



MAINTENANCE AND OPERATIONS PROGRAM COMPREHENSIVE REVIEW BACKGROUND

 Kevin Gregg, Chief of Maintenance and Operations

September 20, 2022

Maintenance and Operations Program Comprehensive Review

Why?

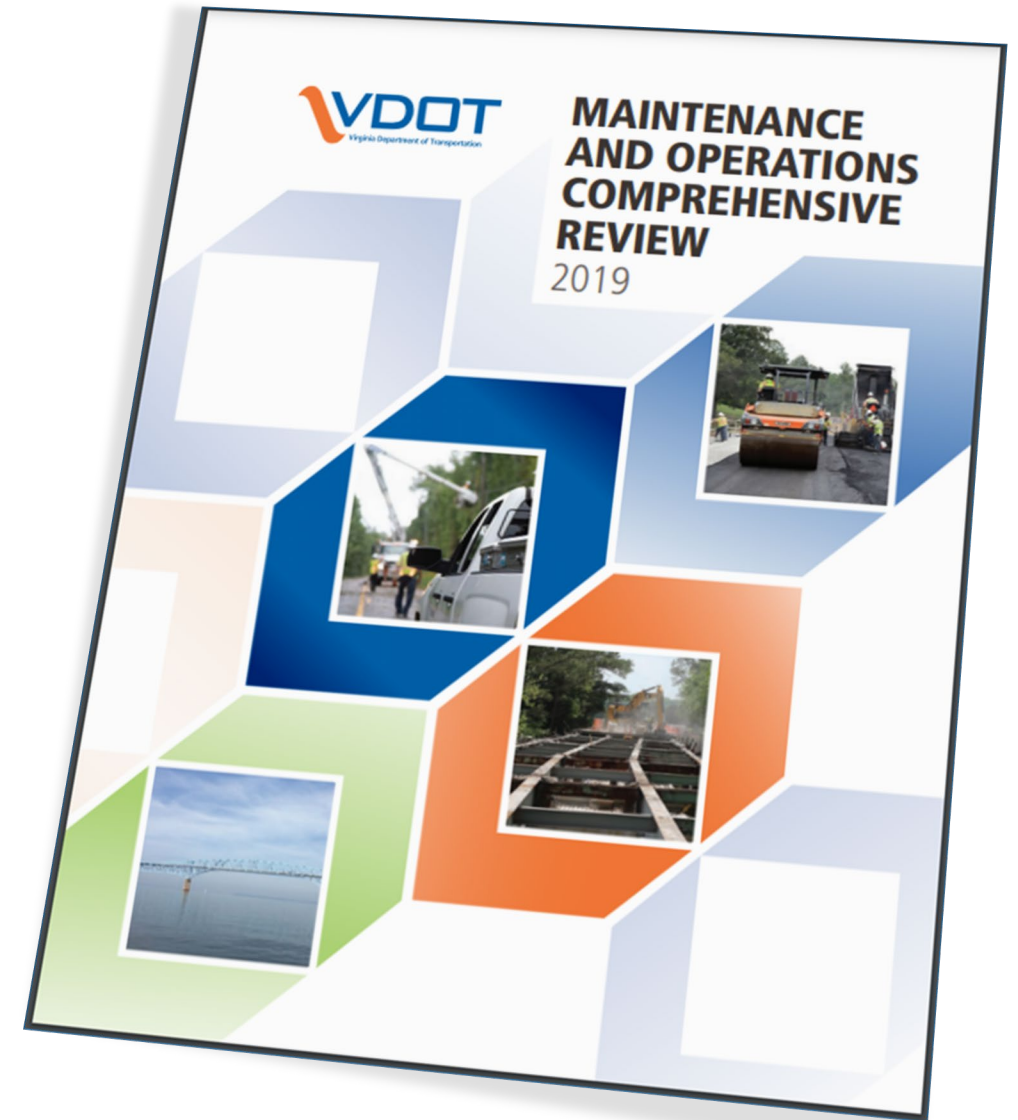
- Commissioner of Highways – business focus
- Impact on future generations – shift from short term
- Back to basics

Investment Strategy – Long-Term Sustainable Performance of Assets

- Pavements (20 Year)
- Bridges (50 Year)
- Special Structures
- Routine Maintenance

Investments

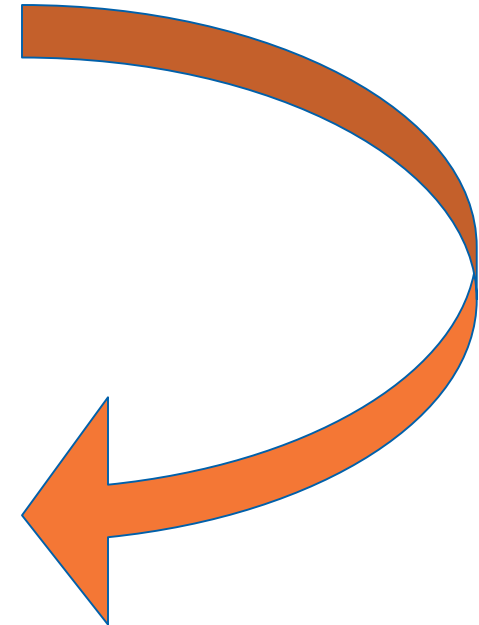
- Maintenance and Operations Program
- State of Good Repair Program



