

# DRAFT

# 2050 MTP

## Appendix A: System Performance Report

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# Introduction

The 2012 Moving Ahead for Progress in the 21st Century (MAP-21) and the 2015 Fixing America's Surface Transportation Act (FAST Act) established performance and outcome-based programs to direct state-level investment of federal funds toward projects that support progress towards seven national transportation goals. The 2021 Infrastructure and Investment Jobs Act (IIJA) continues this transportation performance management.

## Seven National Transportation Goals

1. **Safety:** To achieve a reduction in fatalities and serious injuries on all public roads.
2. **Infrastructure Condition:** To maintain highway infrastructure assets in a state of good repair.
3. **Congestion Reduction:** To achieve a reduction in congestion on the National Highway System (NHS).
4. **System Reliability:** To improve the efficiency of the surface transportation system.
5. **Freight Movement and Economic Vitality:** To improve freight networks, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
6. **Environmental Sustainability:** To enhance the performance of the transportation system while protecting and enhancing the environment.
7. **Reduced Project Delivery Delays:** To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

The U.S. Department of Transportation (USDOT) Federal Highway and Transit administrations (FHWA and FTA, respectively) requires performance-based planning and programming for state departments of transportation (DOTs), metropolitan planning organizations (MPOs), and public transportation providers, including performance-based program data requirements, measures, metrics, thresholds, and methods for calculating baseline and predicted condition/performance (targets), performance periods, target reporting and adjustment, and federal assessment of progress achieved.

State long-range transportation plans are required to include a system performance report (SPR) and subsequent updates evaluating the condition and performance of the transportation system with respect to the performance targets described in §450.206(c), including progress achieved by the MPO(s) in meeting the performance targets in comparison with system performance recorded in previous reports. (23 CFR §450.216(f))

Furthermore, 23 CFR §450.206(c)(4) requires integration of transit asset management performance measures and targets as required by Title 49 CFR, Chapter 53, Public Transportation. This system performance report focuses on national performance program measures, reflecting current conditions and targets for the respective performance period.

# Maryland Transportation Performance Management

The Maryland Department of Transportation (MDOT) has a long history of measuring progress towards state level goals and objectives through its annual [Attainment Report on Transportation System Performance](#) (AR), mandated through [Transportation Article 2-102.1\(j\)](#). Through its statewide long range transportation plan, the 2050 Maryland Transportation Plan (2050 MTP), MDOT has developed goals and guiding principles to guide MDOT's decision-making. Several of these guiding principles and goals are aligned with the federal performance measures for safety, asset condition, and system performance (Table 1). This document describes:

- the federal performance measures in Maryland;
- the alignment with the 2050 MTP guiding principles and goals;
- the most recently reported federal performance measure baseline values, associated targets, significant progress determination, and updated target; and
- the next steps for MDOT and partners to achieve the federal targets.

*Table 1. Federal Performance Area Alignment with 2050 MTP Guiding Principles and Goals*

| Performance Area         | 2050 MTP Guiding Principles                                                                                                                          | 2050 MTP Goals                                                                                                                                                                          |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Safety                   |                                                                                                                                                      | <b>Enhance Safety and Security</b><br>Protect the safety and security of all residents, workers, and visitors.                                                                          |
| Infrastructure Condition | <b>Preservation</b><br>Preserve the condition of the existing transportation system assets to provide safe and efficient movement.                   | <b>Deliver System Quality</b><br>Deliver a reliable, high-quality, integrated transportation system.                                                                                    |
|                          |                                                                                                                                                      | <b>Promote Environmental Stewardship</b><br>Minimize and mitigate the environmental effects of transportation.                                                                          |
| System Performance       | <b>Experience</b><br>Improve the experience of all transportation system users.                                                                      | <b>Serve Communities and Support the Economy</b><br>Expand transportation options to allow Maryland's diverse communities to access opportunities and to support the movement of goods. |
|                          | <b>Resilience</b><br>Improve the transportation system's ability to provide reliable service throughout natural weather events and man-made threats. | <b>Deliver System Quality</b><br>Deliver a reliable, high-quality, integrated transportation system.                                                                                    |

MDOT collaborates with partners for each of the federal performance areas of safety, asset condition, emissions, congest, reliability, and transit asset management to set federally required transportation performance targets. MDOT uses data-informed projections and stakeholder engagement to inform the target-setting process for each of the performance areas. MDOT and Maryland's Metropolitan Planning Organizations (MPOs) meet several times to coordinate the overall approach to setting targets and understand how projects in MPO areas might impact performance on federal performance measures.

