

2022-2025 Baseline Performance Period Summary Report

Office of Intermodal Planning and Investment

December 2022



Executive Summary

Transportation performance management (TPM) requires agencies to use a coordinated, data-driven approach to make transportation investment decisions that support national goals established in recent federal surface transportation authorizations for the Nation’s federal-aid highway and public transportation programs.

The Office of Intermodal Planning and Investment (OIPI), Virginia Department of Transportation (VDOT), Department of Motor Vehicles (DMV), Department of Rail and Public Transportation (DRPT), and Virginia’s 15 MPOs have worked together since 2016 to incorporate the Federal TPM requirements into planning and programming activities. The CTB has adopted targets for the Federal Highway Administration (FHWA) required performance measures, consistent with Federal requirements and the Code of Virginia.

The federal performance measure rules fall into five areas – highway safety, highway asset management, highway system performance, transit asset management, and public transportation safety. This report summarizes 2022-2025 performance targets for the highway asset management and system performance measures. Links to other Federal performance measures are below.

Performance Areas	What is Measured	Where it is Measured
Highway Safety	Roadway fatalities and serious injuries for motorized vehicles, bicyclists, and pedestrians	Public roads
Highway Asset Management	Condition of pavement and bridges	National Highway System (NHS)*
Highway System Performance	Reliability of highway passenger travel	Interstate and non-Interstate NHS
	Reliability of highway truck freight travel	Interstate system
	Highway congestion and emissions	NHS in air quality non-attainment and maintenance areas
Transit Asset Management	Condition of transit vehicles, equipment, and facilities	Public transportation providers operating in Virginia
Transit Safety	Transit related fatalities, serious injuries, and incidents	

*Note: The NHS includes the Interstate Highway System and other roads important to the nation’s economy, defense and mobility.

Virginia set targets during 2022 for 2023 and 2025 based on planned investments and forecasted performance through the use of data driven analysis tools. The CTB adopted these targets at its September 2022 meeting. Performance outcomes from the first performance period (2018-2021) are available for review in the companion Full Performance Period Progress Report.

Measure (second performance period: 2022-2025)	Baseline (2021) Performance	Desired Direction	2023 Target	2025 Target
Interstate Pavement in Good Condition	57.3%	↑	45.0%	45.0%
Interstate Pavement in Poor Condition	0.1%	↓	3.0%	3.0%
Non-Interstate NHS Pavement in Good Condition	33.5%	↑	25.0%	25.0%
Non-Interstate NHS Pavement in Poor Condition	0.5%	↓	5.0%	5.0%
NBI NHS Bridge Deck Area in Good Condition	29.9%	↑	27.2%	25.1%
NBI NHS Bridge Deck Area in Poor Condition	3.0%	↓	3.3%	3.6%
Interstate Travel Time Reliability	86.3%	↑	85.0%	85.0%
Non-Interstate NHS Travel Time Reliability	95.0%	↑	88.0%	88.0%
Truck Travel Time Reliability Index (Interstates)	1.49	↓	1.64	1.64

Introduction

Performance management is a strategic approach that uses system information to inform investment and policy decisions to achieve transportation system performance goals. The Commonwealth Transportation Board (CTB) originally established a performance management framework to assess performance of Virginia’s transportation system in December 2015, when it adopted goals, objectives, and guiding principles for VTrans (Virginia’s statewide transportation plan). These goals have been reconfirmed through VTrans updates, including most recently in [January 2020](#). At the Federal level, in 2016 and 2017, performance management rules based on the last two Federal surface transportation authorizations were required as part of state Department of Transportation and Metropolitan Planning Organization (MPO) transportation planning and programming activities.

The Office of Intermodal Planning and Investment (OIPI), Virginia Department of Transportation (VDOT), Department of Motor Vehicles (DMV), Department of Rail and Public Transportation (DRPT), and Virginia’s 15 MPOs have worked together since 2016 to incorporate the new Federal performance management requirements into planning and programming activities. The CTB has adopted targets for the Federal Highway Administration (FHWA) required performance measures, consistent with Federal requirements and the Code of Virginia § 2.2-229.