Pavement Condition Assessment Process

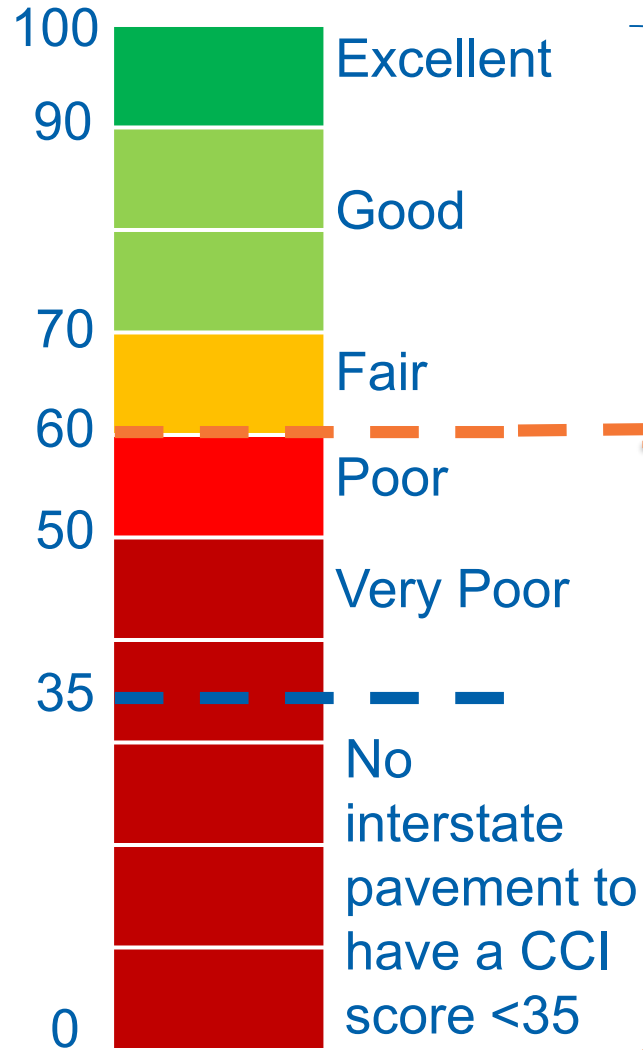
Pavement Assessment Process

Interstate and Primary – annual
Secondary – 20% annually



Pavement Rating – Critical Condition Index (CCI)

CCI

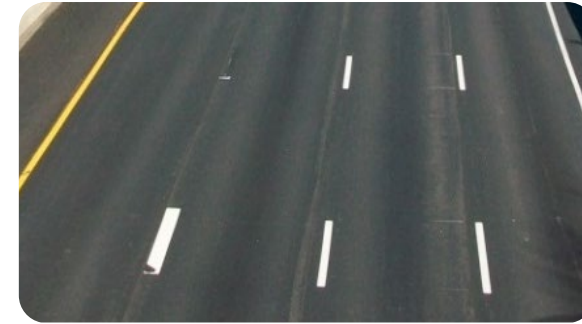


Sufficiency

Percentage is the percentage of lane miles with a CCI score ≥ 60

SGR Eligible is CCI < 60

What does CCI look like?



CCI 90-100
(Excellent)



CCI 50-59
(Poor)



Asphalt



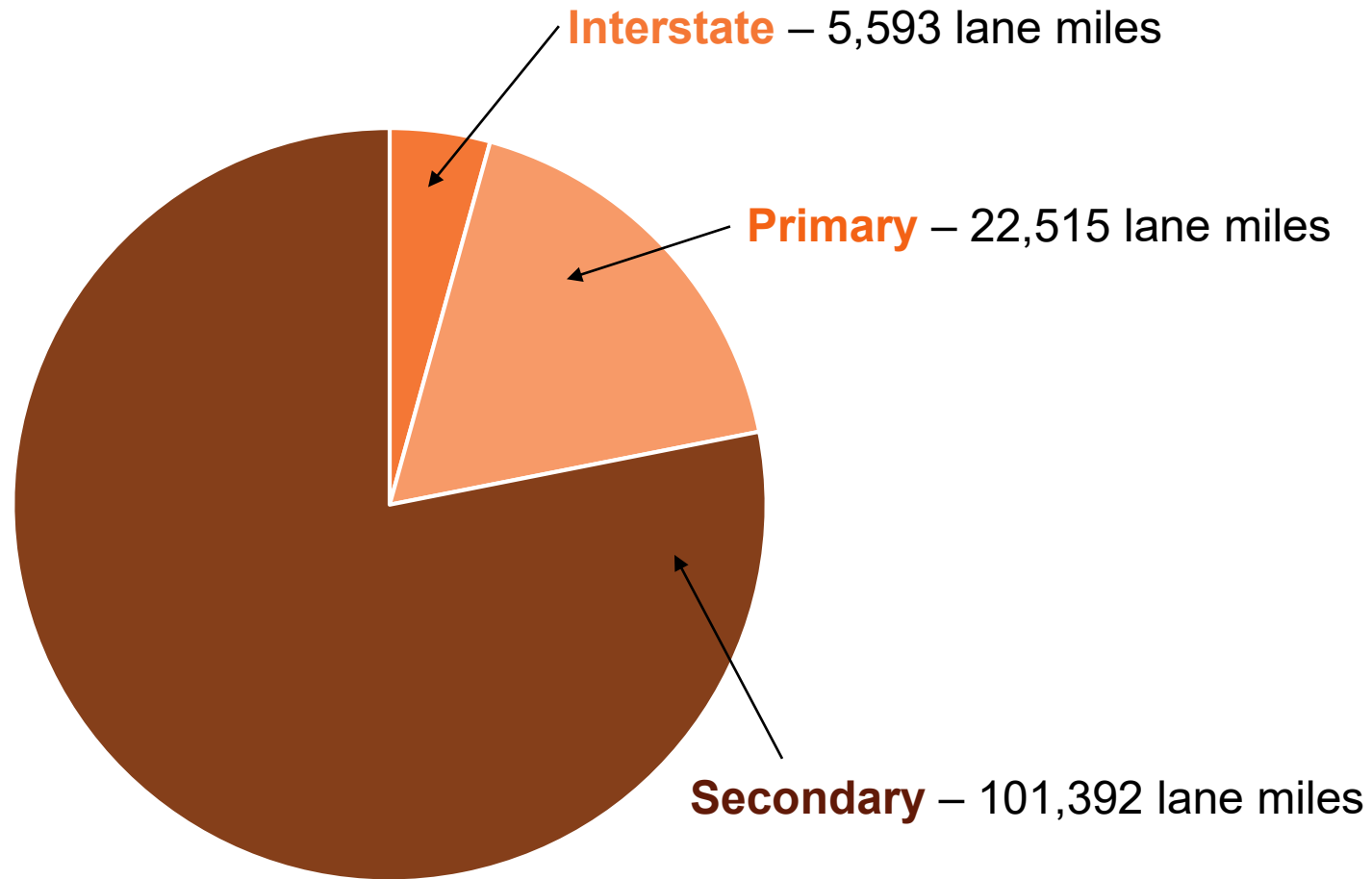
Concrete

CCI < 49
(Very Poor)

Image shows approximately CCI 35

VDOT Pavements – Inventory (Lane Miles)

129,500
Total VDOT Lane Miles



Bridge Condition Assessment Process

Structure Inspection & Assessment Process

FRAZER, BRETT

Bridge: 0416270-000000000 Facility Carried (007): RAMBLE ROAD Inspection: 2016-07-06 (MIHS) Type: Regular NBI Metric English

Inspection > Condition

Condition Ratings

Deck (058): N N/A (NBI) Channel (061): 7 Minor Damage NBI Converter Profile: BrM Default