# Maryland System Performance Report

## Safety

Safety performance is assessed annually on all public roads, regardless of ownership or roadway classification. There are five performance measures for which states and MPOs must establish targets and assess performance:

1. Number of Fatalities
2. Rate of Fatalities per 100 million Vehicle Miles Traveled (VMT)
3. Number of Serious Injuries
4. Rate of Serious Injuries per 100 million VMT
5. Number of Non-motorized Fatalities and Non-motorized Serious Injuries

All safety performance measures are calculated as a five-year rolling average of annual performance results for the five most recent calendar years. MDOT reports the federal safety performance measures and targets to FHWA through the annual Highway Safety Improvement Program (HSIP) report.

## Targets

MDOT set safety targets through deep engagement with experts and partners, including government agencies, education and outreach professionals, local law enforcement and emergency services agencies as part of its Strategic Highway Safety Plan and under the umbrella of "Zero Deaths Maryland" strategies. The State Highway Administration (SHA) works closely with the Maryland Highway Safety Office (MHSO), the Maryland Transportation Authority (MDTA), and the Maryland Institute for Emergency Medical Services in the development of the annual HSIP. MDOT most recently reported safety performance and targets in the 2021 HSIP.

MDOT set targets for its federal safety performance measures using the following two-pronged methodology:

- Using an exponential trend line for performance measures that are experiencing a decreasing trend over time. An exponential trend line shows the compounding change over time.
- Using a 2 percent decrease for each successive five-year rolling average value over time for those experiencing an increasing trend over time.

## Performance

In 2020, Maryland did not meet any of its five federal safety targets and was not determined to have made significant progress over its baseline performance (Table 2). Safety is a priority for MDOT and is featured in an MTP 2050 goal.

| 2050 MTP Goal                                                                   |
|---------------------------------------------------------------------------------|
| <b><i>Enhance Safety and Security</i></b>                                       |
| <i>Protect the safety and security of all residents, workers, and visitors.</i> |

Table 2. Safety Performance Measures and Targets

| Federal Performance Measure                          | How It's Measured                                                                   | 2020 Outcome | 2020 Target | Achieved Target or Made Significant Progress? | 2022 Target |
|------------------------------------------------------|-------------------------------------------------------------------------------------|--------------|-------------|-----------------------------------------------|-------------|
| <b>Fatalities</b>                                    | Number of fatalities (five-year rolling average)                                    | 537.2        | 425.7       | No                                            | 466.6       |
| <b>Fatality rate</b>                                 | Number of fatalities per 100 million VMT (five-year rolling average)                | 0.935        | 0.750       | No                                            | 0.774       |
| <b>Serious injuries</b>                              | Number of serious injuries (five-year rolling average)                              | 3,115.2      | 3,029.4     | No                                            | 2263.9      |
| <b>Serious injury rate</b>                           | Number of serious injuries per 100 million VMT (five-year rolling average)          | 5.385        | 5.372       | No                                            | 3.815       |
| <b>Non-motorized fatalities and serious injuries</b> | Number of non-motorized fatalities and serious injuries (five-year rolling average) | 635.2        | 465.8       | No                                            | 554.7       |

## Next Steps

In addition to being addressed in the 2050 MTP goals, objectives, and strategies, MDOT will work to make significant progress towards meeting its future safety target through its 2021-2025 Strategic Highway Safety Plan (SHSP). MDOT and its partners identified six safety emphasis areas (EA) and developed action plans to improve safety for each EA and improve performance towards MDOT's safety targets. The six safety emphasis areas are:

- Distracted driving
- Impaired driving
- Infrastructure
- Occupant protection
- Pedestrians and bicyclists
- Speed & aggressive driving

Zero Deaths Maryland incorporates principles and data-driven strategies from proven safety programs such as Vision Zero and others to "provide a broad systems perspective that considers the interaction of the road user with the road design as a necessary component to achieve zero deaths on our roads." Zero Deaths Maryland uses a data-driven and interdisciplinary strategy that applies education, enforcement, engineering, and emergency medical services strategies to prevent fatal and severe crashes. The Zero Deaths Maryland strategy emphasizes a broad systems perspective that considers the interaction of the road user with the roadway infrastructure as a necessary component to achieve zero deaths.<sup>1</sup>

Each EA's action plan is unique (as detailed in MDOT's SHSP) but all action plans include multipronged strategies under the following categories to support improved safety performance:

- Data
- Enforcement
- Infrastructure
- Legislation
- Outreach
- Vehicle engineering and technology

MDOT is committed to working with its partners in safety including MHSO, SHA, MDTA, the Maryland Institute for Emergency Medical Services, local law enforcement, and MPOs to make significant progress toward its federal safety targets and work toward the long-term Vision Zero goal. MDOT will review and potentially update the target-setting process in the 2022 HSIP to align with MDOT investment strategies and the Vision Zero long-term goal

