, beaches, etc.) that drive significant vehicle mileage</i>

Funding Context

Illustrative Selection

	Motor Fuels	Tourism	Natural Resources	HOT / Tolls	Vehicle Fees	General Sales	Other
Virginia	X			X	X	X	
Arkansas	X		X		X	X	<i>Natural gas severance</i>
Colorado	X			X	X		<i>Rental vehicles</i>
Florida	X				X		<i>Aviation fuels, rental cars</i>
Georgia	X	X					<i>Hotel taxes</i>
Kansas	X			X	X	X	<i>Property sales</i>
Maine	X				X		<i>Liquor distribution</i>
Maryland	X		X		X		<i>Corporate income taxes</i>
Massachusetts	X	X		X	X		<i>Gaming Revenues</i>
North Carolina	X				X		<i>Title/ vehicle transfer (3%)</i>
South Carolina	X			X			<i>Title/ vehicle transfer (5%)</i>
Texas	X		X	X	X		<i>Lubricants tax, oil & gas</i>
Utah	X			X	X	X	<i>General Retail Tax</i>

Source: BATIC/AASHTO "50 States Report"; state published information

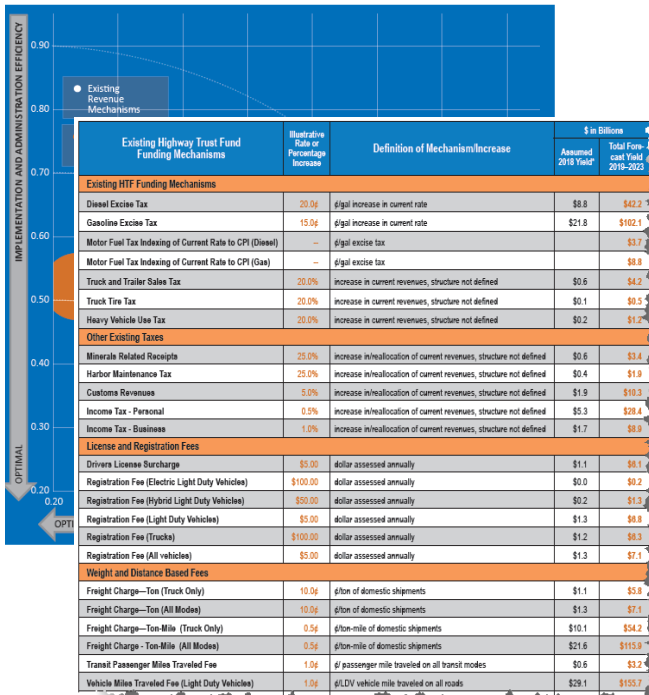
What about who pays now?

Revenue Source	Virginians	Out-of-State Users	Percentage of CTF Revenues
Gasoline Tax	Yes (~83%)*	Yes (~17%)	24.8%
Diesel Tax	Yes (~49%)*	Yes (~51%)	
Vehicle sales	Yes	No	27.4%
Retail sales	Yes (80%+)	Yes (> 20%)	30.3%
Registration fee	Yes	No	7.6%
IRP	Yes	Yes	1.9%
Insurance Prem.	Yes	No	4.9%
Misc.	Yes	No	3.1%

