



## COMMONWEALTH of VIRGINIA

### *Commonwealth Transportation Board*

Shannon Valentine  
Chairperson

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Richmond, Virginia 23219

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## **COMMONWEALTH TRANSPORTATION BOARD WORKSHOP AGENDA**

Executive Conference Center  
Suite 200  
2345 Crystal Drive  
Arlington, Virginia 22202  
November 20, 2019  
12:30 p.m.

1. I-81 Update  
*Nick Donohue, Deputy Secretary of Transportation*
2. Comprehensive Review Special Structures  
*Stephen Brich, Virginia Department of Transportation*
3. Director's Items  
*Jennifer Mitchell, Virginia Department of Rail and Public Transportation*
4. Commissioner's Items  
*Stephen Brich, Virginia Department of Transportation*
5. Secretary's Items  
*Shannon Valentine, Secretary of Transportation*

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COMMONWEALTH of VIRGINIA

Office of the

SECRETARY of TRANSPORTATION

# Interstate 81 Corridor Improvement Program and Fund Update

Nick Donohue

Deputy Secretary of Transportation

December 2019



# 2019 Acts of Assembly



- **Chapters 837 and 846- CTB Report Requirements**
- **Report by December 15 to General Assembly**
  - Performance of the I-81 corridor
  - Effectiveness of operational strategies and capital improvements
  - Status of projects
  - Current and projected I-81 Fund balances
- **Annual program allocation**
- **Financing plan**
- **Schedule of projects and strategies**

# Performance Measures- Baseline



## Safety and Performance of I-81, including:

- **Crash frequency and severity**
- **Person hours of delay**
- **Number of incidents involving lane closures**
- **Average duration of incidents involving lane closures**

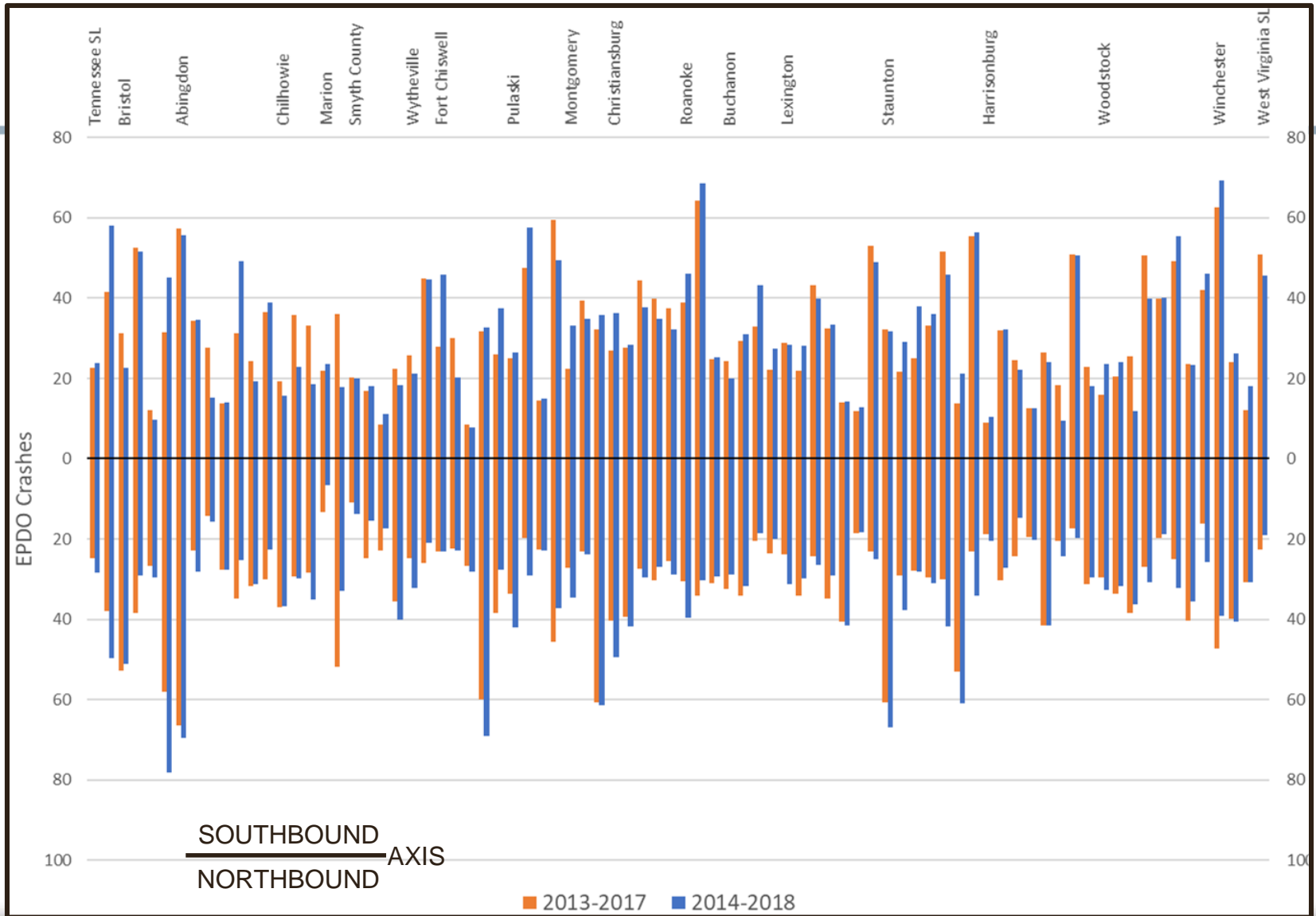
# Performance Measures- Baseline Comparison