Superstructure (059): N N/A (NBI) Culvert (062): 8 No Major Problem

Substructure (060): N N/A (NBI) Waterway (071): 8 Equal Desirable

Unrepaired Spalls: (SF)

Element Conditions

Hide Elem Inspection Details Arrow Key Grid Navigation Help

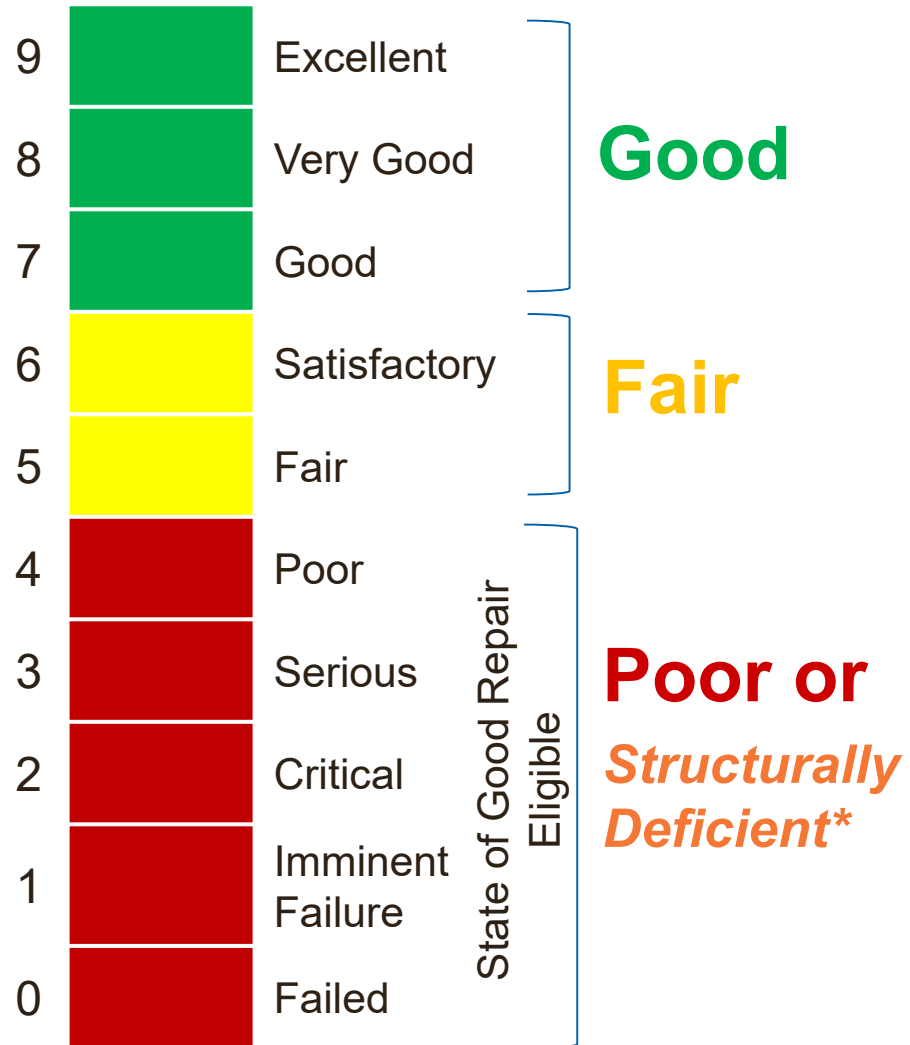
Element: Elem # or Elem Desc. Struct. Unit: All Env.: All Quantity Percent

Elem.	Str. Unit.	Env.	Element Description	Tot. Qty.	Units	Qty1	Qty2	Qty3	Qty4			
241	1	Low (2)	Re Conc Culvert	79	ft	79,000	0	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
824	1	Low (2)	RC Wingwall	4	(EA)	4,000	0	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
831	1	Low (2)	Culvert End/Headwall	2	(EA)	2,000	0	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
833	1	Low (2)	Roadway Ov. Culv.	1	(EA)	1,000	0	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
854	1	Low (2)	Channel	1	(EA)	1,000	0	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