Federal Transportation Performance Management Rulemakings

The Moving Ahead for Progress in the 21st Century Act (MAP-21), signed into law in 2012, included provisions that transformed the Federal surface transportation program to be focused on the achievement of performance outcomes related to goals for the national transportation system. The provisions are administered by agencies within the U.S. Department of Transportation (USDOT), including several under the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA). In 2015, the Fixing America’s Surface Transportation (FAST) Act built on the MAP-21 changes and provided funding certainty for surface transportation infrastructure planning and investment. The new Federal surface transportation authorization, also known as the Bipartisan Infrastructure Law (BIL), was signed into law in November 2021, and provides funding certainty through 2027. Performance management provisions associated with this new program are still under development and review through public comment.

To implement the MAP-21 performance management provisions, U.S. DOT proposed and finalized several regulations that established performance measures that transportation agencies are required to use across three broad areas of responsibility – safety, asset management, and system performance.

- The safety performance measures track roadway, bicycle and pedestrian, and transit fatalities and serious injuries, as well as transit safety incidents such as collisions, derailments and evacuations.
- The asset management performance measures track the physical condition of roadway pavement and bridges, and transit equipment, vehicles, and facilities.
- The system performance measures track how reliable travel times are for people and freight over highways, as well as roadway congestion and emissions in areas that currently or recently have experienced poor air quality.

FHWA finalized performance measure rules that address roadway safety (Performance Measure Rule 1, or PM1), pavement and bridge condition (PM2), and highway system performance (PM3). The Federal Transit Administration (FTA) finalized two performance measure rules that address transit assets (vehicles and infrastructure) and transit safety. **This summary report focuses on the PM2 and PM3 performance measures documented in Virginia’s Baseline Performance Period Report provided to FHWA in December 2022.**

In conjunction with the PM2 rule, FHWA also finalized a Transportation Asset Management Plan (TAMP) rule that requires states to develop and implement a TAMP for National Highway System (NHS) roads and bridges within the state to improve and maintain those facilities. While the TAMP rule is not a performance measure rule, it does require that states develop investment strategies in their TAMP that will lead to a program of projects that would make progress toward achieving desired performance levels for pavement and bridge condition.

In addition to the performance measure rules, in 2016, FHWA and FTA issued a final rule for Statewide and Metropolitan Transportation Planning. This planning rule establishes the requirements for state DOTs and MPOs to incorporate performance management into their transportation planning and programming processes, including development of statewide long-range transportation plans (VTrans, a 20+-year horizon) and transportation improvement programs (a 4-year program of planned investments with identified funding).

The National Highway System (NHS) includes the Interstate Highway System as well as other roads important to the nation's economy, defense, and mobility. The NHS was developed by the U.S. Department of Transportation in cooperation with the states, local officials, and MPOs

In Virginia, the NHS includes only 13% of the total VDOT roadway inventory lane miles (approximately 18,800 total NHS lane miles of about 140,200 VDOT maintained lane miles).

Of the approximately 21,300 bridges in Virginia, only 18% or about 3,800 are both on the NHS and in the National Bridge Inventory (> 20 ft in length).

The focus of this report is to highlight Virginia's reporting and target setting approach and reflect anticipated future performance over the next four-years for the FHWA bridge and pavement condition measures and the system performance measures highlighted in Figure 1. More information on the current approach for the roadway safety measures is available [here](#). For the transit performance measures, DRPT coordinates the development of group plans for smaller transit agencies to meet transit asset management and public transit agency safety plan requirements. Information on the DRPT's approach to transit asset management is available [here](#), and transit safety is available [here](#).