## Infrastructure Condition

Infrastructure condition comprises performance measures for both bridges and pavements on the National Highway System (NHS). State DOTs and MPOs establish targets every two years, which are reported to FHWA via Biennial Performance Reports. There are six performance measures to assess highway infrastructure condition:

1. Percent of NHS bridges by deck area classified as in Good condition
2. Percent of NHS bridges by deck area classified as in Poor condition
3. Percent of Interstate pavements in Good condition
4. Percent of Interstate pavements in Poor condition
5. Percent of non-Interstate NHS pavements in Good condition
6. Percent of non-Interstate NHS pavements in Poor condition

<sup>1</sup> [https://zerodeathsmd.gov/wp-content/uploads/2021/06/2021\\_2025\\_MD\\_SHSP\\_FINAL.pdf](https://zerodeathsmd.gov/wp-content/uploads/2021/06/2021_2025_MD_SHSP_FINAL.pdf)



## Targets

MDOT developed pavement condition targets based on currently programmed projects, expected funding, and performance projection modeling. These targets are consistent with the Maryland Transportation Asset Management Plan (TAMP) and its financial plan, investment strategies, and pavement management system performance forecasts. The pavement condition targets are documented in the 2022 Maryland TAMP for NHS bridge and pavement assets, which is a risk-based plan documenting NHS owners' short-, medium- and long-term state of good repair performance goals, current and future asset management strategies including a 10-year investment plan to achieve that performance. The Maryland TAMP also identifies the risks to the system and the financial gap between current funding levels and what is needed to achieve the long-term performance goal. While these targets are based on a forecasted small decline in performance, they reflect MDOT's commitment to maintaining pavement assets in an overall state of good condition. Poor condition roads on the Interstate system in Maryland have historically been kept well below the minimum condition threshold of 5 percent, which is expected to continue. Fluctuation in the amount of pavement rated as "Good Condition" is expected as part of the life cycle plan outlined in the Maryland TAMP, in line with investment strategies that consider the total costs over the life of the asset.

MDOT and its partners have established realistic near-term targets for NHS bridge condition based on reasonably available estimated funding, currently programmed projects, and outputs from MDOT's bridge management system and deterioration models. Maryland is consistently below the federal minimum condition threshold for poor-rated bridges and anticipates that will continue.

## Performance

MDOT achieved four of its six asset condition performance measure targets for 2021, including interstate pavement condition and non-interstate National Highway System (NHS) pavement condition (Table 3). However, MDOT did not meet or make significant progress towards the two federal bridge condition targets. Preservation is one of the 2050 MTP's guiding principles across all goal areas:

### 2050 MTP Guiding Principle

***Preservation:*** *Preserve the condition of the existing transportation system assets to provide safe and efficient movement.*

MDOT prioritizes bridge and pavement investments which prevent assets from falling into poor condition in alignment with investment strategies and life cycle analyses developed through Maryland's TAMP, which represents all NHS assets regardless of ownership including federal, state, and local partner owner agencies.

During the most recent performance period MDOT prioritized investing in pavement preventive maintenance to extend the service life of pavements at relatively low cost, such as crack sealing and micro surfacing. MDOT partners with other NHS owners to maintain conditions on NHS roadways; however, MDOT does not have authority over the investment decisions of federal and local partner owner agencies.

MDOT is proud of the fact that only 1.1 percent of deck area maintained by the agency is in poor condition, which is one of the lowest in the country. MDOT plans and programs bridge projects that are necessary to maintain the system of bridges and culverts in an overall state of good repair and assists partner NHS structure owners to identify and execute investment strategies that maintain individual bridges in a state of good repair (state of good repair may include bridges defined as both good and fair by federal definitions.) However, local partner owners of NHS bridge assets must meet all transportation infrastructure needs, of which their NHS assets are only a small share, with limited funding.

The COVID-19 pandemic led to a transportation budget shortfall starting in FY 2020 and through FY 2021 for all of Maryland's NHS partner owners. This led to a decline in revenues and available capital funds for bridge investment. As a result, many programmed projects that would have improved poor condition or fair condition bridges to good condition were delayed. Instead, focus was put on investments to prevent an increase in the amount of poor deck area, which is the primary interest of Maryland's NHS owners.