## Comparison of I-81 Corridor Improvement Plan measures

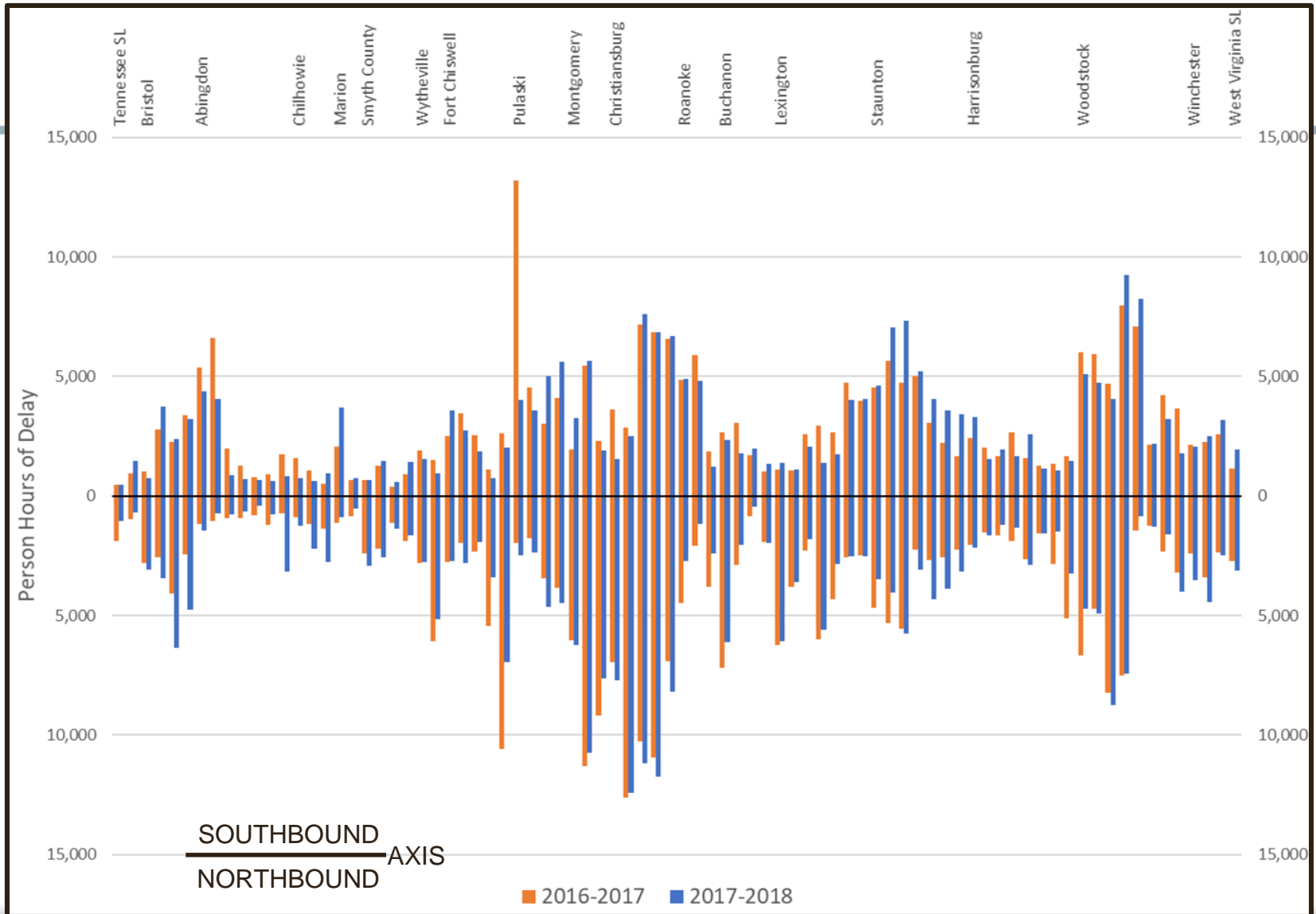
- 2013-2017 to 2014-2018 for crash measure and
- 2016-2017 to 2017-2018 for delay, lane impacting incidents, and total hours lane closures measures

Performance Measure	I-81 Corridor-wide % Change
EPDO Totals Per Mile	2.3% increase
Person-Hours of Delay	5.0% decrease
Lane-Impacting Incidents	16.0% increase
Total Hours of Lane Closures	20.0% increase

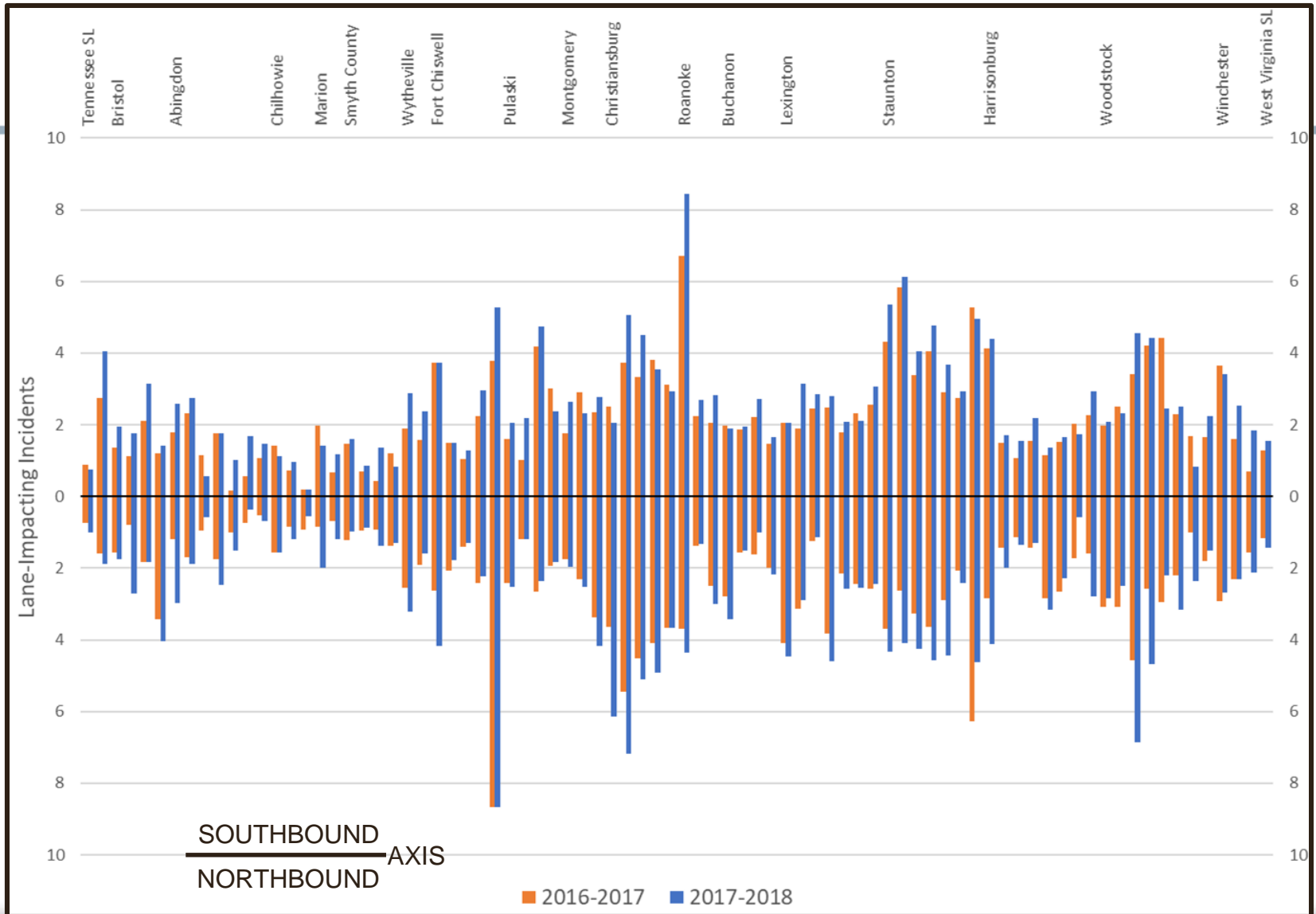
# Performance Measures- EPDO Crashes per Mile



