



COMMONWEALTH of VIRGINIA  
*Office of the*  
SECRETARY of TRANSPORTATION

# Federal Transportation Performance Management

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# Federal Performance Management Background

- MAP-21 Federal Law – established performance measures for:
  - Infrastructure Condition
    - Bridge
    - Pavement
  - System Performance
    - Highway and Freight Reliability
    - Traffic Congestion
    - Emission Reduction
  - Established 4-year Performance Periods to monitor performance

October 1 Submission Deadline
1st Performance Period Final Report (2018-2021)
2nd Performance Period Baseline Report (2022- 2025)

# Federal Performance Management Requirements

## Performance Period Requirements

- Each 4-year **Performance Period** (based on Calendar year) requires:
  - Development of 2-year and 4-year targets
  - Baseline Report
    - Establishes baseline conditions, targets and strategies to achieve targets
  - Mid-Term Performance Report
    - Identifies mid-point performance and updates to strategies to achieve targets
    - Provides opportunity to adjust 4-year targets (requires justification)
  - Final Performance Report
    - Discusses actual performance, observed trends, and investment strategies that impact performance

# FHWA Determination of “Significant Progress”

How are  
we  
doing?



- Biennially, FHWA makes a determination of **Significant Progress** towards meeting the 2- and 4-year targets
- **Significant Progress** determination
  - Actual performance is equal to or greater than targets OR
  - Actual performance is better than baseline performance
- If **Significant Progress** is not made, the state must:
  - Document actions to achieve targets, and
  - Depending on performance measure, may have funding and/or reporting impacts

# Federal Performance Measure Requirements Infrastructure Condition

What do  
we  
measure?



Measures	Scope
<ul style="list-style-type: none"> <li>• Percentage of Bridges in Good Condition</li> <li>• Percentage of Bridges in Poor Condition</li> </ul>	NBI on NHS
<ul style="list-style-type: none"> <li>• Percentage of Pavements in Good Condition</li> <li>• Percentage of Pavements in Poor Condition</li> </ul>	Interstate
<ul style="list-style-type: none"> <li>• Percentage of Pavements in Good Condition</li> <li>• Percentage of Pavements in Poor Condition</li> </ul>	Non-Interstate NHS

The National Highway System (NHS) represents

- 13% of VDOT maintained roads on the Interstate, Primary and Secondary road systems (18,854 lane miles out of 140,238 lane miles)
- 18% of bridge inventory (3,786 out of 21,160 bridges)

Note: Bridge targets and performance includes bridges “owned by others” i.e. Federal, Private, and Border Bridges

NHS – National Highway System

NBI – National Bridge Inventory, Bridges over 20 feet in length

# CTB's Role in Performance Management

- § 2.2-229. Office of Intermodal Planning and Investment of the Secretary of Transportation.
  - C. The responsibilities of the Office shall be:
    - 4. To develop measures and targets related to the performance of the Commonwealth's surface transportation network for the Commonwealth Transportation Board's approval, including any performance measurement required by Title 23 or 49 of the United States Code and any measures adopted by the Board pursuant to § 33.2-353
- VDOT has performance objectives and targets for the full system
  - Drives funding decisions
- Federal targets for the federal system
  - Subset of state system
  - Meet federal requirements

# Infrastructure Condition

## Bridge Performance Measures

In 2019, CTB adopted Statewide pavement and bridge performance measures and targets based on Maintenance and Operations Comprehensive Review (**Comprehensive Review**) and investment strategy

State Performance Measures	Federal Performance Measures
<ol style="list-style-type: none"> <li>1. GCR (General Condition Rating)</li> <li>2. Percent <u>non</u>-Poor (Sufficient) Structures</li> </ol>	<ol style="list-style-type: none"> <li>1. Based on Percent in Good Condition</li> <li>2. Percent in Poor Condition</li> </ol>
Applicable to entire network	Applicable to National Highway System portion only
Provides an overall characterization of the general condition of the entire bridge, used on all bridges	Based only on good and poor condition
Drives maintenance decisions, emphasizes long term sustainability and preservation of fair bridges	Used for reporting as required by the FHWA



# Infrastructure Condition

## Federal Bridge Target Setting Approach

Proposed Federal targets are based on predictions of future conditions resulting from the implementation of the optimized investment strategy for all bridges (not just NHS)

- Investment strategy focused on long term performance and sustainability while keeping bridges rated in fair condition from becoming poor
- Improving the percentage of good bridges while they still have useful service life is an inefficient use of funds
- Projected performance (targets) of bridges on the NHS are extracted from the full data set

This results in proposed federal targets for the 2nd performance period reflect a slight decline in performance as a result of the optimized investment strategy on the full system