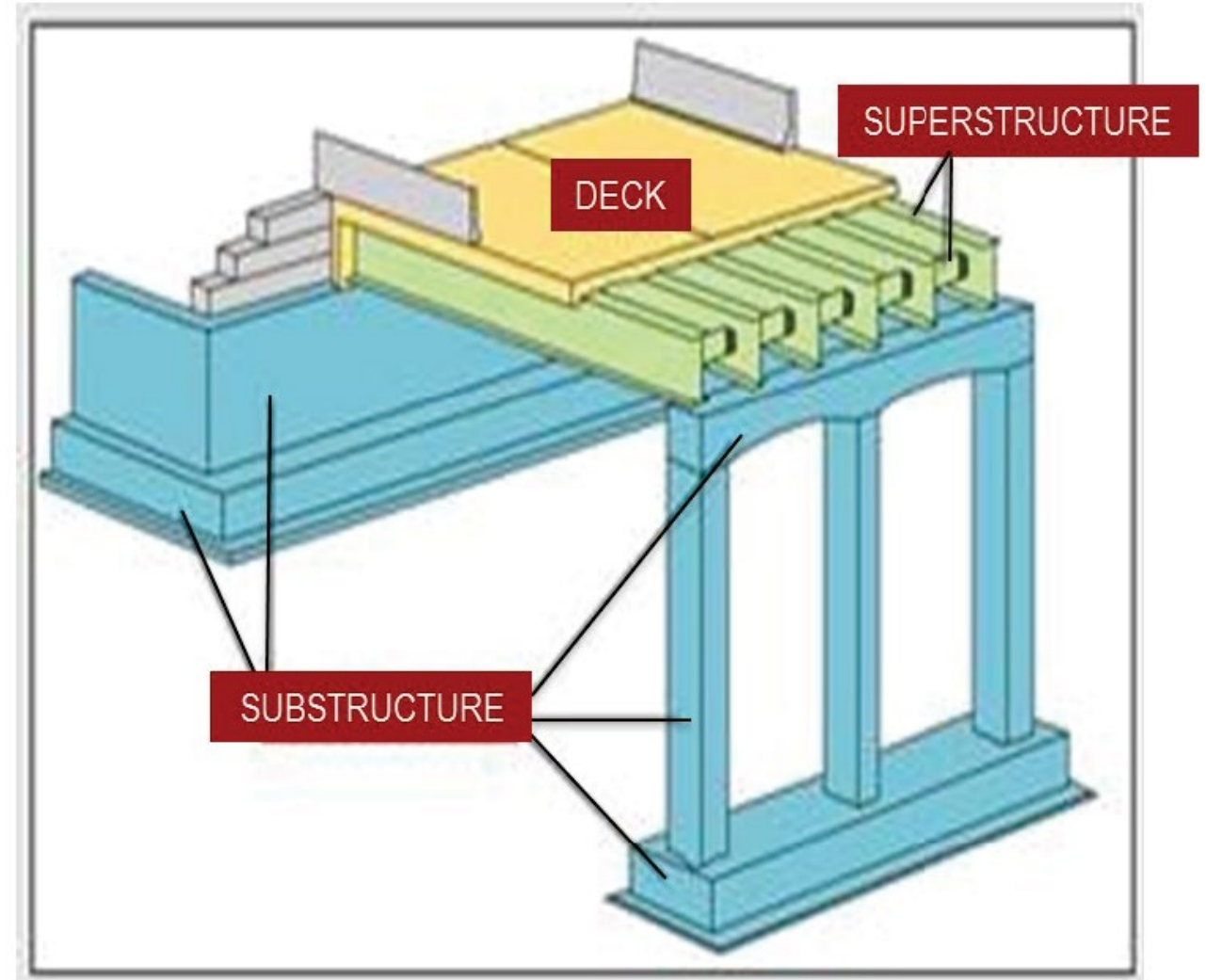
2 year cycle



What is a GCR (General Condition Rating)?

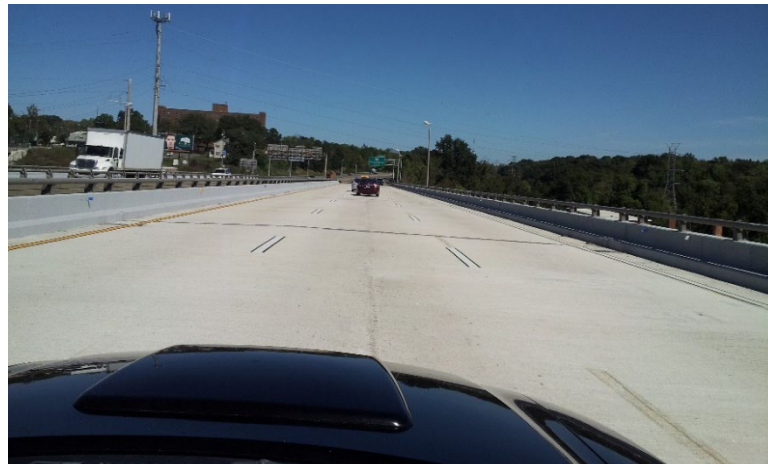


Bridge Components



Examples of Good, Fair, and Poor Bridges

Good



Fair on the "CUSP" of Poor

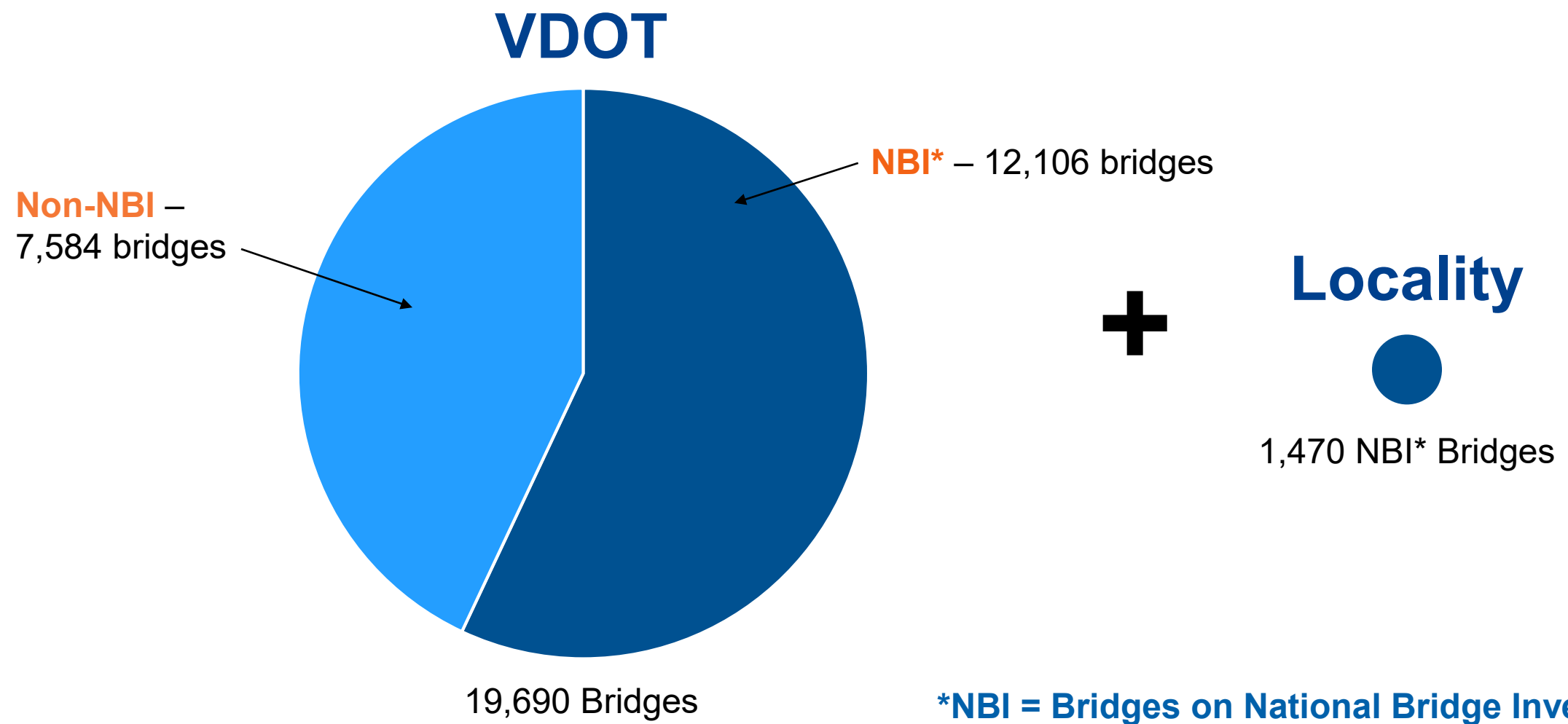


Poor (Structurally Deficient)



VDOT and Locality Bridges – Inventory (Number)