Figure 1. FHWA Performance Measures and Status

Safety Measures	Bridge/Pavement Measures	System Performance Measures
<ol style="list-style-type: none"> Number of Fatalities Fatality rate (per 100 million VMT) Number of serious injuries Serious injury rate (per 100 million VMT) Number of non-motorized fatalities and serious injuries 	<ol style="list-style-type: none"> % of pavements on the Interstate system in good condition % of pavements on the Interstate system in poor condition % of pavements on the non-Interstate NHS in good condition % of pavements on the non-Interstate NHS in poor condition NBI NHS bridges in good condition by % of deck area NBI NHS bridges in poor condition by % of deck area 	<ol style="list-style-type: none"> % of person miles traveled on the Interstate system that are reliable % of person miles traveled on the non-Interstate NHS that are reliable Truck travel time reliability index on the Interstate system Annual hours of peak-hour excessive delay per capita** Percent of non-single** occupant vehicle travel Total emissions reduction (CMAQ projects)**
<p>2023 targets adopted in June 2022 by CTB, Targets set annually*</p> <p>* The first three safety measures require coordination with DMV and the National Highway Traffic Safety Administration (NHTSA) to agree on targets.</p>	<p>2023 & 2025 targets adopted by the CTB in Sept. 2022, review 2-year progress in 2024 and 4-year progress in 2026</p>	<p>2023 & 2025 targets adopted by the CTB in Sept. 2022, review 2-year progress in 2024 and 4-year progress in 2026</p> <p>** Currently only required in Northern Virginia.</p>

The entirety of the performance management approach is presented through Federal code and shared through resources on the FHWA Transportation Performance Management (TPM) page, including state-reported performance results by measure through a [State Performance Dashboard](#). The specific code locations for these federal rules are available here:

- **Asset Condition (Bridge and Pavement Measures) – [23 CFR 490.300 & 490.400](#)**: This section of Federal code details the definitions, methodology, and target setting approach for the six bridge and pavement measures.
- **System Performance (Travel Reliability of People and Freight, Congestion, and Emissions Measures) – [23 CFR 490.500, 490.600, 490.700, 490.800](#)**: This section of Federal code details the definitions, methodology, and target setting approach for reliability, freight, congestion, and emissions measures.
- **Asset Management Plans – [23 CFR Part 515](#)**: This section of Federal code details the requirement for states to develop and implement risk-based TAMPs for the NHS to improve or preserve asset condition.
- **Statewide and Metropolitan Transportation Planning – [23 CFR Part 450](#)**: This section of Federal code details the process states and MPOs must follow when developing transportation plans and programs, including performance management requirements.

PM2 and PM3 Performance Targets and Reporting Requirements

States and MPOs are required to establish performance targets for the Federal performance measures. A target is defined as a quantifiable level of performance for a measure to be achieved within a time period. For the PM2 and PM3 measures, targets are established, and performance is assessed and reported over a four-year performance period. The prior performance period, discussed in the companion Full Performance Period Summary Report, covered January 1, 2018, through December 31, 2021. The current performance period covers January 1, 2022, to December 31, 2025. Subsequent performance periods will follow every four years.

For each performance period, states must establish two-year and four-year performance targets for each PM2 and PM3 measure (while MPOs are required only to establish four-year performance targets). Two-year targets represent expected performance at the halfway point of the performance period, while four-year targets represent expected performance at the end of the performance period. States may adjust their four-year targets at the midpoint of the performance period.