# Performance Measures- Person-Hours of Delay

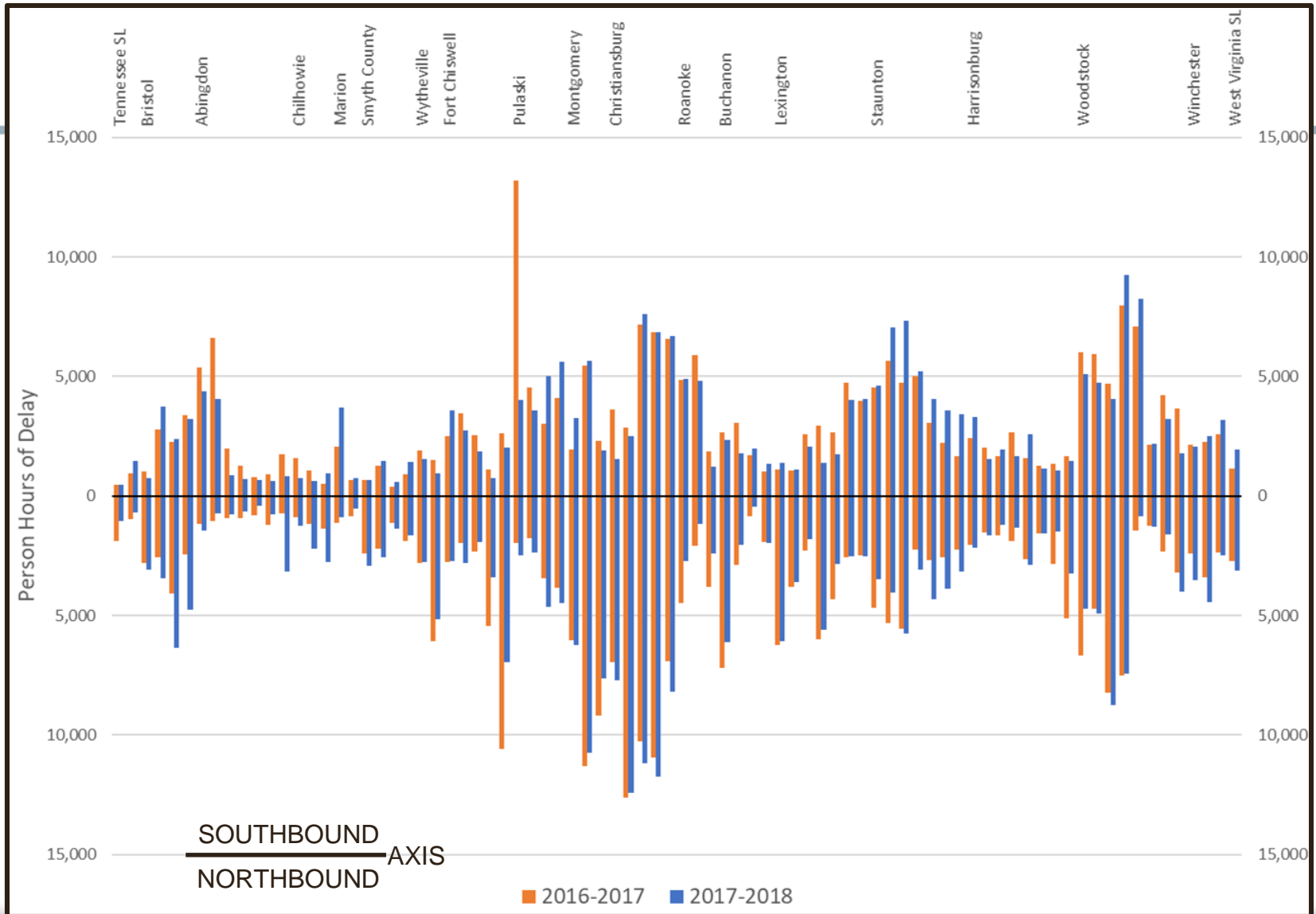


# Performance Measures- Lane-Impacting Incidents





# Performance Measures- Average Incident Duration



# Assessment of Strategies



- **2019 is the first year of implementation of operational and capital improvements**
  - **July 2019: Safety Service Patrol expansion**
  - **Fall 2019: Curve improvement installations (flashing chevrons)- multiple locations**
  - **Fall 2019: Camera installations- multiple locations**
  - **Fall 2019/Spring 2020: CMS installations- multiple locations**
- **Study team will rely on a minimum of one year of data following the implementation of the program or project**
- **Results to be reported in 2020**

# Program Schedule

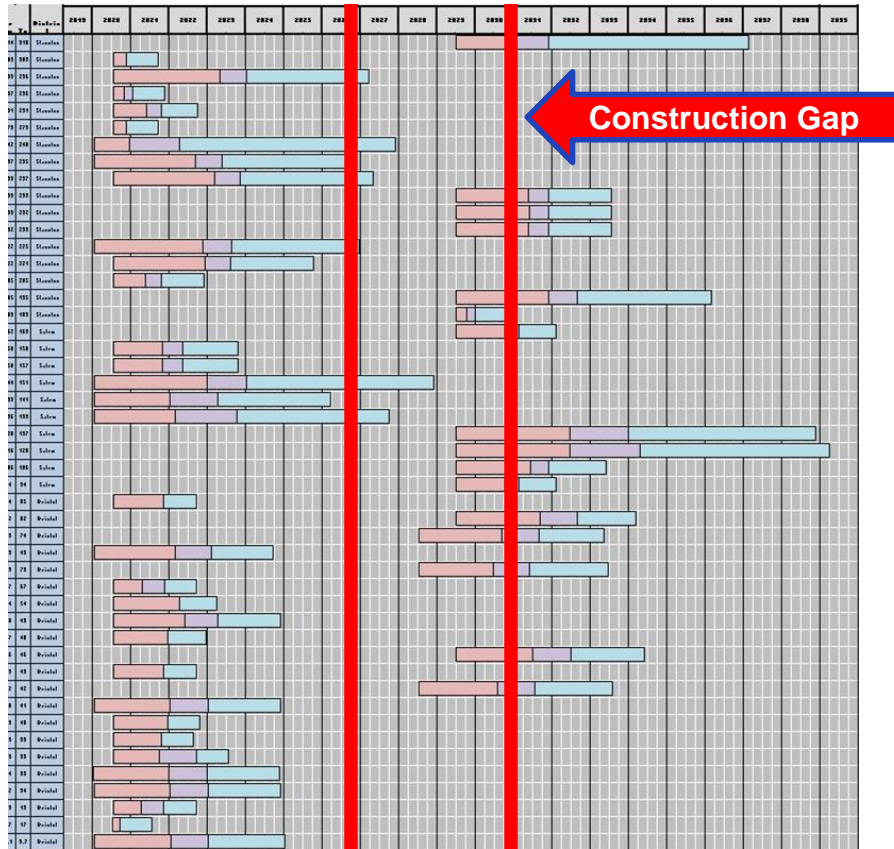


- **16 projects included in initial FY2020-2025 SYIP**
- **31 projects amended into FY2020-2025 SYIP in October**
- **Currently assumes a Pay-Go financing scenario**
- **Remaining 17 projects to be added in 2028/2029 under Pay-Go**