21,160
Total Bridges



***NBI = Bridges on National Bridge Inventory (>20')**

Maintenance and Operations Program

Comprehensive Review – Continued focus on targets

Performance Targets:

All Programs 2019 Investment Needed:

Pavements (20 Year)

Sufficiency = percent of lane miles with CCI \geq 60

	MEASURES AND TARGETS SUFFICIENCY
Interstate	82%
Primary	82% FOR \geq 3,500 AADT 75% FOR $<$ 3,500 AADT
Secondary	82% FOR \geq 3,500 AADT 60% FOR $<$ 3,500 AADT



Bridges (50 Year)

Preservation Approach

Sufficiency = percent of structures with GCR \geq 5

	NEW PERFORMANCE MEASURES AND TARGETS SUFFICIENCY
All Systems	AVERAGE WEIGHTED GCR \geq 5.6
Interstate	\geq 97%
Primary	\geq 93%
Secondary	\geq 90%

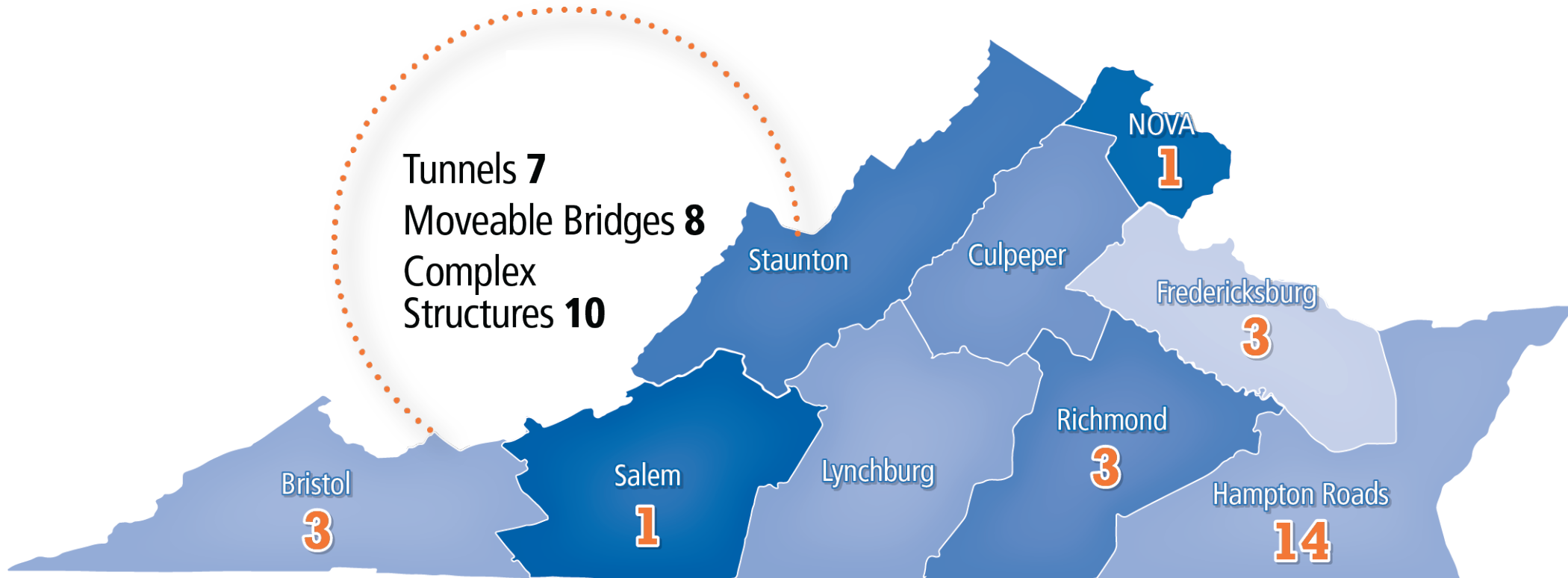


*2019 dollars.

GCR is a national (defined by FHWA) rating system (0-9 scale) for bridge components.

Special Structures

Special Structures – Current 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 - Tunnels

Mountain Tunnels

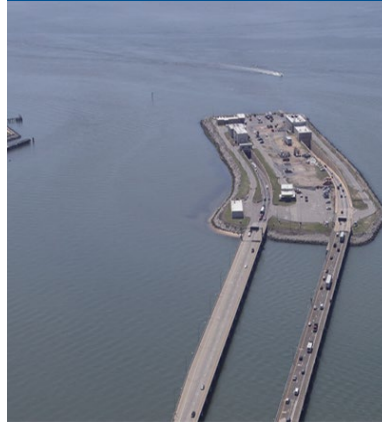
Big Walker Mountain Tunnel



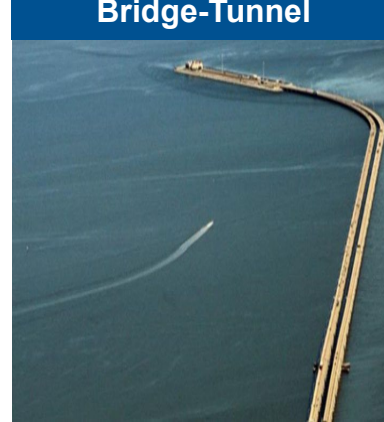
East River Mountain Tunnel



Hampton Roads Bridge-Tunnel



Monitor-Merrimac Memorial Bridge-Tunnel



Elizabeth River Tunnel (Midtown)



Elizabeth River Tunnel (Downtown)



Gateway Park / Rosslyn Tunnel

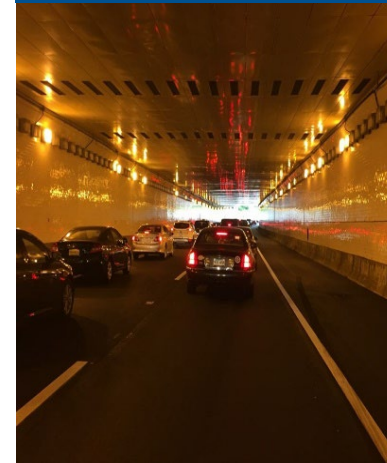
3 Highway bridges, 7 Pedestrian bridges, 2 In-fill (deck or park) structure