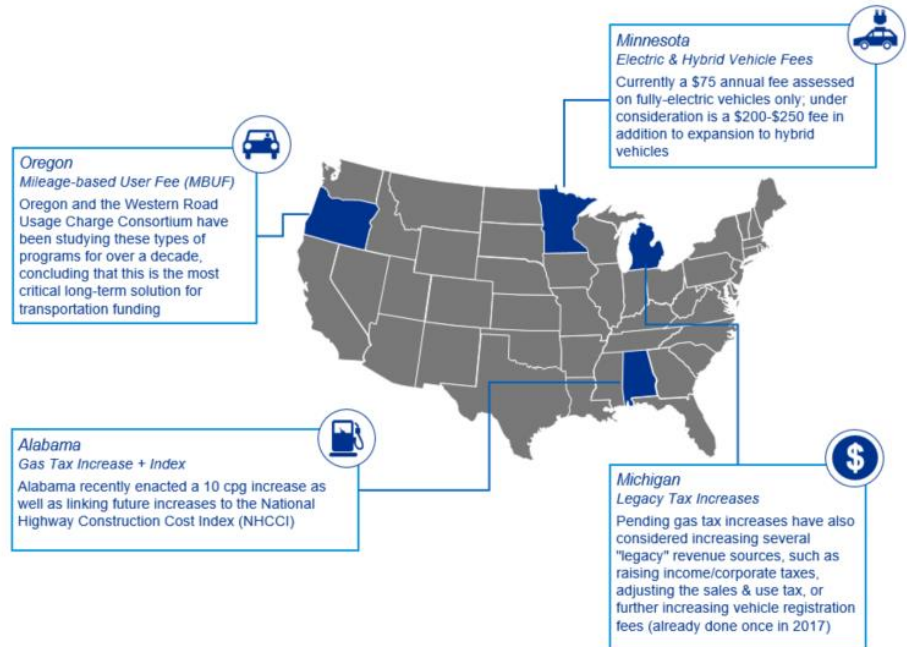
* Based on estimate

Developing a Catalog of Funding Options

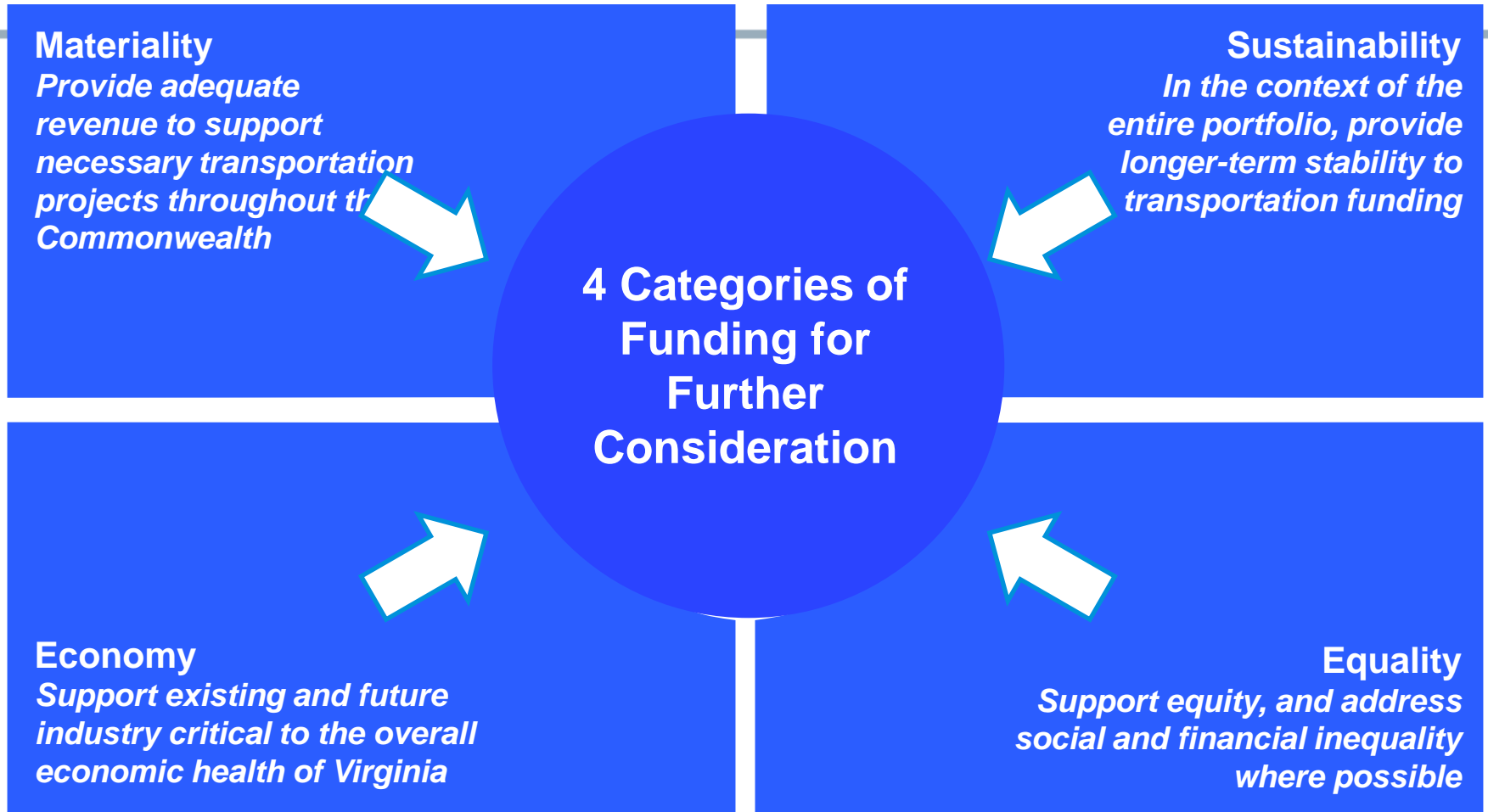
AASHTO Transportation Revenue Options (2019)