Table 3. Asset Condition Performance Measures and Targets

| Federal Performance Measures | How It's Measured                                  | 2021 Outcome | 2021 Target | Achieved Target or Made Significant Progress?                                         | 2023 Target |
|------------------------------|----------------------------------------------------|--------------|-------------|---------------------------------------------------------------------------------------|-------------|
| Pavement condition           | % of interstate pavement in good condition         | 55.4         | 50.0        |   | 48.0        |
|                              | % of interstate pavement in poor condition         | 0.6          | 2.0         |  | 1.0         |
| Pavement condition           | % of non-interstate NHS pavement in good condition | 30.4         | 30.0        |  | 29.0        |
|                              | % of non-interstate NHS pavement in poor condition | 6.2          | 8.0         |  | 8.0         |
| Bridge condition             | % of NHS deck area in good condition               | 24.7         | 28.4        | No                                                                                    | 24.5        |
|                              | % of NHS deck area in poor condition               | 2.5          | 2.4         | No                                                                                    | 2.5         |

## Next Steps

In addition to being addressed in the 2050 MTP goals, objectives, and strategies, MDOT will work to make significant progress towards meeting its future pavement and bridge condition targets through the implementation of the Maryland TAMP. MDOT and FHWA track the progress toward implementation of the Maryland TAMP through annual Consistency Determination Reviews, in which MDOT and partner owners report on the status of completing programmed projects and investments aimed at improving pavement and bridge condition.

MDOT will continue to support other NHS partner owners to navigate these challenges and apply sound asset management principles on their portions of the NHS, provide them with relevant data, and support the development of local bridge plans to achieve improved performance.

## Reliability

The U.S. Department of Transportation (USDOT) defines reliability as “the degree of certainty and predictability in travel times on the transportation system.” It is related to congestion, in that congestion is a cause of unreliable travel, but the focus is on identifying locations with high unpredictability. There are three performance measures that assess reliability:

1. Percent of person-miles on the Interstate System that are reliable
2. Percent of person-miles on the non-Interstate NHS that are reliable
3. Truck Travel Time Reliability Index

State DOTs and MPOs establish reliability targets every two years, which are reported to FHWA via Biennial Performance Reports. Travel time reliability for all road users is assessed for the entire NHS, while truck travel time reliability is assessed only for the Interstate system.

## Targets

Maryland, like the rest of the nation, experienced drastic decreases in vehicles on the roads during the pandemic in 2020 and some of 2021. Traffic levels are now beginning to increase back to pre-pandemic levels. MDOT acknowledges that in the long-term, Maryland's roads are unlikely to remain as reliable as they have been in 2020 and 2021 as travelers return to the roadways post-pandemic. However, MDOT assumed in development of targets that some of the positive reliability performance experienced recently will continue.

The 2- and 4-year targets MDOT established are more ambitious than those established in the first performance period, and Maryland NHS owners will attempt to keep the improved reliability currently observed and extend into the 2022-2025 performance period, in line with expected population and VMT growth. Maryland adjusted its approach to reliability target setting from the first performance period to combine the forecast model results used in the first performance period with pre-COVID target levels.

The locations with the worst reliability have likely shifted and peak periods may have changed, which likely changes the best interventions to achieve improved performance. The analysis that was part of the target setting process will continue in the future to help Maryland NHS owners understand performance-based outcomes and implications of investments.

## Performance

Maryland achieved all of its system performance and reliability targets (Table 4). Reliability and the movement of goods are integral to the 2050 MTP and are featured in two guiding principles and two goals.

| 2050 MTP Guiding Principles                                                                                                                        | 2050 MTP Goals                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Experience:</b> Improve the experience of all transportation system users.                                                                      | <b>Serve Communities and Support the Economy:</b> Expand transportation options to allow Maryland's diverse communities to access opportunities and to support the movement of goods. |
| <b>Resilience:</b> Improve the transportation system's ability to provide reliable service throughout natural weather events and man-made threats. | <b>Deliver System Quality:</b> Deliver a reliable, high-quality, integrated transportation system.                                                                                    |

The COVID-19 pandemic impacted travel volumes and driver behavior in 2020 and 2021 worldwide and in Maryland, which contributed to Maryland meeting or making significant progress toward targets. In addition, Maryland NHS owners made efforts to continue and expand on improving reliability conditions over the performance period. In 2020, MDOT SHA and MDTA Coordinated Highways Action Response Team (CHART) drivers responded to over 70,000 service calls to address motorist incidents.