States are also required to regularly monitor performance for each measure and report that information to FHWA biennially. During each performance period, states must develop and submit three reports to FHWA:

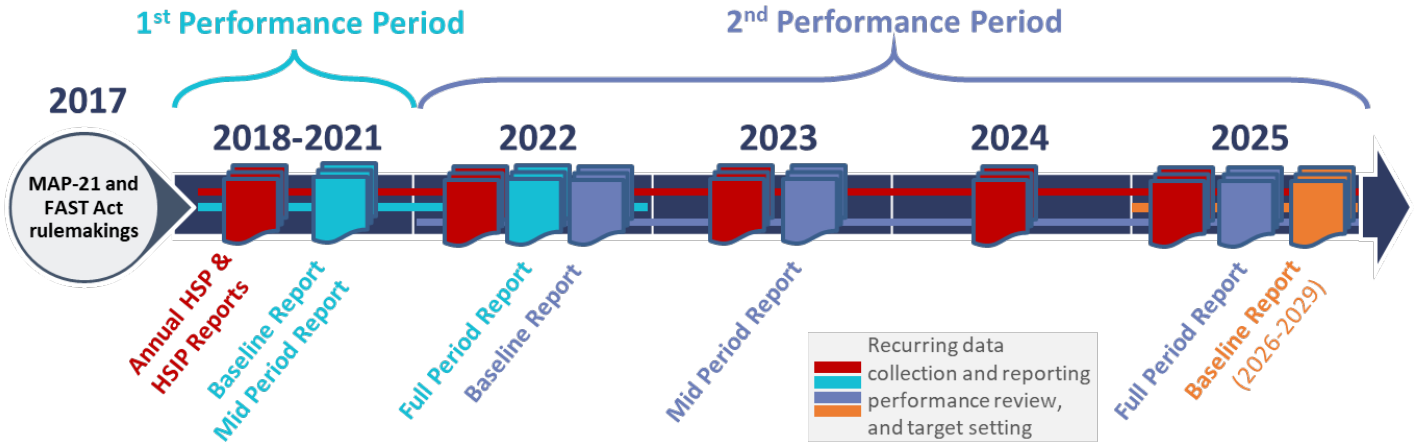
- **A Baseline Performance Period Report (this summary report for 2022-2025)** that documents the performance for each measure at the beginning of the performance period (baseline) and reports the state's two- and four-year targets for each measure;
- **A Mid Performance Period Progress Report (scheduled for submission in October 2024)** that documents performance at the two-year point of the performance period and discusses progress made toward achieving the two-year targets. States may also report any adjustments they made to the four-year target for any measure if they chose to make adjustments.
- **A Full Performance Period Progress Report (scheduled for submission in October 2026)** that documents performance for each measure at the end of the performance period and discusses progress made toward achieving the four-year targets.

FHWA also undertakes a significant progress determination every two years for the PM2 and PM3 measures to assess whether a state has achieved or made significant progress toward targets. FHWA will determine that a state has made significant progress toward each target if either the **actual performance is better than the baseline or actual performance is equal to or better than the target.**

Virginia's Reporting Approach

Virginia completed reporting for the first performance period (2018-2021) through the Full Performance Period Progress Report submitted in December 2022. This report summarizes the Baseline Performance Period Report submitted in December 2022 for the second performance period (2022-2025). On an annual basis, OIPI, VDOT, and DMV work together to submit an annual Highway Safety Plan (HSP) and Highway Safety Improvement Program (HSIP) report to NHTSA and FHWA including performance reviews, strategies, and targets for the next year. Figure 2 presents the reporting approach for the second performance period and a look back at the first performance period.

Figure 2. The Transportation Performance Management Timeline in Virginia



Baseline Performance Period Report Summary

Asset Condition

The PM2 rule established six performance measures for pavement and bridge condition on Interstate and non-Interstate NHS roads in each state:

1. Percentage of Interstate pavements in good condition
2. Percentage of Interstate pavements in poor condition
3. Percentage of non-Interstate NHS pavements in good condition
4. Percentage of non-Interstate NHS pavements in poor condition
5. Percentage of National Bridge Inventory (NBI) bridges on the NHS by deck area classified as in good condition
6. Percentage of NBI bridges on the NHS by deck area classified as in poor condition

The Federal asset condition measures apply only to pavement and bridges on the Interstate and Non-Interstate NHS, which as noted previously represent 13% of total VDOT roadway inventory lane miles and 18% of Virginia bridges.