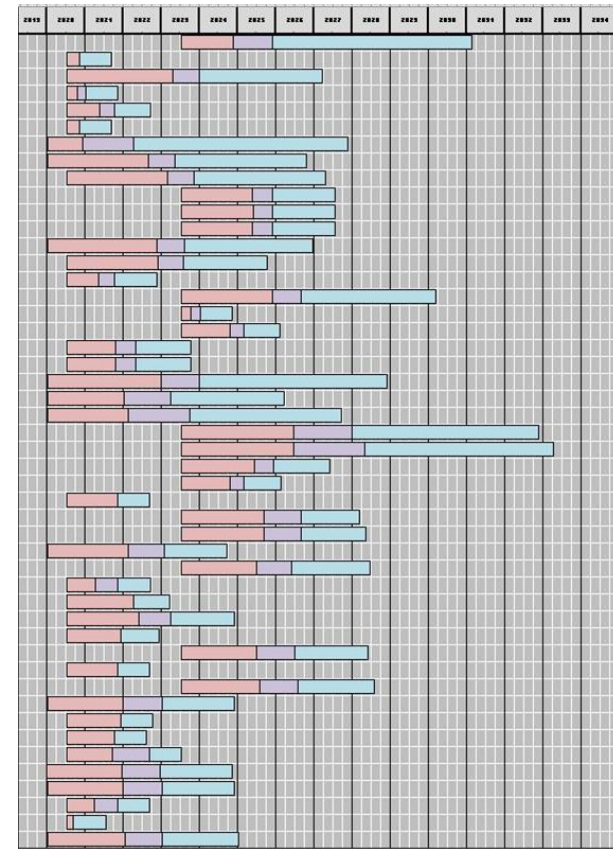


# Program Schedule

## Pay-Go Schedule



## Bonding/TIFIA Schedule



# Annual Program Allocations and Financing Plan



	Current	FY21	FY22	FY23	FY24	FY25	FY26	Total
Total Available	103.5	132.0	162.1	163.4	161.9	163.4	163.4	1,049.7
Total Programmed	103.5	122.4	152.5	153.8	161.7	163.2	0	857.1
Total Remaining	0	9.6	9.6	9.6	0.2	0.2	163.4	192.6

- Reflects allocations in FY2020-2025 Six-Year Improvement Program as of December 1, 2019
- Incorporates October Board amendment to add 31 projects from I-81 Plan
- Assumes Pay-Go financing
- Should GA approve bonding, remaining 17 projects in out years can be accelerated

# Takeaway Scorecard



Activity	Status	Anticipated Completion
Safety Service Patrol	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, ~21 years for delivery Under Bonding Scenario, ~12 years for delivery



## Interstate 81 Corridor Improvement Plan

### What's Happening

The Commonwealth Transportation Board (CTB), with assistance from the Office of Intermodal Planning and Investment, the Virginia Department of Transportation (VDOT) and the Department of Rail and Public Transportation (DRPT), studied the entire length of the Interstate 81 corridor in the Commonwealth of Virginia in 2018.

The CTB **approved** the I-81 Corridor Improvement Plan on Dec. 5, 2018 and the study's findings were reported to the General Assembly. The study identified a \$2 billion package of projects for the corridor.

During the 2019 General Assembly, two bills were introduced regarding the Interstate 81 Corridor Improvement Plan, Senate Bill **1716** and House Bill **2718**. The bills did not identify dedicated revenue sources for funding the project package. On March 28, 2019, Governor Northam **announced amendments** to the bills, which would provide for dedicated funding sources for projects identified as priorities. The amendments were passed by the General Assembly and signed by Governor Northam on April 3, 2019, now establishing the 2019 Acts

**Localities:** Augusta, Botetourt, City of Bristol, Frederick, City of Harrisonburg, Montgomery, Pulaski, Roanoke, City of Roanoke, Rockbridge, Rockingham, City of Salem, Shenandoah, Smyth, City of Staunton, Washington, City of Winchester and Wythe counties

**Districts:** Bristol, Salem, and Staunton





# COMPREHENSIVE REVIEW SPECIAL STRUCTURES

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

November 20<sup>th</sup>, 2019

# Special Structures - Introduction

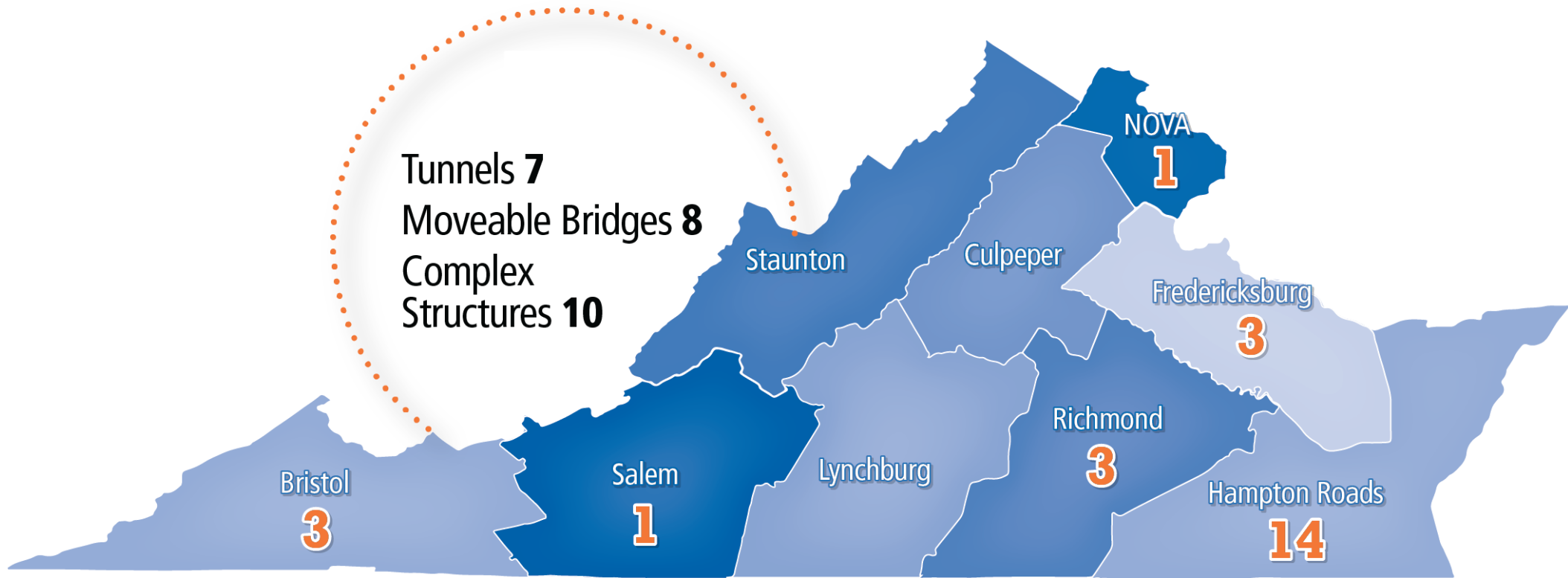
## 2018 Report to General Assembly



## 2019 Developed a Statewide, Systematic Long-Term Plan

- Looks ahead 50 years and includes operations
  - Critical to ensuring mobility
- Based on consistent classification and life-cycle approach
- Based on several workshops (Districts/ Facility Managers/ Central Office)
- Will be a living document that will be maintained and updated annually
- Presented today to inform you of important economic and budget considerations

# Special Structures – Inventory



## Defined By:

- Risk/Complexity
  - Maintenance Cost
  - Importance
- Long Detours, High Traffic, Economic Significance (Shipping and Vehicular), Access to Vital Facilities (Military and Ports)

# Special Structures – Original Build

George P. Coleman Memorial Bridge



Berkley Bridge



Hampton Roads Bridge-Tunnel



# Special Structures – Current State

## Managed by Public Private Partnership

- Pocahontas Parkway (Rt 895): through 2105
- Elizabeth River Tunnel (Midtown): through 2069
- Elizabeth River Tunnel (Downtown): through 2069
- Required funding not included in plan
- VDOT responsible for the facility costs (e.g. maintenance, operations and replacement) once the concession agreement ends