Table 4. System Performance and Reliability Performance Measures and Targets

| Federal Performance Measures         | How It's Measured                                                   | 2021 Outcome | 2021 Target | Achieved Target or Made Significant Progress?                                         | 2023 Target |
|--------------------------------------|---------------------------------------------------------------------|--------------|-------------|---------------------------------------------------------------------------------------|-------------|
| <b>Travel time reliability</b>       | % of the person-miles traveled on interstate that are reliable      | 84.7         | 72.1        |  | 76.8        |
| <b>Travel time reliability</b>       | % of the non-interstate NHS person-miles traveled that are reliable | 92.4         | 82.0        |  | 87.2        |
| <b>Truck travel time reliability</b> | Truck travel time reliability index                                 | 1.60         | 1.88        |  | 1.80        |

## Next Steps

In addition to the objectives and strategies identified in the 2050 MTP, MDOT currently has a number of initiatives to improve reliability on the NHS. Going forward, MDOT will carefully monitor congestion and reliability trends to strategically invest in freight corridors and highway networks. As Maryland travel begins to go back to relatively normal conditions, Maryland will focus on data and performance-driven capital and operational technology investments.

MDOT continues to build new resources using truck probe data to understand freight mobility dynamics and the impact of delay on key Maryland supply chains. These efforts will help Maryland to achieve its long-term goal of improving the National Highway Freight Network because understanding of the monthly trends and causes of performance results allows MDOT and NHS partner owners to make timely decisions about which locations and bottlenecks need to be addressed and how.

CHART is installing advanced transportation management system (ATMS) and advanced traffic information system (ATIS) technologies on interstate highways and arterials statewide, including cameras, traffic detectors, weather sensors, dynamic message signs (DMS), highway advisory radios (HAR), websites, and telecommunication networks.

## Congestion

Congestion performance is managed as part of the Congestion Mitigation and Air Quality (CMAQ) program. State targets for applicable agencies are established every two years and reported to FHWA via the Biennial Performance Report. There are two performance measures for traffic congestion:

1. Annual hours of peak hour excessive delay per capita
2. Percent of non-single occupancy vehicle travel

Congestion performance is assessed only at the level of Census-defined urbanized areas (UZAs); there are no state-level targets or performance reporting. The measures apply only to UZAs with populations above 200,000 and that have NHS mileage within an EPA-designated nonattainment or maintenance area for nitrogen oxide (NOx), volatile organic compounds (VOC), carbon monoxide (CO), or particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>).

All state DOTs and MPOs whose boundaries include part of the applicable UZA must coordinate to agree on a single, unified target for the UZA. MDOT is required to participate in setting congestion targets for four UZAs:

- Aberdeen, MD
- Baltimore, MD
- Philadelphia, PA
- Washington, DC

## Targets: Peak-Hour Excessive Delay

The specific approaches for each UZA's peak-hour excessive delay targets are summarized below.

### *Aberdeen*

Aberdeen developed its initial targets as a new UZA using the existing Peak Hours of Excessive Delay (PHED), calculated through data from the Regional Integrated Transportation Information System (RITIS) tool, and then projecting future delay. The year 2020 was omitted from these calculations to account for the atypical transportation patterns due to the COVID-19 pandemic. Both the 2- and 4-year targets were established to maintain 2021 congestion.

### *Baltimore*

Baltimore has set increasing targets to reflect the assumption that delays will likely increase slowly into the near future as travel volumes recover from the COVID-19, despite work the MPO is planning to address it. This targeted performance level acknowledges the reality of growth that can lead to more congestion while aspiring to maintain the improvements experienced from travel behavior changes during the pandemic and contribute to long-term performance improvements. This assumption is in line with expectations in the region's long range transportation plan, Maximize 2045, which estimates that population and VMT will both continue to increase over the long-term and add to congested conditions. The Baltimore Metropolitan Council (BMC) and MDOT will implement strategies outlined in BMC's congestion management process (CMP) and MDOT Transportation Systems Management and Operations (TSMO) strategic and master plans.

### *Philadelphia*

Philadelphia's target setting supports the Delaware Valley Regional Planning Commission (DVRPC) 2050 Long-Range Plan and the DOT's transportation goals of increasing mobility and reliability while reducing congestion and person vehicle miles traveled. DVRPC will continue to promote and develop projects and programs to its counties and planning partners to reduce excessive delay and invest in projects with air quality benefits. As part of DVRPC's Congestion Management Process, it facilitates a Planning Advisory Committee and generates a list of the top congested corridors and bottlenecks for most roadways, including all NHS roadways, and identifies multimodal strategies for mitigating traffic congestion.

### *Washington, DC*

Washington DC's performance targets are in line with previously documented trends; over the past few decades, the National Capital Region's healthy economy has fueled consistently strong population and job growth, and that trend is expected to continue well into the future. Where and how the region grows impacts the transportation options, congestion levels, and quality of life for the people in the region. Increases in congestion are expected in the long term; however, the region aims to keep congestion from growth in check via funding projects that prioritize land uses that bring together jobs, housing, services, and recreation in a walkable environment served by transit.

## Targets: Non-SOV Travel

The specific approaches for each UZA's non-SOV targets are summarized below.