Gateway Park



Rosslyn Tunnel



Special Structures - Movable Bridges

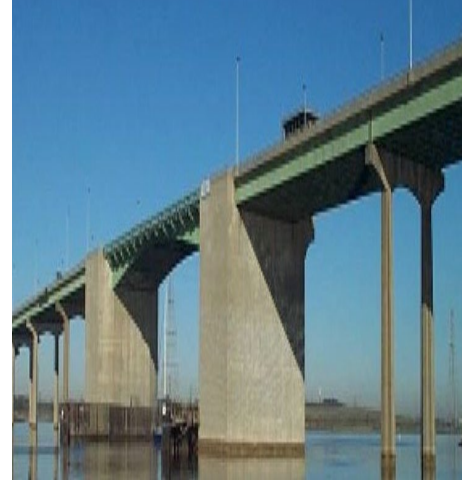
Benjamin Harrison Memorial Bridge



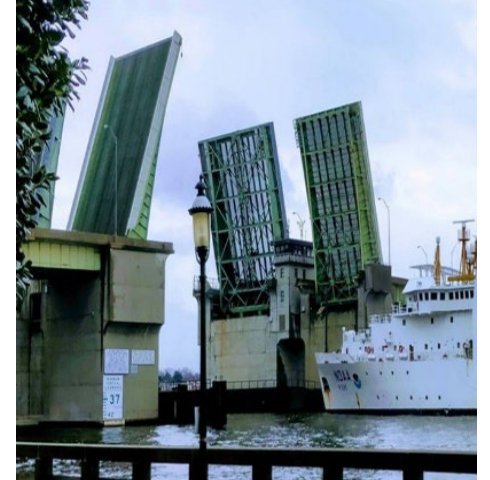
John B. Whealton Memorial Causeway Bridge (Chincoteague)



High Rise Bridge



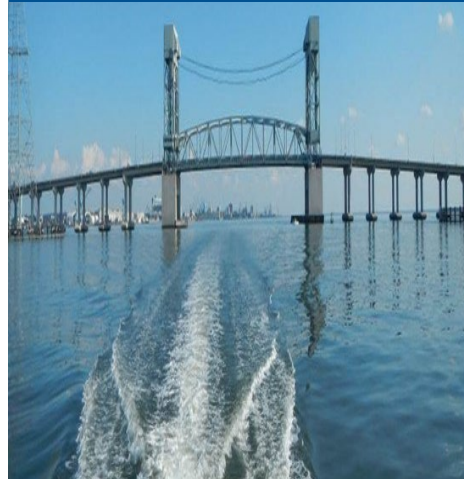
Berkeley Bridge



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**



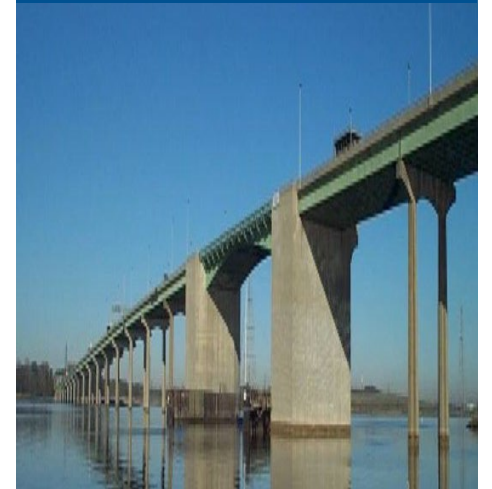
James River Bridge



Robert O. Norris Bridge



High Rise Bridge



Special Structures – Movable Inspection

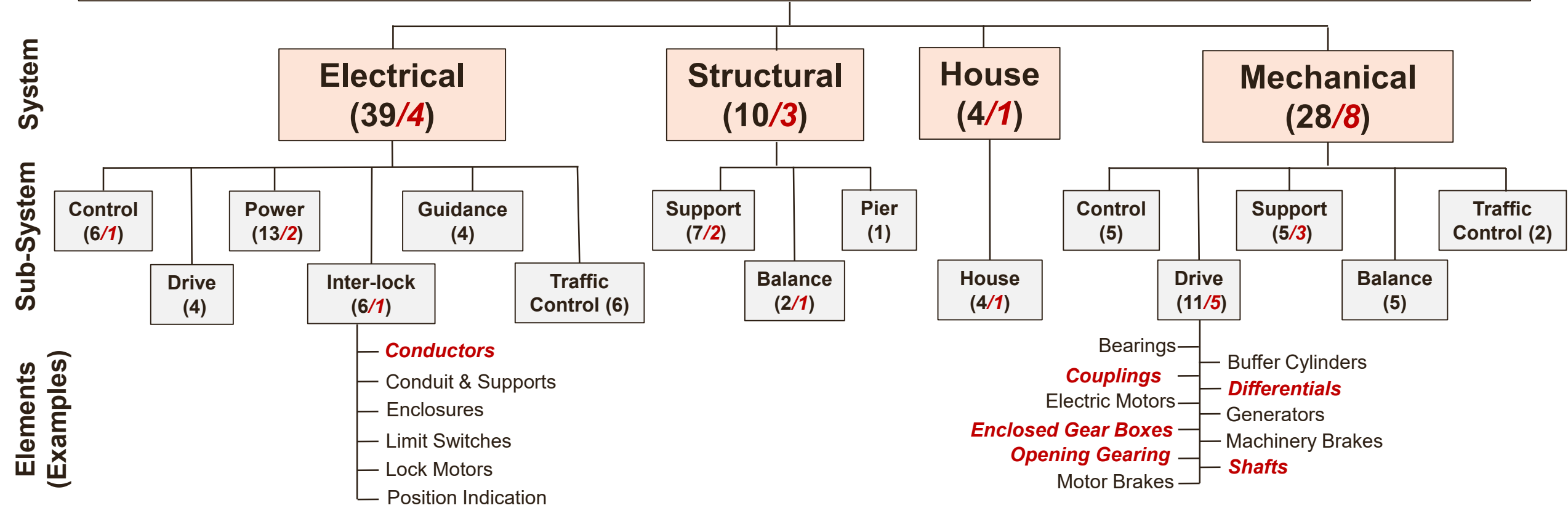


Every two years



Special Structures - Movable Bridges Health Index

Movable Bridge Example
(4 Systems, 15 Subsystems, 81 Elements & 16 Critical Elements)



Special Structures - Movable Bridges Health Index

Health Index for Movable Bridges (CURRENT)					
Bridge	Electrical	House	Mechanical	Structural	Overall HI/Bridge
Benjamin Harrison	Orange	Yellow	Orange	Yellow	Orange
Berkley EBL	Orange	Yellow	Yellow	Yellow	Yellow
Berkley WBL	Orange	Yellow	Orange	Orange	Orange
Chincoteague	Green	Green	Yellow	Yellow	Green
Coleman	Yellow	Green	Yellow	Orange	Yellow
Eltham	Yellow	Green	Green	Green	Yellow
Gwynn's Island	Orange	Yellow	Orange	Red	Orange
High Rise	Orange	Green	Yellow	Yellow	Yellow
James River	Orange	Yellow	Yellow	Yellow	Yellow