Review of Measures Other States Are Considering



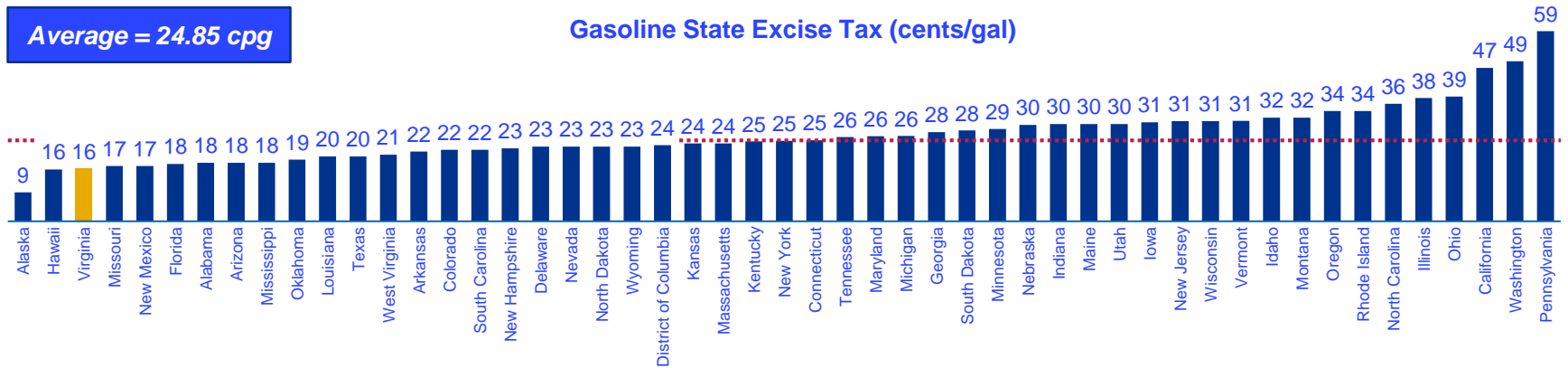
Design Principles



Motor Fuels Excise Tax by State

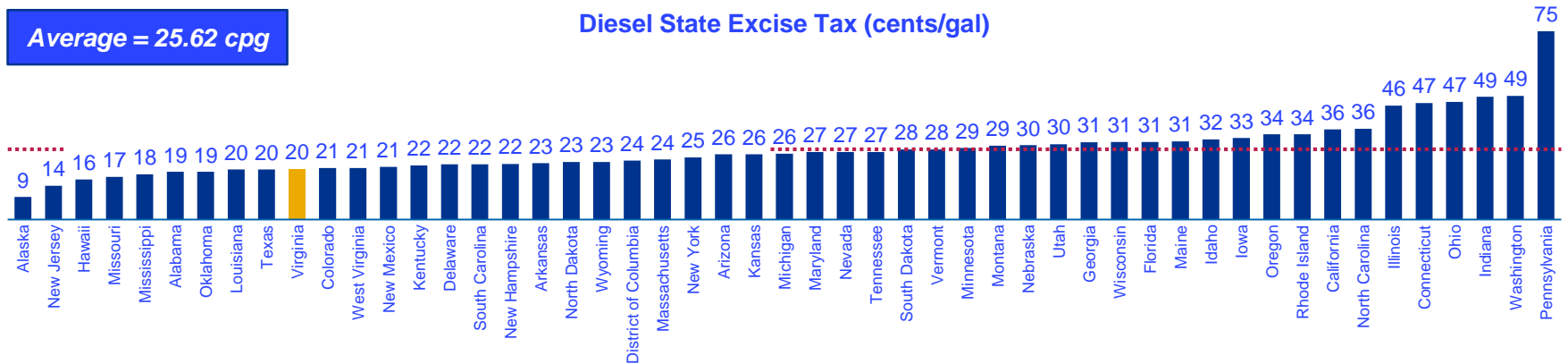
Average = 24.85 cpg

Gasoline State Excise Tax (cents/gal)



Average = 25.62 cpg

Diesel State Excise Tax (cents/gal)