## Hampton Roads Bridge-Tunnel Project

- HRBT Approaches
- I-64 over Willoughby
- Existing tunnel - not included in HRBT project
  - Required funding included in Long-Term Plan being presented today
- VDOT responsible for new tunnel maintenance and operations once construction is complete
  - Required funding included in Long-Term Plan being presented today

# Special Structures - Tunnels

## Mountain Tunnels

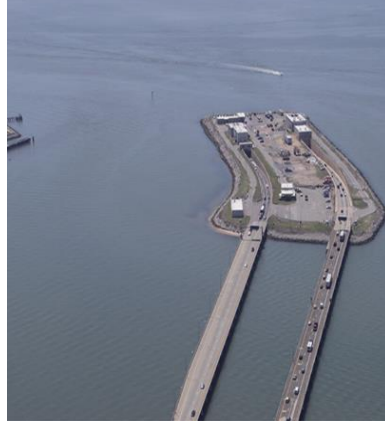
Big Walker Mountain Tunnel



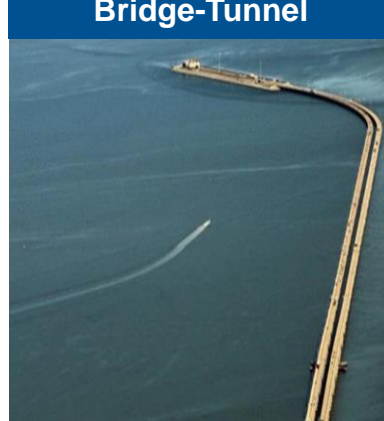
East River Mountain Tunnel



Hampton Roads Bridge-Tunnel



Monitor-Merrimac Memorial Bridge-Tunnel



Elizabeth River Tunnel (Midtown)



Elizabeth River Tunnel (Downtown)



## Gateway Park / Rosslyn Tunnel

3 Highway bridges, 7 Pedestrian bridges, 2 In-fill (deck or park) structure



Gateway Park



Rosslyn Tunnel



# Special Structures - Movable Bridges

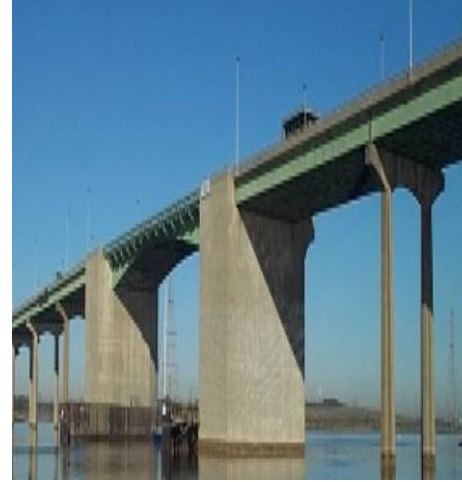
**Benjamin Harrison Memorial Bridge**



**John B. Whealton Memorial Causeway Bridge (Chincoteague)**



**High Rise Bridge**



**Berkeley Bridge**



**George P. Coleman Memorial Bridge**



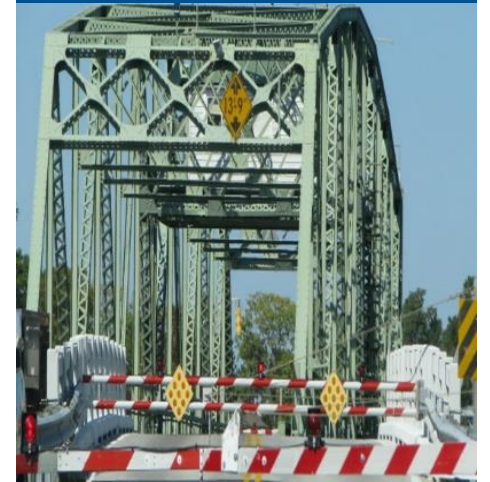
**James River Bridge**



**Eltham Bridge**



**Gwynn's Island Bridge**



# Special Structures - Complex Structures

Grassy Creek Bridge  
(460 Connector)



Gordon C. Willis  
SMART Road Bridge



Varina-Enon Bridge



Pocahontas Parkway



Hampton Road  
Bridge-Tunnel  
(Willoughby Bay)



Hampton Roads  
Bridge-Tunnel  
Approach Bridges



Monitor-Merrimac Memorial  
Bridge-Tunnel  
Approach Bridges



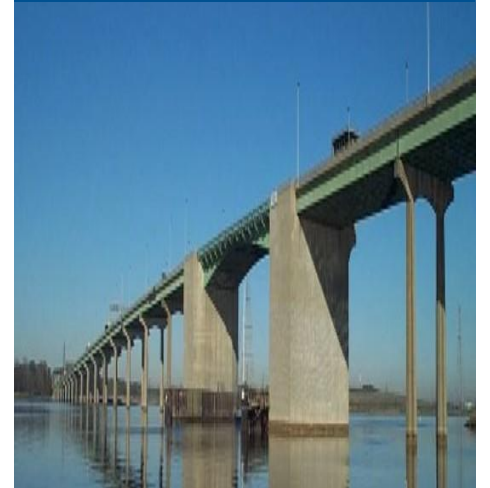
James River Bridge



Robert O. Norris Bridge



High Rise Bridge





# Special Structures – 2019 Long-Term Plan

## Statewide Special Structures Long-Term Plan (50 years)

- **Developed including each VDOT maintained and operated Special Structure**
- **Consistent terminology established along with a life-cycle approach**
  - **Work Types**
    - Structure replacement – Complete replacement of the structure
    - Component replacement – Replacement of parts (e.g., deck, generator)
    - Maintenance – Activities that sustain or improve the condition of structural components
    - Operations – Day to day requirements to keep the facility operating (labor, daily utilities (power/water), materials, equipment)
  - **Work Categories**
    - Component, part or activity (electrical, structural, hydraulic, utilities)

# Monitor-Merrimac Memorial Bridge-Tunnel Tunnel Long-Term Plan

50 Year Plan

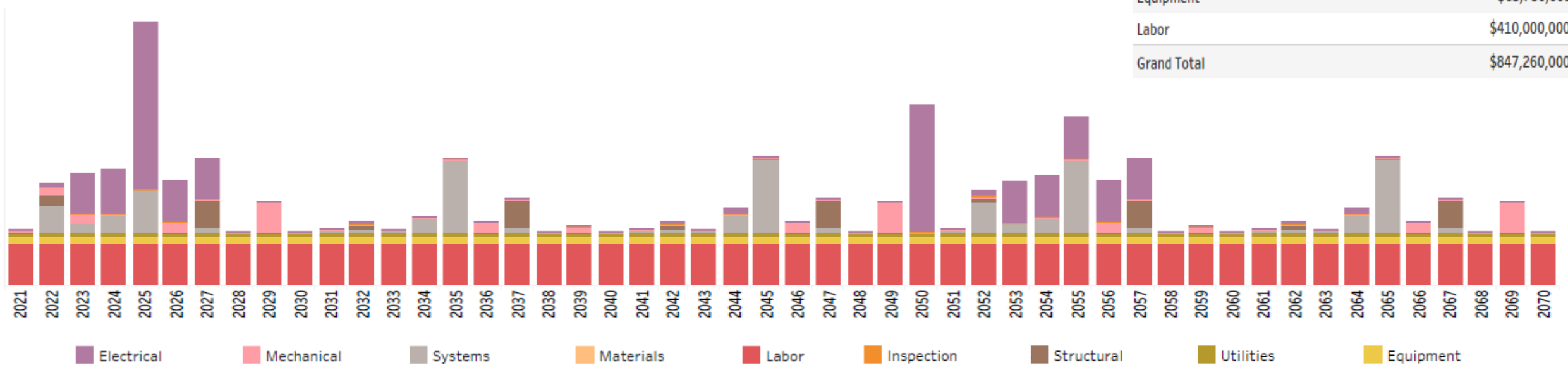
Average:  
\$17M/Year

\*All amounts in 2019 dollars

Category	
Tunnel	\$847,260,000
Grand Total	\$847,260,000

Work Type	
Component Replacement	\$275,010,000
Maintenance	\$48,500,000
Operations	\$523,750,000
Grand Total	\$847,260,000