Like many transportation agencies, VDOT faces critical challenges to maintaining aging infrastructure with limited resources. In part, to address this challenge, in January 2022, VDOT submitted its [2021 Transportation Asset Management Plan](#) to the Federal Highway Administration (FHWA), documenting an asset management program consistent with Federal requirements in 23 CFR 119 and 23 CFR 515. The TAMP was approved by FHWA in August 2022. This 2021 update addressed federal requirements and reflected the 2019 [Maintenance and Operations Comprehensive Review](#) (the “Comprehensive Review”). The Comprehensive Review is an ongoing effort focused on an investment strategy to achieve long-term (at least 20 years) sustainable performance for existing assets such as pavements, bridges (structures) and [Special Structures](#) (25 distinct structures), as well as existing maintenance services such as ditching, drainage repair, and tree removal.

VDOT takes an integrated approach to asset management, focusing on the entire highway system. This integrated approach allows Virginia to meet short-term performance targets while also managing for the future. VDOT has developed a robust asset management program, placing the maintenance of the transportation network at the forefront of agency investment decisions. This commitment to responsible asset management is demonstrated through VDOT’s annual condition data collection programs and its establishment and publication of network-level pavement and bridge performance goals.

Interstate and Non-Interstate NHS Pavement Condition

The effort to implement the investment strategies outlined in the Comprehensive Review is currently underway and further documented specific to the NHS in VDOT’s 2021 TAMP. VDOT is actively implementing the strategies from the Comprehensive Review which allows Virginia to manage its large pavement and bridge inventory while also addressing federal performance requirements applicable to the NHS.

The two-year and four-year performance targets for both interstates and non-interstate NHS pavements were determined based on current performance, historic performance data, and predicted performance trends over the next ten years consistent with investment scenarios analyzed in the TAMP. Interstate and non-interstate NHS pavement are rated based on visible distresses and this data is incorporated into the Pavement Management System. This system uses pavement performance models to predict average pavement deterioration (accounting for pavement distresses, traffic levels, and structural condition) and current levels of pavement funding to be available in future years.

Deteriorated pavement needs on Virginia’s Interstate, Primary, and Primary Extension facilities are used to determine State of Good Repair Paving Needs, which align with the long-term objectives defined in the TAMP. However, factors such as significant cost increases for materials, higher load levels from allowing heavier trucks on roads, and extreme weather conditions may affect future performance and are not accounted for in the modeling process.

Measure	Baseline Performance (2021)	Desired Direction	2-year target (2023)	4-year target (2025)
Interstate Pavement in Good Condition	57.3%	↑	45.0%	45.0%
Interstate Pavement in Poor Condition	0.1%	↓	3.0%	3.0%
Non-Interstate NHS Pavement in Good Condition	33.5%	↑	25.0%	25.0%
Non-Interstate NHS Pavement in Poor Condition	0.5%	↓	5.0%	5.0%

NHS Bridge Condition

As a result of the 2019 Comprehensive Review, VDOT has moved toward a more balanced asset management approach to include the entire VDOT maintained network to enhance long-term sustainability efforts related to existing highway transportation assets and services in Virginia.

Virginia’s bridge inventory and condition data is derived from regular inspections performed in accordance with the National Bridge Inspection Standards and collected in VDOT’s Bridge Management System. This data is used to determine a set of bridge needs which are prioritized based on long-term objectives defined in the TAMP. VDOT’s 2021 TAMP was approved by FHWA in August 2022 and will be used in coordination with the findings of the Comprehensive Review to guide investment strategies to reach long-term goals.

VDOT expects the percentage of good deck area on the NHS to decrease during this performance period, which is reflected in the two-year and four-year performance targets. These targets are appropriate given available funding, the age and condition of the inventory, and the need to minimize life-cycle costs. Stewardship of the bridge inventory will require Virginia to be strategic in implementing the most cost-effective interventions on its bridges. For example, replacements of bridges and bridge components will only be completed, when necessary, while most investments will focus on rehabilitating and preserving existing structures to make the best and more effective use of public funds.