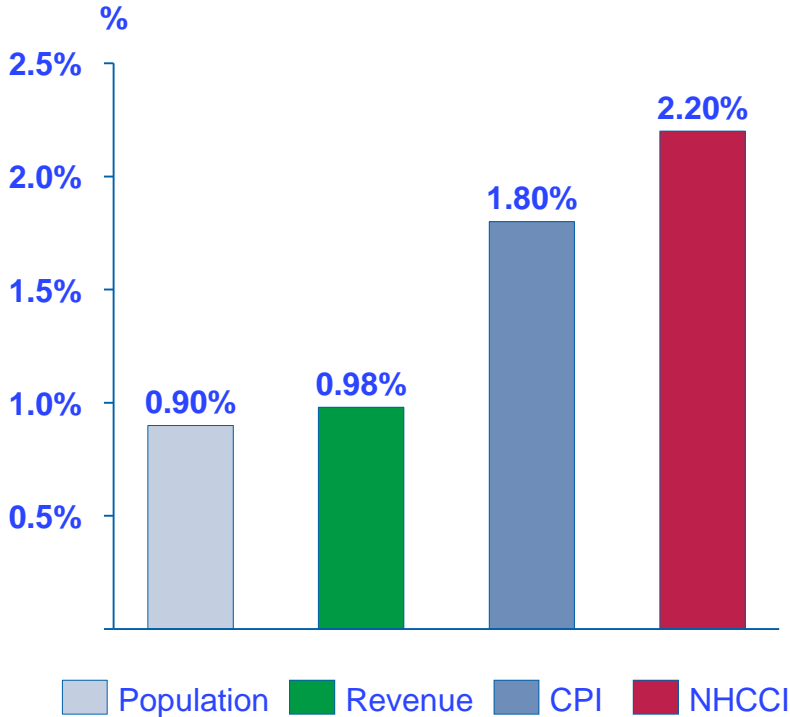


Note: Average represents approximate volume-weighting

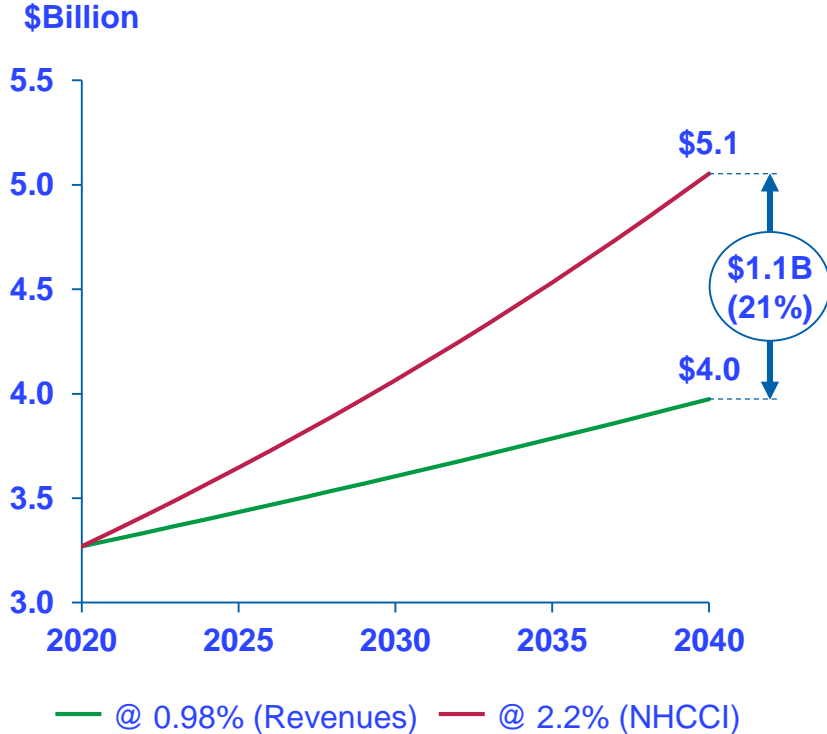
Source: API - State Motor Fuel Tax Rates (effective as of 7/1/2019)

Comparison to Expenditure Growth Rates