### *Aberdeen*

Targets were developed by using the existing non-SOV, calculated utilizing ACS 5-year data, and forecasting trend lines for the second performance period. For the Aberdeen Urbanized Area, trends have remained relatively flat over a long period of time. Because of this and the fact that it is a new area for this performance analysis, the agencies decided to set the target to maintain current non-SOV travel levels.

### *Baltimore*

For the Baltimore Urbanized Area, two trend lines were forecasted: (1) a long-term trend based on data ranging from 2010 to 2019 and (2) a near-term trend based on data ranging from 2015 to 2019. The average was then taken from the 2- and 4-year data points on these trend lines to develop the 2- and 4-year targets respectively. This was done because the near-term trend taken alone indicated a slight improvement in performance, but there was uncertainty around how much of the pandemic effects on transit use and work from home will continue. Therefore, the decision was made to also look at longer-term trends.

### *Philadelphia*

Targets were established in part based on past performance and trending through the performance period. There was a slight increase in percent non-SOV travel from 2010 through 2019 and then a more substantial increase in 2020 due in large part to increases in people working from home during COVID. Other factors considered were past population, employment, and transit ridership trends, and best available information on future travel patterns based on percentage of workers that might work from home, take transit, and drive alone. Future projects that were anticipated to be completed in the performance period that might "move the needle" on the measures were also considered. Based on these considerations, the Philadelphia MPO and its partners agreed on a slight decrease from the baseline of 30.6, with 2-year and 4-year targets both at 30.0 percent.

### *Washington, DC*

For forecasting for the new four-year performance period, TPB staff decided to use methodologies similar to that for the previous performance period. The Mode Share (Non-SOV) target was forecast using only the trendline.

## Performance

Congestion reduction aligns with the 2050 MTP multiple goal related to mobility of people and goods.

### 2050 MTP Goals

***Serve Communities and Support the Economy:*** Expand transportation options to allow Maryland's diverse communities to access opportunities and to support the movement of goods.



The Baltimore, Philadelphia, and Washington DC UZA achieved or made significant progress toward all of their applicable congestion targets (Table 5). Aberdeen is a new UZA as of this reporting period and as such reports 2021 baseline and 2023 targets, but no determination of achievement or significant progress was made. Maryland also exceeded its statewide emissions reduction targets (Table 6).

Table 5. UZA Congestion Performance Measures and Targets

| Federal Performance Measures               | How It's Measured                                                                      | 2021 Outcome | 2021 Target | Achieved Target or Made Significant Progress?                                         | 2023 Target |
|--------------------------------------------|----------------------------------------------------------------------------------------|--------------|-------------|---------------------------------------------------------------------------------------|-------------|
| <b>Peak Hour Excessive Delay (PHED)</b>    | Annual hours of PHED per capita<br><i>Aberdeen – Bel Air South – Bel Air North, MD</i> | 6.9          | n/a         | n/a                                                                                   | 6.9         |
|                                            | Annual hours of PHED per capita<br><i>Baltimore, MD</i>                                | 13.9         | 22.6        |    | 14.8        |
|                                            | Annual hours of PHED per capita<br><i>Philadelphia, PA-NJ-DE-MD</i>                    | 13.1         | 17.2        |    | 15.2        |
|                                            | Annual hours of PHED per capita<br><i>Washington, DC-VA-MD</i>                         | 13.1         | 26.7        |  | 22.5        |
| <b>Non-Single Occupancy Vehicles (SOV)</b> | Percent of non-SOV<br><i>Aberdeen – Bel Air South – Bel Air North, MD</i>              | 17.8         | n/a         | n/a                                                                                   | 16.8        |
|                                            | Percent of non-SOV<br><i>Baltimore, MD</i>                                             | 27.1         | 24.8        |  | 25.3        |
|                                            | Percent of non-SOV<br><i>Philadelphia, PA-NJ-DE-MD</i>                                 | 30.6         | 28.1        |  | 30.0        |
|                                            | Percent of non-SOV<br><i>Washington, DC-VA-MD</i>                                      | 39.5         | 37.2        |  | 37.4        |

## Next Steps

Through the implementation of the 2050 MTP strategies, MDOT will work toward continuing to reduce congestion across the state and reduce associated transportation related emissions. MDOT continues to collaborate and support the policies and recommendations identified by the Zero Emission Electric Vehicle Infrastructure Council (ZEEVIC).