Measure	Baseline Performance (2021)	Desired Direction	2-year target (2023)	4-year target (2025)
NBI NHS Bridge Deck Area in Good Condition	29.9%	↑	27.2%	25.1%
NBI NHS Bridge Deck Area in Poor Condition	3.0%	↓	3.3%	3.6%

System Performance

The PM3 rule established six performance measures to assess person and freight travel reliability on the Interstate and non-Interstate NHS, and traffic congestion and on-road mobile source emission reductions in areas that do not meet federal air quality standards:

1. Percentage of person-miles on the Interstate system that are reliable
2. Percentage of person-miles on the non-Interstate NHS that are reliable
3. Truck Travel Time Reliability Index (TTTR)
4. Annual hours of peak hour excessive delay per capita (PHED)
5. Percentage of non-single occupant vehicle travel (non-SOV)
6. Cumulative two-year and four-year reduction of on-road mobile source emissions for CMAQ funded projects (CMAQ Emission Reduction)

The first two measures are expressed as the percentage of person-miles traveled, thereby considering the number of people traveling in buses, cars, and trucks. The third measure assesses reliability for trucks traveling on the Interstate system and is expressed as an index. The higher the index the lower the reliability. Travel is reliable when the time it takes to travel along a corridor or system is usually consistent from day to day for similar time periods. Travel is unreliable when trips frequently experience travel times that are significantly longer than normal travel times.¹

PHED measures the hours of delay resulting from traffic congestion on the NHS during morning and afternoon peak travel times.² Non-SOV travel measures travel that occurs by any mode other than driving alone in a motorized vehicle, such as carpool, vanpool, public transportation, commuter rail, walking, bicycling and telecommuting. The CMAQ Emission Reduction measure assesses the cumulative emission reductions resulting from implementation of projects funded by the Congestion Mitigation and Air Quality (CMAQ) Improvement Program. In Virginia, the PHED, non-SOV, and CMAQ Emission Reduction measures apply only to the Northern Virginia portion of the Washington, DC-VA-MD urbanized area.

Travel Time Reliability on the Interstate and Non-Interstate NHS

Virginia's travel time reliability target setting approach considers a number of factors such as anticipated growth in vehicle miles traveled, major capital projects that may impact reliability, highway crash patterns, and impact of ongoing operational and system management strategies. VDOT also continues to evaluate reliability performance measures and methods to predict future performance on both the interstate and non-interstate NHS. These evaluations concluded that reliability on both the interstate and non-interstate NHS during this performance period will decline relative to 2021 baseline conditions, while also considering that the use of 2021 baseline performance data may not be fully indicative of post COVID-19 pandemic travel patterns. The two-year and four-year targets reflect this potential decline, while still showing an improvement from the observed reliability prior to 2020.

Virginia conducts a data-driven approach to identify needs on the interstates and non-interstate NHS through VTrans. Proposed projects to address VTrans needs are scored through Virginia's project prioritization process, SMART SCALE, or are funded through other unique federal and state funding programs. For example, through the Interstate Operations and Enhancement Program (IOEP), each interstate corridor has been studied to identify needs intended to improve the safety, reliability, and travel flow along the interstate corridors in Virginia. Solutions to the needs are evaluated, focusing on improving traffic management, addressing recurring and non-recurring congestion, and deploying low-cost improvements to optimize existing roadway capacity. Proposed projects resulting from the IOEP are also prioritized and scored using a similar methodology as SMART SCALE.

¹ The first two measures use Level of Travel Time Reliability (LOTRR), which is defined as the ratio of the 80th percentile travel time on a travel segment to a "normal" travel time (50th percentile). The TTTR ratio is generated by dividing the 95th percentile time by the normal time (50th percentile) for each travel segment.