Forecasted Revenue vs. 10-Yr Historical Growth Indices^(a)



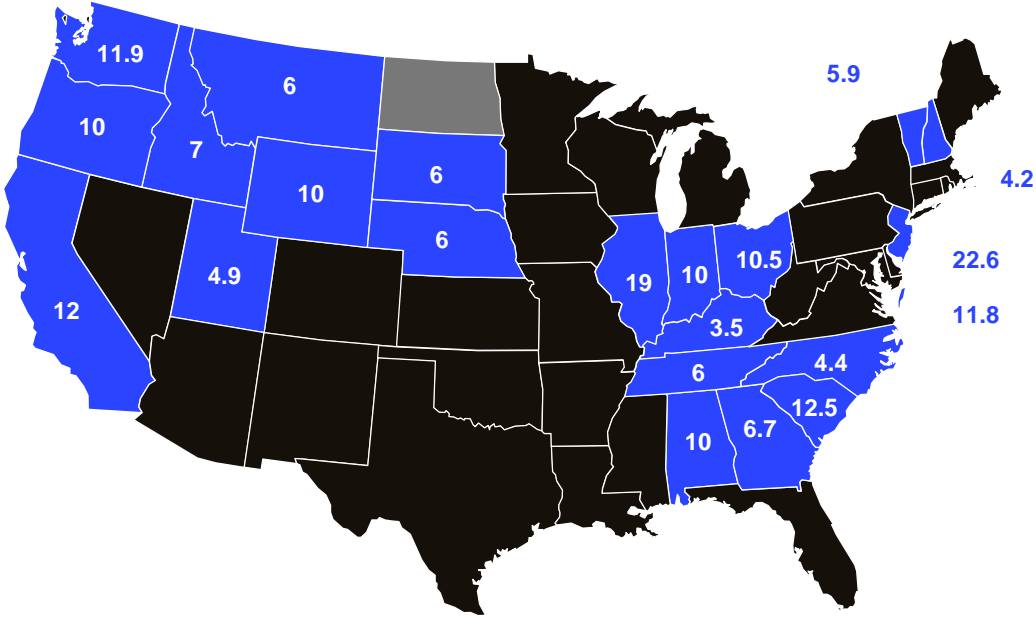
Notional Growth Rate Over time



Note(s): (a) All indices are CAGRs
 Source(s): VDOT; Federal Highway Administration; Bureau of Labor Statistics; Statista; KPMG Analysis