Current: Percentage & Number of Systems in Each Condition Category	
Good	19% (7)
Fair	47% (17)
Poor	31% (11)
Severe	3% (1)

Health Index for Movable Bridges (10 YEAR PREDICTION)					
Bridge	Electrical	House	Mechanical	Structural	Overall HI/Bridge
Benjamin Harrison	Green	Yellow	Yellow	Yellow	Green
Berkley EBL	Green	Yellow	Green	Yellow	Green
Berkley WBL	Green	Yellow	Green	Yellow	Green
Chincoteague	Green	Green	Yellow	Yellow	Yellow
Coleman	Green	Green	Green	Orange	Green
Eltham	Yellow	Green	Yellow	Yellow	Yellow
Gwynn's Island	Green	Green	Green	Green	Green
High Rise	Yellow	Yellow	Yellow	Yellow	Yellow
James River	Green	Yellow	Green	Yellow	Green

Predicted in 10 Years: Percentage & Number of Systems in Each Condition Category	
Good	47% (17)
Fair	50% (18)
Poor	3% (1)
Severe	0% (0)

Special Structures – Tunnel Inspection

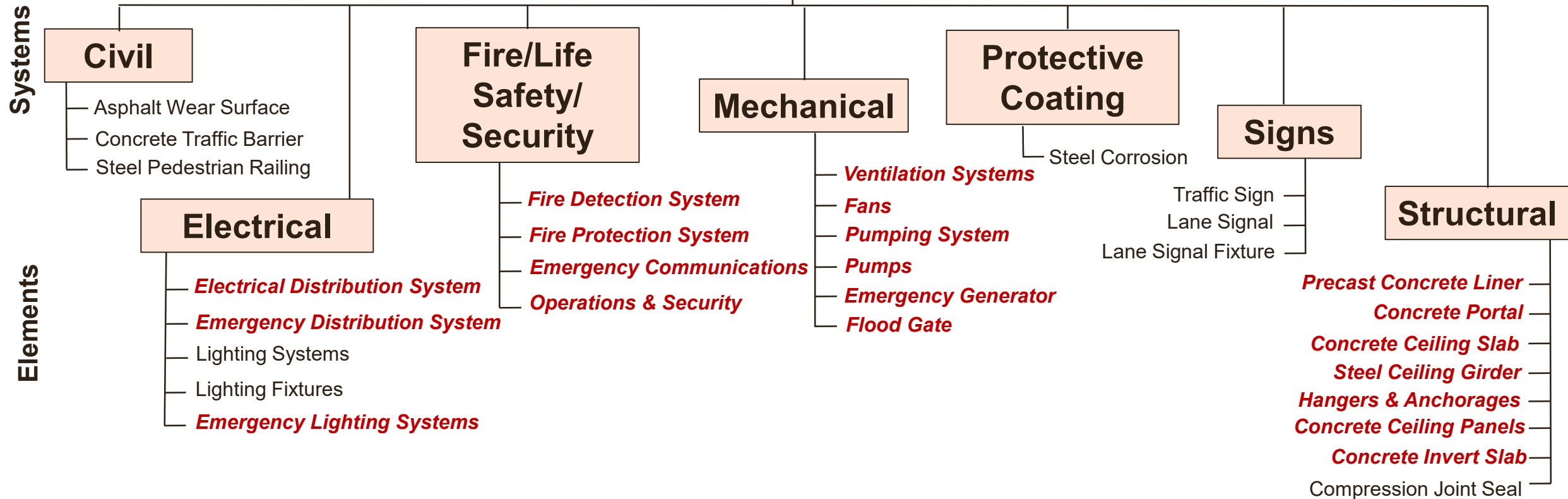


Every two years



Special Structures - Tunnels Health Index

Tunnel Example (7 Systems, 30 Elements & *20 Critical Elements*)



Special Structures - Tunnels Health Index

Health Index for Tunnels (CURRENT)						
Tunnel	Civil	Electrical	Fire/Life Safety/Security	Mechanical	Structural	Overall HI per Tunnel
Big Walker	Green	Yellow	Yellow	Yellow	Green	Yellow
East River	Green	Orange	Orange	Orange	Green	Yellow
Hampton Roads Eastbound	Green	Green	Yellow	Yellow	Yellow	Yellow
Hampton Roads Westbound	Green	Green	Yellow	Yellow	Yellow	Yellow
Monitor Merrimac	Green	Yellow	Yellow	Yellow	Green	Yellow
Rosslyn	Green	Yellow	Yellow	Orange	Yellow	Yellow

Current: Percentage & Number of Systems in Each Condition Category	
Good	33% (10)
Fair	53% (16)
Poor	13% (4)
Severe	0% (0)

Health Index for Tunnels (10 YEAR PREDICTION)						
Tunnel	Civil	Electrical	Fire/Life Safety/Security	Mechanical	Structural	Overall HI per Tunnel
Big Walker	Green	Green	Green	Green	Green	Green
East River	Green	Green	Green	Green	Green	Green
Hampton Roads Eastbound	Green	Green	Green	Green	Yellow	Green
Hampton Roads Westbound	Yellow	Green	Green	Green	Green	Green
Monitor Merrimac	Green	Green	Yellow	Yellow	Green	Yellow
Rosslyn	Green	Green	Green	Yellow	Green	Yellow

Predicted in 10 Years: Percentage & Number of Systems in Each Condition Category	
Good	73% (22)
Fair	27% (8)
Poor	0% (0)
Severe	0% (0)