Work Category	
Electrical	\$135,580,000
Inspection	\$12,000,000
Mechanical	\$33,500,000
Structural	\$34,380,000
Systems	\$108,050,000
Utilities	\$35,000,000
Materials	\$15,000,000
Equipment	\$63,750,000
Labor	\$410,000,000
Grand Total	\$847,260,000



# Monitor-Merrimac Memorial Bridge-Tunnel

## Tunnel Long-Term Plan

### Work Examples

#### Work Category - Electrical

- **Utility power, switchgear and generator**  
Life-cycle 30 years, \$40.5M per replacement  
(\$81M over 50 years)
- **Tunnel lighting**  
Life-cycle 25 years, \$25M per replacement  
(\$50M over 50 years)

#### Work Category - Labor

- **Maintenance and operations staffing**  
VDOT and contractor, \$8.2M per year,  
(\$410M over 50 years)

#### Work Category - Inspection

- **National Tunnel Inspection Standards(NTIS) and other Inspections**  
Annual activity, \$0.24M per year  
(\$12M over 50 years)



Tunnel Lighting



Control Room

# Special Structures – Cost Estimate Changes since 2018

\*All amounts in 2019 dollars

## Special Structure Report 2018

<b>30 Year Estimates</b> (Structure Replacements \$1,265M, Major Repairs \$2,363M)	<b>\$3,628M (\$121M/Year)</b>
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## Special Structures Plan 2019 – Comprehensive Review

<b>50 Year Long-Term Plan</b>	<b>\$8,121M (\$162M/Year)</b>
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Update of Major Repairs life-cycle approach over 50 Years	\$3,899M
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2019 Estimate Update Replacements *Replacements (compared to \$1,265M in 2018 Report)	+\$917M
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<b>Subtotal (\$97M/Year) comparing same work items from 2018 and 2019</b>	<b>\$4,816M</b>
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### Additional Items:

Operations (Labor, equipment, materials, utilities) includes \$437M for new HRBT	\$2,470M
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Routine Maintenance (Inspection, annual repairs, washing, lubrication on movables) Includes \$240M for new HRBT	+751M
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Maintenance on movable approaches (fixed portions, where approaches not included in complex list)	+\$84M
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<b>Subtotal (\$65M/Year)</b>	<b>\$3,305M</b>
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<b>Total 2019 50 Year Plan = \$4,816M + \$3,305M</b>	<b>\$8,121M (\$162M/Year)</b>
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# Special Structures – Long-Term Plan (50 Years)

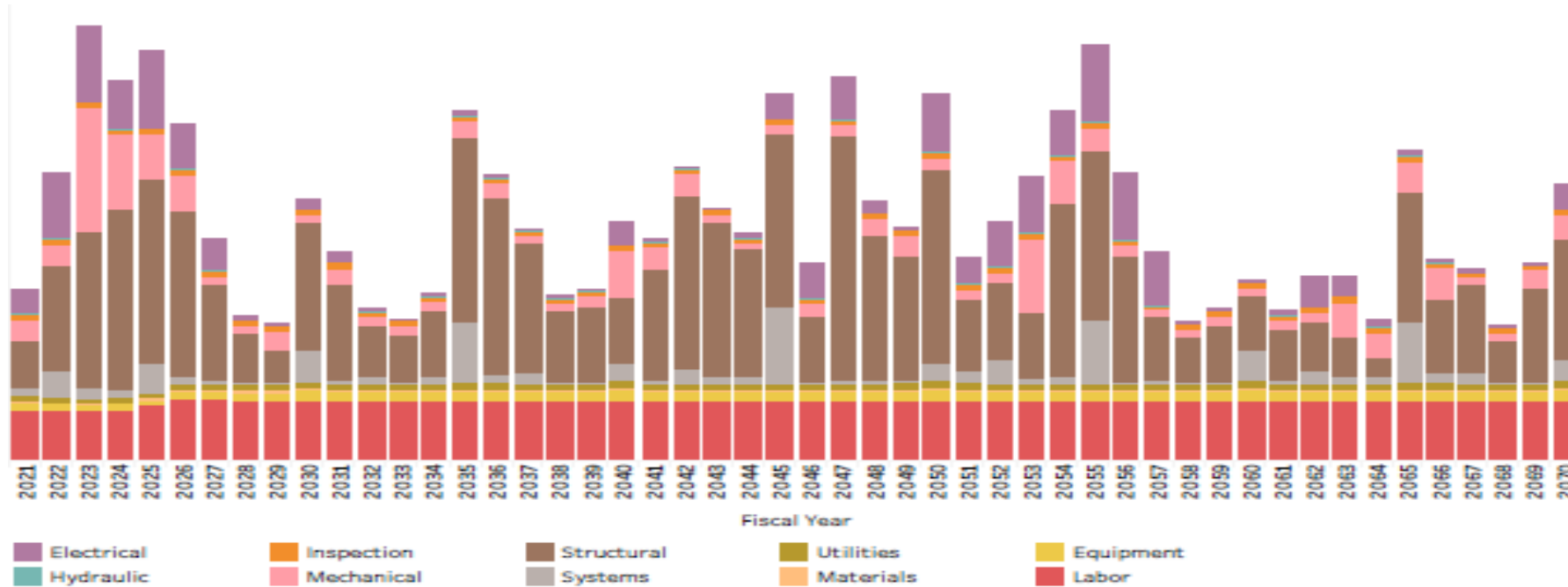
\*All amounts in 2019 dollars

Category	
Tunnel	\$3,744,166,000
Movable Bridge	\$1,858,414,500
Complex Structure	\$2,518,850,000
<b>Grand Total</b>	<b>\$8,121,430,500</b>

Work Type	
Structure Replacement	\$917,500,000
Component Replacement	\$2,114,303,000
Maintenance	\$2,619,700,500
Operations	\$2,469,927,000
<b>Grand Total</b>	<b>\$8,121,430,500</b>