Recent Motor Fuels Tax Increases

Major Increases in Motor Fuel Taxes Since 2013



Average increase since 2013 has been approximately 10

Note: Includes only states with significant increases enabled by discrete legislative measures
 Source: National Conference of State Legislatures

States with Variable Fuel Taxes

Inflation-based Index		
State	Gas Tax + Fees (cpg)	Index Type
Alabama	21.21	National Hwy Construction Cost Index
California	55.18	State Inflation Rate
Florida	37.99	Consumer Price Index (CPI)
Georgia	35.28	Vehicle Fuel Efficiency and CPI
Indiana	42.90	State Inflation Rate
Maryland	35.30	Gasoline Prices and CPI
Michigan	42.86	State Inflation Rate
North Carolina	36.45	Population Growth and CPI
Rhode Island	34.00	Consumer Price Index
Utah	30.01	Gasoline Prices and CPI

Price or Spend-based Index		
State	Gas Tax + Fees (cpg)	Index Type
Arkansas	21.80	Gas Prices
Connecticut	36.85	Gas Prices
Hawaii	46.76	General Sales Tax
Illinois	36.87	General Sales Tax
Kentucky	26.00	Gasoline Prices
Nebraska	30.50	Gas Prices and State Spending
New Jersey	41.40	Gas Prices / Revenue Collection
New York	45.35	Gas Prices
Pennsylvania	58.70	Gas Prices
Vermont	30.46	Gas Prices
Virginia	21.95	Gas Prices
West Virginia	35.70	Gas Prices

Source(s): National Conference of State Legislatures and American Petroleum Institute Estimates as of 7/1/19

Current and Proposed Efforts with Transportation Network Companies

Fee on Total Trip Cost

Entity	Type	Amount
Alabama	Variable	1%
District of Columbia	Variable	6%
Nevada	Variable	3%
Rhode Island	Variable	7%
South Carolina	Variable	1%
South Dakota	Variable	4.5%
Wyoming	Variable	4%

Per-ride Fees

Entity	Type	Amount
Chicago	Fixed	\$0.72 / ride
Connecticut	Fixed	\$0.25 / ride
Maryland	Fixed	\$0.25 / ride
Massachusetts	Fixed	\$0.20 / ride
New Orleans	Fixed	\$0.50 / ride
New York (Manhattan)	Fixed	\$2.75 / ride
Portland	Fixed	\$0.50 / ride
Seattle	Fixed	\$0.24 / ride

Annual TNC Direct Fee

Entity	Type	Amount
Arkansas	Fixed	\$15,000 / year
Colorado	Fixed	\$111,250 / year
Kentucky	Variable	\$280 / vehicle