² The threshold for excessive delay is based on the travel time at 20 miles per hour or 60% of the posted speed limit, whichever is greater. This measure is expressed as total per-capita delay during all weekday peak hours over the course of a full calendar year.

Approximately \$3 billion in SMART SCALE funding and more than \$1.5 billion in IOEP funds are anticipated during this performance period. The CTB utilizes the scored projects to make its funding decisions for inclusion in the Six-Year Improvement Program (SYIP). These efforts link project investment decisions and performance-based planning and programming.

Virginia’s focus on reliability performance measures and target setting is increasing our understanding of the performance measures and those factors which have an impact on reliability and could lead to improved performance. Along with a long-term focus on improved efficiencies, Virginia is conducting work in support of the national long-term goals and improved performance-based planning and programming.

Measure	Baseline Performance (2021)	Desired Direction	2-year target (2023)	4-year target (2025)
Interstate Travel Time Reliability (% of person miles traveled that are reliable)	86.3%	↑	85.0%	85.0%
Non-Interstate NHS Travel Time Reliability (% of person miles traveled that are reliable)	95.0%	↑	88.0%	88.0%

Interstate Truck Travel Time Reliability Index

The two-year and four-year performance targets established for the 2022-2025 performance period reflect the goals and objectives incorporated into both short-term and long-range planning documents such as the SYIP and Virginia’s State Freight Plan (VTrans Freight Element).

Based on future volume increases, economic growth, and near-term work-zone and construction plans and schedules, it is forecasted that the truck travel time reliability (TTTR) index will gradually increase. VDOT expects that it will be difficult to achieve a lower TTTR index in 2023 and 2025 when compared to the baseline (2021). This is consistent with trends analyzed in VTrans and the VTrans Freight Element planning documents. However, VDOT anticipates that current and future projects identified in the SYIP will show benefits to interstate truck travel reliability in the long term (short-term impacts due to construction and work-zones may negatively impact performance).

Measure	Baseline Performance (2021)	Desired Direction	2-year target (2023)	4-year target (2025)
Truck Travel Time Reliability Index (Interstates)	1.49	↓	1.64	1.64

Annual Peak Hours of Excessive Delay per Capita (Northern Virginia)

Coordination across multiple states supports development of the FHWA required targets for annual peak hours of excessive delay (PHED) per capita for the Washington, DC-MD-VA urbanized area (UZA). Three state DOTs and the Transportation Planning Board (TPB) (the MPO for the metropolitan Washington region) participated in developing performance forecasts. The four-year PHED target for the Washington, DC-MD-VA UZA was reflective of anticipated continued population and job growth in the region, as well as the completion of significant public transportation and road infrastructure projects. .

The TPB's Visualize 2045 long range metropolitan transportation plan for the National Capital Region (Washington DC-MD-VA UZA) was recently adopted in June 2022. Expectations for growth in the region and the impacts of projects, programs and policies on travel and traffic congestion are described in the Plan. The targets for 2023 and 2025 anticipate a potential return to pre-pandemic traffic delay levels, although uncertainty remains as to the continuing impacts of widespread telework and flexible work schedules.

Measure	Baseline Performance (2021)	Desired Direction	2-year target (2023)	4-year target (2025)
Annual Peak Hours of Excessive Delay per Capita	12.8	↓	22.5	22.7

Non-Single Occupancy Vehicle Mode Share (Northern Virginia)

State DOT and MPO representatives of the Washington, DC-MD-VA urbanized area selected the American Community Survey as the method for setting non-SOV performance targets. The regional planning partners worked in coordination to forecast future mode share changes using the TPB regional travel demand model which considers near term-predicted changes in population, employment and other factors that increase travel demand, as well as changes in the highway and transit network, which increase travel options and impact travel time. The same assumptions supporting the PHED targets are used for the non-SOV targets.