# Infrastructure Condition

## Federal Bridge Performance and Targets

Measure	1st Performance Period CTB Adopted Targets (percent)		Annual Performance (percent)					2nd Performance Period Proposed Targets (percent)	
	2-yr (2019)	4-yr (2021)	2017	2018	2019*	2020	2021	2-yr (2023)	4-yr (2025)
Percentage of NBI Bridges on the NHS in GOOD Condition	33.5	30.5	33.6	32.5	31.8	29.4	29.8	27.2	25.1
Percentage of NBI Bridges on the NHS in FAIR Condition	n/a	n/a	62.9	64.5	65.6	67.5	67.2	n/a	n/a
Percentage of NBI Bridges on the NHS in POOR Condition	3.5	3.0	3.5	3.0	2.6	3.1	3.0	3.3	3.6

\*Virginia did not make **Significant Progress** toward its original 2-year target for Percentage of NBI Bridges on the NHS in Good Condition. The CTB adopted a revised 4-year target in September 2020.

NHS – National Highway System  
NBI – National Bridge Inventory

# Infrastructure Condition

## Pavement Performance Measures

In 2019, CTB adopted Statewide pavement and bridge performance measures and targets based on Maintenance and Operations Comprehensive Review (**Comprehensive Review**) and investment strategy

State Performance Measures	Federal Performance Measures
<ol style="list-style-type: none"> <li>1. CCI (Critical Condition Index)</li> <li>2. Percent Sufficient (CCI 60 or greater)</li> </ol>	<ol style="list-style-type: none"> <li>1. Percent in Good Condition</li> <li>2. Percent in Poor Condition</li> </ol>
Applicable for entire network by system	Applicable to National Highway System portion only
Based on ten or more distresses for each pavement type	Based on two or three distresses for each pavement type
Drives maintenance decisions and focuses on long term sustainability	Used only for reporting as required by the FHWA

# Infrastructure Condition

## Federal Pavement Target Setting Approach

Proposed Federal targets are based on predictions of future conditions from the implementation the optimized investment strategy for all pavements (not just NHS)

- Investment strategy focused on long term performance of the pavement network
- Predicted performance of the pavement network based on state performance measures which are correlated to produce performance on the Federal portion of the network
- The predicted performance combined with the historical performance trends are used to develop the federal targets

This approach results in proposed targets that reflect expected performance on the federal portion of the network while the strategy is aimed at improving and maintaining performance the full VDOT maintained network.

# Infrastructure Condition

## Federal Pavement Performance and Targets

### Interstate

How are  
we  
doing?



Measure (Percentage of)	1st Performance Period CTB Adopted Targets (percent)		Annual Performance (percent)					2nd Performance Period Proposed Targets (percent)	
	2-yr (2019)	4-yr (2021)	2017	2018	2019*	2020	2021	2-yr (2023)	4-yr (2025)
Pavement on the Interstate in GOOD Condition	45	45	57.8	57.5	57.9	56.3	57.3	45	45
Pavement on the Interstate in FAIR Condition	n/a	n/a	41.7	42.2	41.8	43.5	42.6	n/a	n/a
Pavement on the Interstate in POOR Condition	3.0	3.0	0.5	0.3	0.3	0.2	0.1	3.0	3.0

\*Virginia made **Significant Progress** toward its 2-year targets.

# Infrastructure Condition

## Federal Pavement Performance and Targets

### Non-Interstate National Highway System

How are  
we  
doing?



Measure (Percentage of)	1st Performance Period CTB Adopted Targets (percent)		Annual Performance (percent)					2nd Performance Period Proposed Targets (percent)	
	2-yr (2019)	4-yr (2021)	2017	2018	2019*	2020	2021	2-yr (2023)	4-yr (2025)
Pavement on the Non-Interstate NHS in GOOD Condition	25	25	35.4	34.8	36.7	36.6	33.5	25	25
Pavement on the Non-Interstate NHS in FAIR Condition**	n/a	n/a	63.6	64.3	62.4	62.6	65.2	n/a	n/a
Pavement on the Non-Interstate NHS in POOR Condition**	5.0	5.0	1.0	0.9	0.9	0.8	0.5	5.0	5.0

\*Virginia made **Significant Progress** toward its 2-year targets.

# Federal Performance Measure Requirements

## System Performance - Reliability

What do  
we  
measure?



System Performance Measures*	Scope
Percentage of Person-Miles Traveled that are Reliable	Interstate
Percentage of Person-Miles Traveled that are Reliable	Non-Interstate NHS
Truck Travel Time Reliability Index	Interstate

Reliability: the consistency or predictability in travel times, as measured from day-to-day and/or across different times of the day

\*FHWA requires a specific data set for the analysis of Travel Time Reliability.