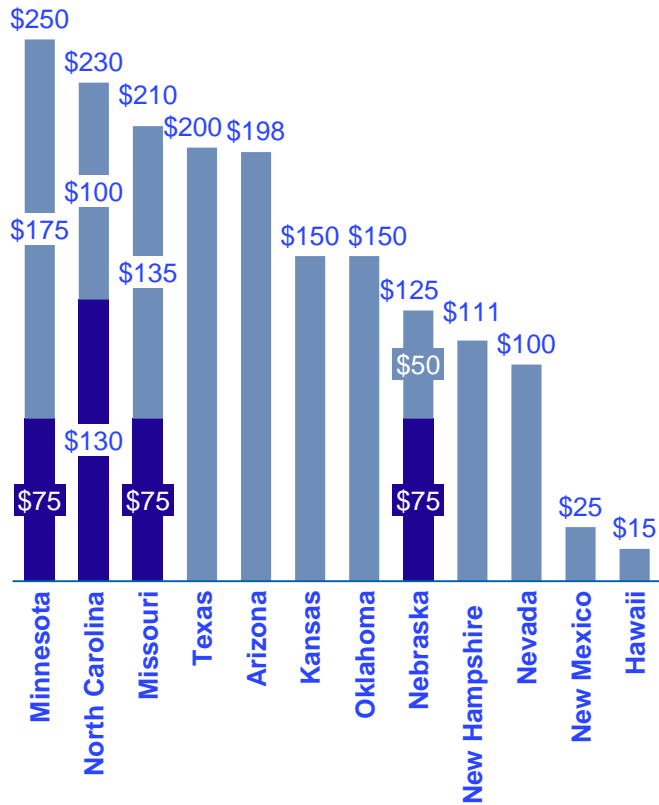
Proposed/Pending

Entity	Type	Amount
Georgia	Variable	7-9%
Los Angeles	Variable	3.25%
Pennsylvania	Fixed	\$1.00 / ride
San Francisco	Variable	3.25%

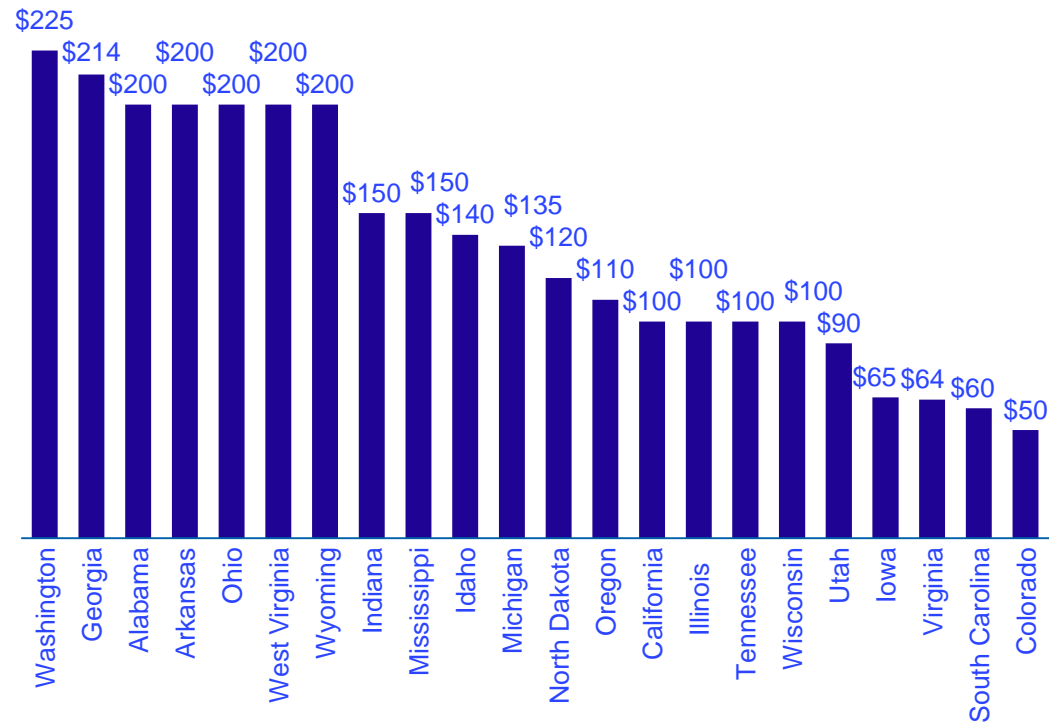
Source(s): Websearches; TNC Policy Guide – State of Washington, 2019