Routine Maintenance

VDOT – Work Areas

Central Office: 1

Districts: 9

Residencies: 31

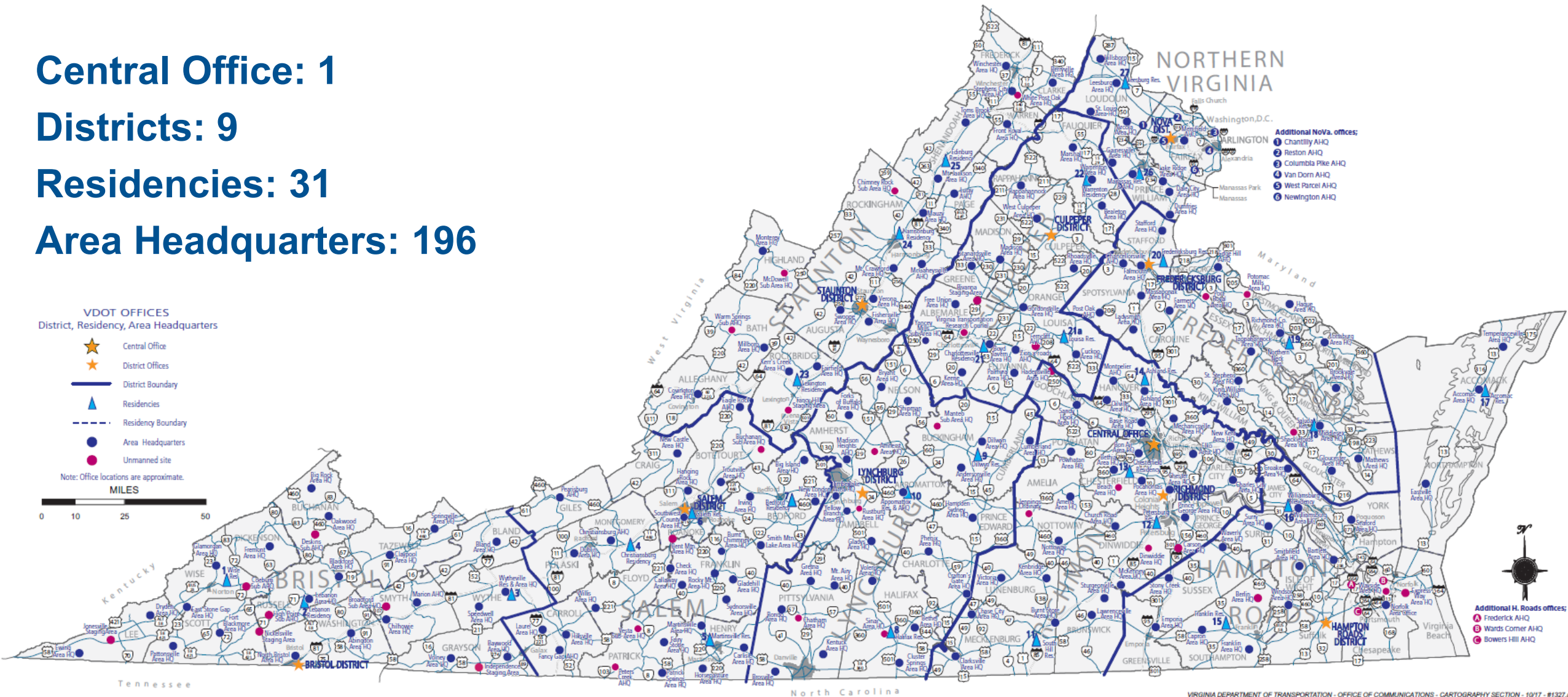
Area Headquarters: 196

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

Back to Basics

Targeted work

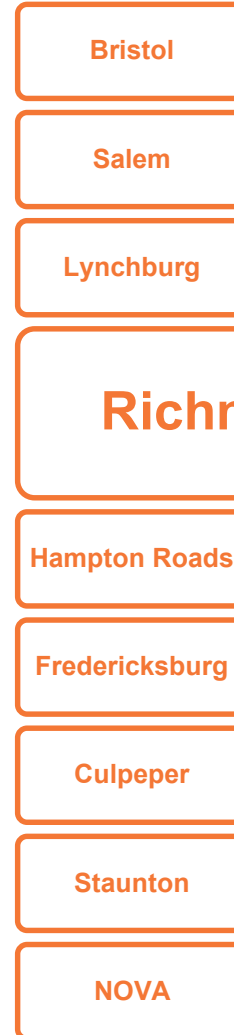
- Ditching
- Pipes
- Unpaved shoulders
- Roadway patching

Non-targeted work

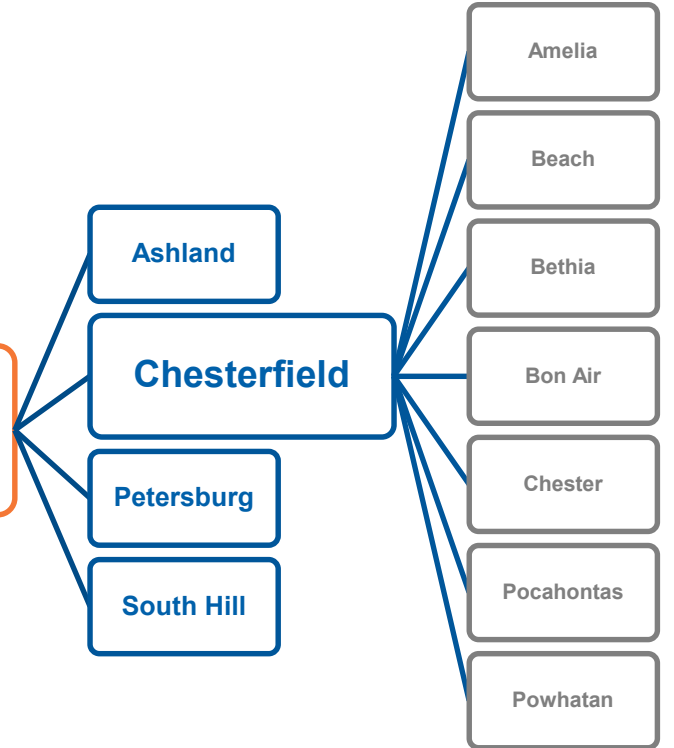
- Sound walls/fences
- Daylighting of signs
- Maintenance of closed drainage facilities

Budget Distribution

9 Districts



31 Residencies



196 AHQ

Area Headquarters

- Salaries
- Equipment
- Materials

Routine Maintenance – Performance Metrics

Asset	Best Practice Frequency	2019 Target Frequency	Statewide Annual Target	
Turf (Mowing)	3 times / yr	IS: 3 times / yr PR: 3 times / yr SC: 2 times/ yr	340,600	acres
Trees	10% of inventory	6% of inventory	8,200	shoulder miles
Pipes	20% of inventory	10% of inventory	33,900	each
SWM Facilities	2 times / yr	2 times / yr	4,400	each
Ditches	20% of inventory	5% of inventory	4,400	ditch miles
Unpaved Roads	4 times / yr	4 times / yr	25,500	center line miles
Unpaved Shoulders	20% of inventory	20% of inventory	14,800	shoulder miles
Signs	7% of inventory	5% of inventory	47,300	each
Signals	20% of inventory	20% of inventory	630	each
Pavement Marking	Material dependent	70% of inventory	50,800	miles

Questions