## Emissions

Emissions performance is also managed as part of the CMAQ program. Only states and MPOs with projects funded through the CMAQ program for being in an EPA-designated nonattainment or maintenance area are required to set targets and track performance for emissions. State targets for applicable agencies are established every two years and reported to FHWA via the Biennial Performance Report. There is one measure to assess emissions performance:

1. Total Emissions Reduction

## Targets

Through management of the CMAQ program, MDOT also collaborates closely with MPOs that cover the UZAs in nonattainment to establish relevant statewide emissions reduction targets for relevant criteria pollutants reported through the CMAQ Public Access System (PAS) which includes data about specific CMAQ funded projects and the anticipated emissions benefits of those projects.

## Performance

Emissions reduction aligns with the 2050 MTP goal related to environmental stewardship.

### 2050 MTP Goals

#### **Promote Environmental Stewardship:**

*Minimize and mitigate the environmental effects of transportation.*

Maryland greatly exceeded its emissions reductions targets and realized emissions benefits during the performance period due to changing travel behavior during COVID-19 pandemic and Maryland's support of ridesharing programs, transit improvements, and congestion reduction measures which helped to improve air quality. Specifically, Maryland adopted "smart" signalization statewide, invested in traffic flow improvements, replaced older transit and mobility buses with clean diesel, and invested in ridesharing projects.

Table 6. Statewide Emission Performance Measures and Targets

| Federal Performance Measures        | How It's Measured            | 2021 Outcome | 2021 Target | Achieved Target or Made Significant Progress?                                         | 2023 Target |
|-------------------------------------|------------------------------|--------------|-------------|---------------------------------------------------------------------------------------|-------------|
| <b>Emissions Reductions for VOC</b> | Emissions Reductions for VOC | 154.718      | 8.129       |  | 1.120       |
| <b>Emissions Reductions for NOx</b> | Emissions Reductions for NOx | 412.872      | 123.961     |  | 8.454       |

## Next Steps

Through the implementation of the 2050 MTP strategies, MDOT will work toward continuing to reduce congestion across the state and reduce associated transportation related emissions. MDOT continues to collaborate and support the policies and recommendations identified by the Zero Emission Electric Vehicle Infrastructure Council (ZEEVIC).

## Transit Asset Management

The Federal Transit Administration (FTA) released its final rule on (Transit Asset Management) TAM on July 26, 2016, which implemented new requirements for recipients and subrecipients of Chapter 53 funds under 49 CFR Parts 625 and 630. Starting from October 1, 2016, the rule mandates FTA grantees to develop and regularly update asset management plans for public transportation assets, ensuring full coverage within a four-year cycle. Additionally, they must establish annual state of good repair (SGR) performance targets and provide new asset inventory module reports to the National Transit Database on a yearly basis.

### Targets

The Maryland transit agencies remain dedicated to improving data quality and business practices. Subject matter experts from the agency actively participate in annual updates to the capital asset inventory, which contribute to the continuous development of the TAM program.

The target-setting process considers historical performance trends, known capital or operating plans, and identified risks to ensure realistic and achievable targets. Data verification and analysis are conducted, calculating baseline performance and future targets based on projected asset inventory and planned investments. These targets undergo further adjustments in response to general trends and stakeholder feedback before receiving approval and confirmation.

### Performance

In 2022, Tier II Local Transit Systems (LOTS) in Maryland achieved their targets for 80 percent of asset types. Specifically, Revenue-Vehicle reached 71 percent, Equipment 50 percent, and Facilities 88 percent of their asset-type targets.

The four Tier I transit agencies in Maryland achieved their asset type targets with MTA reaching 80 percent, WMATA 88 percent, Montgomery County 67 percent, and Prince George's County 60 percent of the targets for all their asset types.

Among the Tier I transit agencies, MTA achieved 89 percent of the targets for the Revenue-Vehicle asset types, WMATA 40 percent, Montgomery County 67 percent, and Prince George's County 33 percent. For Equipment asset types, MTA reached 67 percent of the targets, while both WMATA and Montgomery County achieved 100 percent (Prince George's County reported no Equipment assets). As for the Facilities asset types, MTA reached 75 percent, WMATA 100 percent, Montgomery County 60 percent, and Prince George's County 100 percent of the targets.

The 2050 MTP has a guiding principle and a goal related to transportation system preservation and system quality that are relevant to Transit Asset Management.

| 2050 MTP Guiding Principles                                                                                                             | 2050 MTP Goals                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| <b>Preservation:</b> <i>Preserve the condition of the existing transportation system assets to provide safe and efficient movement.</i> | <b>Deliver System Quality:</b> <i>Deliver a reliable, high-quality, integrated transportation system.</i> |

Maryland's transit agencies conduct annual assessments of physical assets through Transit Asset Management (TAM) plans. These plans inventory assets, establish lifespan benchmarks, evaluate asset condition, and define future condition targets in compliance with the Federal Transit Administration (FTA). Asset condition reporting started in 2018, with target setting commencing in 2019.