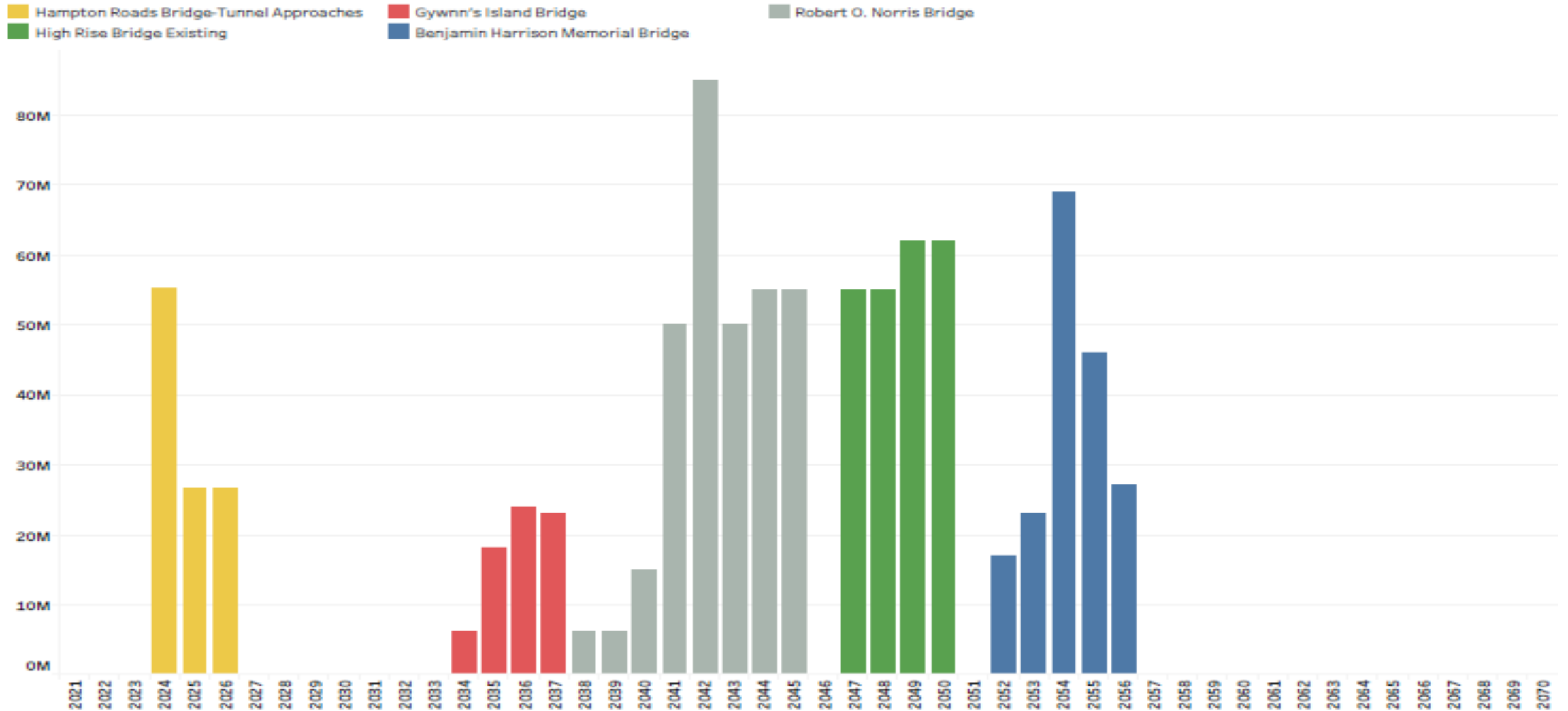
Work Category	
Electrical	\$704,115,500
Hydraulic	\$625,000
Inspection	\$200,878,000
Mechanical	\$706,804,000
Structural	\$3,505,749,000
Systems	\$439,074,000
Utilities	\$228,935,000
Materials	\$71,100,000
Equipment	\$250,225,000
Labor	\$2,013,925,000
<b>Grand Total</b>	<b>\$8,121,430,500</b>

Special Structure	
Rosslyn	\$84,721,000
Big Walker	\$498,040,000
East River	\$531,625,000
HRBT - old	\$1,068,830,000
HRBT - new	\$713,690,000
MMMBT	\$847,260,000
James River Bridge	\$257,700,000
High Rise	\$72,712,000
Gwynn's Island	\$125,295,000
Eltham	\$181,375,000
Coleman	\$354,338,000
Chincoteague	\$120,212,500
Berkley	\$369,455,000
Benjamin Harrison	\$377,327,000
Willoughby Bay	\$180,920,000
Varina-Enon	\$193,850,000
Smart Road Bridge	\$13,670,000
Norris	\$476,370,000
MMMBT - Approaches	\$692,380,000
James River Bridge - Appro..	\$490,835,000
HRBT-Approaches	\$149,260,000
High Rise Bridge - Approac..	\$302,850,000
460 Connector	\$18,715,000
<b>Grand Total</b>	<b>\$8,121,430,500</b>



# Special Structures – Long-Term Plan, Structure Replacements

\*All amounts in 2019 dollars



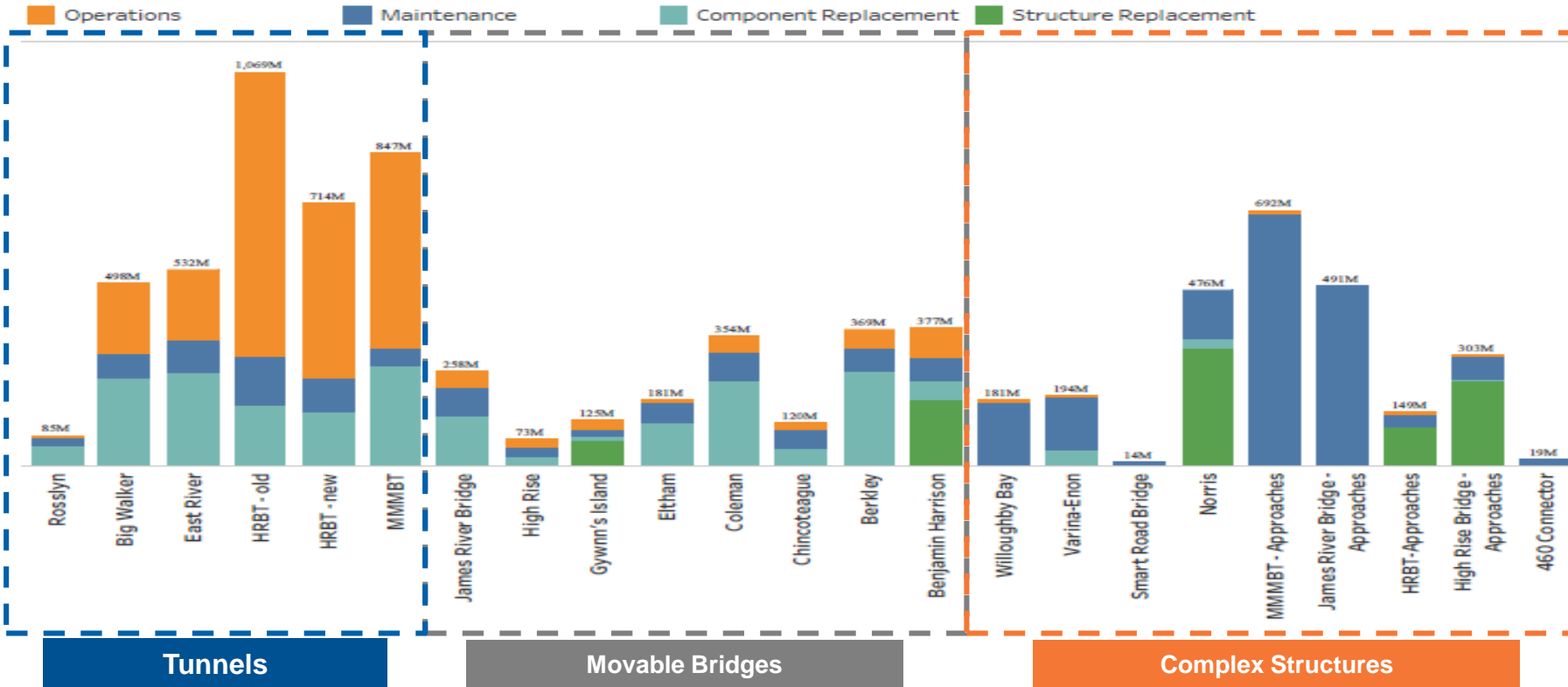
# Special Structures Summary by Work Type