Measure	Baseline Performance (2021)	Desired Direction	2-year target (2023)	4-year target (2025)
Non-Single Occupancy Vehicle Mode Share	39.5%	↑	37.4	37.7

Congestion Mitigation and Air Quality (CMAQ) Program Emission Reductions (Northern Virginia)

The CMAQ emissions reduction targets are reflective of the anticipated emission reductions from all CMAQ projects currently programmed in the Virginia portion of the National Capital Region Transportation Planning Board transportation improvement programs (TIPs) covering FY 2022-2025. The CMAQ Emission Reduction performance measures have led to new priorities for use of CMAQ funds which contribute to enhanced congestion reduction. Projects focused on bicycle and pedestrian networks, transit service, and signal synchronization provide alternatives to driving alone while also reducing congestion.

Measure	Baseline Performance (cumulative, 2018-2021)	Desired Direction	2-year target (2023)	4-year target (2025)
The 2-year and 4-year cumulative emissions reduction of NOx (total daily kilograms)	10.894	↑	0.612	4.911
The 2-year and 4-year cumulative emissions reductions of VOC (total daily kilograms)	7.884	↑	0.323	3.013

Conclusion

This report documents Virginia's 2021 performance and anticipated performance and targets for the Federal pavement, bridge, and system performance measures at the beginning of the 2022 – 2025 performance period. OIPI, VDOT, and other statewide and regional planning partners have advanced performance management practices since the initiation of the federally required process in 2017. These advancements, including new data management tools, predictive models, and investment policy are enhancing agency capabilities in establishing data-driven performance targets and committing resources to address performance gaps.

- **Interstate and non-interstate NHS pavement** in good condition is anticipated to decrease over the next four years as VDOT implements an asset management approach focused on proactive maintenance to extend all asset lifecycles, including Virginia's extensive VDOT maintained highway system. At the same time, as a result of these proactive practices, less than 1 percent of all NHS pavements (interstate and non-interstate) are anticipated to be in poor condition over the next four years.
- **NHS bridges** in good condition are anticipated to decrease steadily over the next 10 years consistent with available funding, the age and condition of the bridge inventory, and the need to minimize life-cycle costs across the entire inventory (including non-NHS bridges). Bridges in poor condition are anticipated to remain in the 3 to 4 percent range over the next four years. Stewardship of the bridge inventory will require Virginia to be strategic in implementing the most cost-effective interventions on its bridges.
- **Travel time reliability** (measured through the percent of reliable person miles traveled) on the interstate system and the non-Interstate NHS is anticipated to slightly decline over the next four years (particularly in comparison to a higher level of performance in 2021 still impacted by changed travel patterns due to the pandemic). However, performance estimates over the next four years reflect that Virginia's NHS will maintain travel time reliability levels better than pre-pandemic performance trends.
- **Truck travel time reliability** (measured through the truck travel time reliability index) is anticipated to see worsening performance over the next four years due to continued truck volume increases, overall economic growth, and near-term work-zone and construction plans and schedules. VDOT expects that it will be difficult to achieve a lower TTTR index over the next four years compared to 2021. VDOT does anticipate that current and future projects identified in the SYIP will show benefits to interstate truck travel reliability in the long term.
- **Delay, non-SOV mode share, and CMAQ project emission reduction** measures are only applicable in the Northern Virginia portion of the Metropolitan Washington D.C. region. Peak hours of excessive delay are anticipated to increase over the next four years assuming that commuting patterns return closer to pre-pandemic levels. As a result, non-SOV mode share is anticipated to continue to remain at levels slightly above pre-pandemic levels, also in part due to planned transit and non-motorized investments. VDOT, in cooperation with neighboring states and the Transportation Planning Board continues to prioritize CMAQ investments to support improved alternative to driving alone and congestion reduction strategies.

Virginia will monitor and report performance on a regular basis through existing data tools and models, and in 2024 have an opportunity to review mid-period performance through 2023 and reconsider 2025 targets, as necessary.