Current & Proposed Electric Vehicle Registration Fees

States w/ Existing and/or Proposed Fees



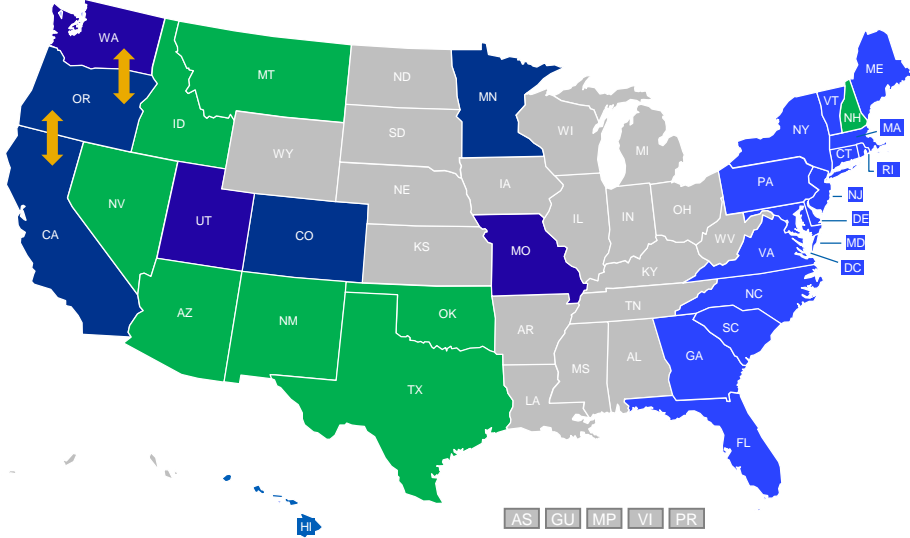
States w/ Fees in Place (No Active Changes Proposed)



■ Proposed ■ Existing

Source(s): NCSL; Consumer Reports EV Fee Analysis

Status of VMT-based Fee Programs



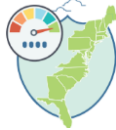
- Completed Pilot
- Monitoring Issue
- Planning Pilot
- Interoperability Pilots



Launched in 2015, Oregon fielded a voluntary program for up to 5,000 participants that has fewer than 1,000 active vehicles today



Colorado ran a successful but extremely limited (~100 volunteers) test beginning in the Fall of 2016



The I-95 Corridor Coalition is currently in the midst of an ambitious, multi-phase pilot for both personal vehicles and trucks / motor carriers



California's road charge project recruited more volunteers than initially scoped in 2017/18, but will likely see limited immediate follow-on due to the passage of SB1 (gas tax increase)



Utah's upcoming road charge pilot will focus first on alternative fuel vehicles, with an annual cap of \$120 on the total fees per vehicle

Utah | *Road Usage Program*

Program Description	<i>In January 2020, UDOT will launch a voluntary road usage charge program for all alternative fuel vehicles</i>
Participants	<i>All alternative fuel vehicle (EV, PHEV, and gas hybrid) owners are eligible representing approximately 2% of statewide vehicle fleet or approximately 45,000 vehicles</i>
Data Collection	<i>(1) OBD-II GPS Plug-in device (2) Smart-phone based odometer reading</i>
Fee Rate(s)	<i>A per-mile fee at a rate to be determined; total annual fees capped at the amount of annual vehicle fee (\$120 indexed to CPI for electric vehicles)</i>
Status & Next Steps	<i>UDOT intends to initiate the program in January 2020 as directed in SB 136 passed in 2018</i>
Key Learnings	<ul style="list-style-type: none"> ▪ <i>Providing citizens with choices was a key design element</i> ▪ <i>Initial program may be scaled to include additional functionality (e.g., out-of-state travel) or additional vehicle types</i> ▪ <i>People with privacy concerns may opt for limited data retention or simply pay the fixed annual fee</i>





COMMONWEALTH of VIRGINIA
Office of the
SECRETARY of TRANSPORTATION

Thank you.