\*All amounts in 2019 dollars

Special Structures Summary by Work Type

Category	Work Type
Tunnel	Structure Replacement
Movable Bridge	Component Replacement
Complex Structure	Maintenance
Grand Total	Operations
	Grand Total

Special Structure	Average per year
Rosslyn	\$84,721,000
Big Walker	\$498,040,000
East River	\$531,625,000
HRBT - old	\$1,068,830,000
HRBT - new	\$713,690,000
MMMBT	\$847,260,000
James River Bridge	\$257,700,000
High Rise	\$72,712,000
Gwynn's Island	\$125,295,000
Eltham	\$181,375,000
Coleman	\$354,338,000
Chincoteague	\$120,212,500
Berkley	\$369,455,000
Benjamin Harrison	\$377,327,000
Willoughby Bay	\$180,920,000
Varina-Enon	\$193,850,000
Smart Road Bridge	\$13,670,000
Norris	\$476,370,000
MMMBT - Approaches	\$692,380,000
James River Bridge - Approaches	\$490,835,000
HRBT-Approaches	\$149,260,000
High Rise Bridge - Approaches	\$302,850,000
460 Connector	\$18,715,000
Grand Total	\$8,121,430,500



# Summary – Special Structures

Current investment: \$50M per year, FY 2020

Special Structures			Avg. Total Cost per Year, \$ Millions	
Tunnels	Movable Bridges	Complex Structures	Years 1-4	Years 5-50
			\$152	\$162
Cost differential to current investment:			(\$102)	(\$112)

All amounts in 2019 dollars

Cost per year rises to \$162M on completion of new HRBT tunnel



# Special Structures – Long Term Sustainability

## Underway

- **Developed prioritization process to assess risk of individual work category activities**
- **Investigating alternative delivery methods**
  - **Request for Information to Industry (Due Nov 18<sup>th</sup>)**
  - **Will provide input into P3 screening analysis**
- **Long-Term Plan**
  - **Periodic Updates**



Office of Public-Private Partnerships

HOME

PROJECTS

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PUBLIC ENGAGEMENT

## STATEWIDE SPECIAL STRUCTURES

### REQUEST FOR INFORMATION (RFI):

The Virginia Department of Transportation (VDOT) is considering options to rehabilitate and/or replace, operate and maintain 17 Statewide Special Structures as identified in the 2018 VITAL Infrastructure Report to the General Assembly. VDOT is currently exploring the options to procure and deliver the Statewide Special Structures under the Public Private Partnership Transportation Act of 1995 (PPTA). VDOT is also considering opportunities to bundle any of the Special Structures with other transportation facilities in the Commonwealth into a single project to rehabilitate and/or replace, operate



# Special Structures - Movable Bridges/Tunnels Performance

No federal performance requirements

Performance measures being developed that consider

## Movable Bridges

- Structural performance
- Electrical/Mechanical reliability

## Tunnels

- Structural Performance
- Mechanical – Mechanical, Electrical, Fire-Life-Safety
- Operational – Roadway, Traffic Control, Lighting, Drainage

VDOT creating standard methodology for level of service

## Performance Measures Being Developed:

- Health Index
  - Reliability
  - Remaining service life

Risk Based Example – Movable Bridges

Description	Useful Life (Years)	Age (Years)	Risk
Generator	30	40	Lifting mechanism doesn't operate
Lifting Cables	30	45	

# COMPREHENSIVE REVIEW SUMMARY AND NEXT STEPS

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

November 20<sup>th</sup>, 2019

# Summary - Pavement Investment Options

Current investment: \$425M per year, FY 2020 – September CTB Meeting

Targets, % Sufficiency			Avg. Total Cost per Year, \$ Millions					
IS	PR	SC	Years 1-6			Years 7-20		
			IS	PR	SC	IS	PR	SC
<b>Current Policy</b>			88	171	227	111	193	203
82%	82%	65%	\$486			\$507		
Cost differential to current investment:			(\$61)			(\$82)		
<b>Proposed Target</b>			88	150	225	111	185	203
82%	82% for $\geq 3,500$ 75% for $< 3,500$	82% for $\geq 3,500$ 60% for $< 3,500$	\$463			\$499		
Cost differential to current investment:			(\$38)			(\$74)		

 **Current Policy**

 **Proposed Targets**

\*All amounts in 2019 dollars

# Summary - Structures Investment Options

Current investment: \$384M per year, FY 2020 – September CTB Meeting

Targets, % Not-SD				Avg. Total Cost per Year, \$ Millions		
IS	PR	SC	All Systems Average GCR	Years 1-50		
				IS	PR	SC
<b>Current Policy</b>				161	222	123
99%	96%	94%	N/A	\$506		
Cost differential to current investment:				<b>(\$122)</b>		
<b>Proposed Target</b>				113	158	113
97% No Postings	93%	90%	Average GCR ≥ 5.6	\$384		
Cost differential to current investment:				<b>\$0</b>		



**Current Policy**



**Proposed Target**

**\*All amounts in 2019 dollars**

# Summary – Routine Maintenance and Special Structures

Current investment: \$725M per year, FY 2020 – October CTB Meeting

Routine Maintenance	Avg. Total Cost per Year, \$ Millions
Performance metrics and targets in place and focus on proactive approach	\$725
Cost differential to current investment:	\$0

Current investment: \$50M per year, FY 2020 – November CTB Meeting

Special Structures			Avg. Total Cost per Year, \$ Millions	
Tunnels	Movable Bridges	Complex Structures	Years 1-4	Years 5-50
			\$152	\$162
Cost differential to current investment:			(\$102)	(\$112)

\*All amounts in 2019 dollars

# Comprehensive Review – Annual Investment Summary (FY 2021)

**Assuming acceptance of revised performance targets for pavements and structures**

	Pavements		Structures	Special Structures		Routine Maintenance
	Years 1-6	Years 7-20		Years 1-4	Years 5-50	
<b>Current Investment \$M per year</b>	\$425	\$425	\$384	\$50	\$50	\$725
<b>Required Investment \$M per year, 2019 Dollars</b>	\$463	\$499	\$384	\$152	\$162	\$725
<b>Difference</b>	<b>(\$38)</b>	<b>(\$74)</b>	<b>\$0</b>	<b>(\$102)</b>	<b>(\$112)</b>	<b>\$0</b>

**\*All amounts in 2019 dollars**

# Comprehensive Review – December Actions

## The following request in December 2019

- **Pavements - Approval of new performance targets**
- **Structures - Approval of new performance measures and targets**
  - **Change to preservation first**
- **Special Structures – Support prioritization health index and risk based prioritization of projects**
- **Approve the Comprehensive Review Report for the General Assembly**
  - **Draft report available December 1st**
- **Require an Annual Report that summarizes planned and actual achievement**
  - **Annual CTB Report anticipated October of each year**