# System Performance

## Federal Reliability Target Setting Approach

- Percentage of Person Miles Traveled that are Reliable on the Interstate
  - Based on the model developed for this purpose - CTB presentation in March 2022
- Percentage of Person Miles Traveled that are Reliable on the Non-Interstate
  - Algorithm based on changes in reliability over the past several years along with volume growth
- Truck Travel Time Reliability Index (Interstate only)
  - Linear regression analysis along with volume growth

Note: Development of each measure considers the impact of infrastructure improvements; however, additional work is underway to improve the analysis and better understand the benefits of investments on reliability.



# System Performance

## Federal Reliability Performance and Targets

How are  
we  
doing?



Measure	1st Performance Period CTB Adopted Targets		Annual Performance					2nd Performance Period Proposed Targets	
	2-yr (2019)	4-yr (2021)	2017	2018	2019	2020	2021	2-yr (2023)	4-yr (2025)
Person-Miles Traveled that are Reliable - Interstate (%)	82.2%	82.0%	84.3%	82.4%	83.6%	93.8%	86.3%	85.0	85.0
Person-Miles Traveled that are Reliable - Non-Interstate NHS (%)	n/a	82.5%	86.8%	88.0%	88.9%	97.76%	95.0%	88.0	88.0
Truck Travel Time Reliability Index	1.53	1.56	1.48	1.58	1.55*	1.32	1.49	1.64	1.64

\*Virginia did not make **Significant Progress** toward its original 2-year target for Truck Travel Time Reliability Index. No change to the 4-year target was proposed.

# Federal Performance Measure Requirements

## Traffic Congestion and Air Quality

What do  
we  
measure?



Measures*	Scope
Annual Hours of Peak Hour <b>Excessive Delay</b> (PHED) Per Capita	Interstate
Percent of Non-Single Occupancy Vehicle (SOV) Travel (Mode Share)	Urbanized Area
Total Emission Reductions	CMAQ-funded projects

- Traffic Congestion and Air Quality Targets are set regionally
- Targets for PHED and Mode Share must be identical between the three state DOTs as well as the adjoining Metropolitan Planning Organizations (National Capital Region, Fredericksburg and Baltimore Region)

\*Only required for the National Capital Region.

**Excessive delay** is travel below 60% of the posted speed limit or 20mph, whichever is greater on NHS routes.

# System Performance

## Federal Traffic Congestion and Air Quality

### Target Setting Approach

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- Annual Hours of Peak Hour **Excessive Delay** (PHED) Per Capita
  - Utilized an average of observed trends combined with an indicator value from the Transportation Planning Board (TPB) travel demand model
- Percentage of Non-SOV Travel
  - Based on trend line analysis from data reporting in the American Community Survey
- Total Emissions Reduction is the cumulative 2- and 4-year reported emission reductions for:
  - All new programmed CMAQ funded projects in Northern Virginia
  - Applicable criteria for pollutants
    - Applicable Pollutants: Volatile Organic Compounds (VOC) and nitrogen oxides (NOx)
  - TPB combines the Total Emissions Reduction estimates from each DOT to establish the target for the National Capital Region

# System Performance - Federal Traffic Congestion and Air Quality Performance and Targets

How are we doing?



Measure *	1st Performance Period CTB Adopted Targets		Annual Performance					2nd Performance Period Proposed Targets	
	2-yr (2019)	4-yr (2021)	2017	2018	2019	2020	2021	2-yr (2023)	4-yr (2025)
Annual Hours of Peak Hour Excessive Delay Per Capita (hrs/capita)	n/a	26.7	23.0	24.2	24.5	9.1	12.8	22.5	22.7
Percentage of Non-SOV Travel	36.9%	37.2%	36.6%	36.6%	36.6%	37.0%	39.5%	37.4%	37.7%
Cumulative reported emissions reductions - Volatile Organic Compounds**	1.721	1.985	3.499	2.061	4.491	4.935	8.040	0.323	3.013
Cumulative reported emissions reductions - Nitrogen Oxides**	3.744	4.230	5.369	3.843	9.068	9.164	10.895	0.612	4.911

\*Only required for the National Capital Region.

\*\*Performance values are for Virginia portion and each individual year. Baseline data is cumulative for 2014-2017. Performance period data are cumulative for 2018 through 2021 (meaning 2018 is actual, 2019 is 2018 + 2019, etc.)

# Next Steps

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- CTB Provide feedback on proposed targets
- CTB adoption of Federal targets in September
- By October 1, 2022
  - Develop First Performance Period Final Performance Report
  - Develop Second Performance Period Baseline Report with 2- and 4-year Targets



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Thank you.