Transit agencies establish "useful life benchmarks" (ULB) as the maximum lifespan for each vehicle type and measure the percentage of vehicles exceeding their ULB and set future targets. Facilities are evaluated using the Transit Economic Requirements Model (TERM) Scale (Table 7), ranging from Poor to Excellent on a 5-point scale. Agencies report the percentage of facilities rated below "Adequate" (3) and set future targets.

*Table 7. TERM Rating Scale*

| TERM Rating      | Condition | Description                                                  |
|------------------|-----------|--------------------------------------------------------------|
| <b>Excellent</b> | 4.8-5.0   | No visible defects, near-new condition.                      |
| <b>Good</b>      | 4.0-4.7   | Some slightly defective or deteriorated components.          |
| <b>Adequate</b>  | 3.0-3.9   | Moderately defective or deteriorated components.             |
| <b>Marginal</b>  | 2.0-2.9   | Defective or deteriorated components in need of replacement. |
| <b>Poor</b>      | 1.0-1.9   | Seriously damaged components in need of immediate repair.    |

According to the 2022 Statewide Transportation Improvement Program (STIP), the Maryland Transit Administration (MTA) is a Tier I transit agency that operates and maintains \$10.7 billion in assets to serve over 2.2 million people in Maryland. It provides funding, support, and assistance to 23 Local Transit Systems (LOTS) across the state. MTA updates its Transit Asset Management Plan (TAMP) every four years as required by the FTA. The Office of Local Transit Support oversees Tier II LOTS and updates a group TAMP annually with a major update every four years. MTA and LOTS update performance targets and actuals in the National Transit Database (NTD) each year. As per regulations (49 CFR 625 and 630), MTA measures the performance of four asset categories. These categories and associated measures provide targets and actuals for each measure required by the FTA through the annual NTD reporting process. Targets are determined based on asset information, including condition and planned renewals or replacements.

The FTA-Required Performance Measures by Asset Category are:

- Rolling Stock: Percentage of assets at or past their useful life benchmark (ULB).
- Equipment: Percentage of assets at or past their useful life benchmark.
- Facilities: Percentage of assets rated below condition 3 on TERM scale.
- Guideway: Percentage of directional route miles under performance restrictions.

Relevant vehicle ULBs are noted in Table 8 as reported in the 2022 STIP.

Twenty LOTS participate in the Maryland LOTS Tier II Group TAMP. The Tier II LOTS primarily provide fixed route bus service and demand response service, catering to commuters, the elderly, and individuals with disabilities, facilitating transportation to work centers, medical centers, shopping centers, and recreational centers. Table 8 shows the TAMP performance between outcomes and targets for Tier II LOTS and Tier I transit agencies including MTA, WMATA, Montgomery County, and Prince George's County.

*Table 8. MTA Transit Asset Management Plan ULBs*

| Asset Category                             | Asset Class                           | Default ULB (in years) |
|--------------------------------------------|---------------------------------------|------------------------|
| <b>Rolling Stock</b><br>(Revenue Vehicles) | Articulated Bus                       | 12                     |
|                                            | Automobile                            | 8                      |
|                                            | Over-the-Road Bus                     | 14                     |
|                                            | Bus                                   | 12                     |
|                                            | Cutaway                               | 10                     |
|                                            | Heavy Rail Passenger Car              | 31                     |
|                                            | Light Rail Vehicles                   | 31                     |
|                                            | Minivan                               | 8                      |
|                                            | Commuter Rail Locomotive              | 39                     |
|                                            | Commuter Rail Passenger Coach         | 39                     |
| <b>Equipment</b><br>(Non-Revenue Vehicles) | Automobiles                           | 8                      |
|                                            | Trucks and Other Rubber Tire Vehicles | 7                      |
|                                            | Steel Wheel Vehicles                  | 11                     |

## Next Steps

MDOT will continue to coordinate with Tier II transit agencies across Maryland to develop Group TAM Plan updates. MDOT will work closely with transit agency partners and the Maryland Transit Administration (MTA) to improve the data-driven decision-making for multimodal investments to maintain a state of good repair for transit assets across the state.

## Conclusion

The 2050 MTP is an integrated, performance-based long-range plan which will help guide investment planning and programming decisions across Maryland's transportation network. The MTP, including Maryland's performance on the federal measures described in this system performance report, and Maryland's annual Attainment Report on Transportation System Performance (including Maryland-specific performance measures), help guide which projects MDOT includes and funds through Maryland's six-year Consolidated Transportation Program to support progress towards national and state transportation goals and performance targets.