

visualize
2045 A long-range
transportation plan
for the National
Capital Region

APPENDIX D - UPDATED

System Performance Report

January 2023



National Capital Region
Transportation Planning Board

**SYSTEM PERFORMANCE REPORT FOR THE VISUALIZE 2045 (2022 UPDATE)
LONG-RANGE TRANSPORTATION PLAN
FOR THE NATIONAL CAPITAL REGION**

January 24, 2023

ABOUT VISUALIZE 2045 & THE TPB

Visualize 2045 is the federally required long-range transportation plan for the National Capital Region. It identifies and analyzes all regionally significant transportation investments planned through 2045 to help decision makers and the public “visualize” the region’s future.

Visualize 2045 is developed by the National Capital Region Transportation Planning Board (TPB), the federally designated metropolitan planning organization (MPO) for metropolitan Washington. It is responsible for developing and carrying out a continuing, cooperative, and comprehensive transportation planning process in the metropolitan area. Members of the TPB include representatives of the transportation agencies of the states of Maryland and Virginia and the District of Columbia, 24 local governments, the Washington Metropolitan Area Transit Authority, the Maryland and Virginia General Assemblies, and nonvoting members from the Metropolitan Washington Airports Authority and federal agencies. The TPB is staffed by the Department of Transportation Planning at the Metropolitan Washington Council of Governments (COG).

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SYSTEM PERFORMANCE REPORT

This report summarizes the work of the National Capital Region Transportation Planning Board (TPB), the Metropolitan Planning Organization (MPO) for the Washington, DC metropolitan area, in the field of performance-based planning and programming (PBPP) and the establishment of performance measure targets in accordance with federal requirements. As part of the regional 2022 update to the Visualize 2045 long-range metropolitan transportation plan (LRTP), this system performance report provides an overview of the performance process and targets developed by the TPB in close coordination with the state departments of transportation (DOTs) and providers of public transportation in response to federal requirements for the long-range transportation plan.

This is the second edition of the System Performance Report. The first System Performance Report was approved in October 2018 as [Appendix D of the Visualize 2045 \(2018\) LRTP](#). The System Performance Report is a requirement of Metropolitan Planning Organizations (MPOs) per federal statutes 23 USC 134(i)(2)(C) and 49 USC 5303(i)(2)(C). The MPO is required to prepare a System Performance Report every four years as part of the quadrennial update of the LRTP. The system performance report evaluates the condition and performance of the transportation system with respect to the applicable performance targets in each area: Highway Safety; Highway Assets: Pavement and Bridge Condition; System Performance (Interstate and National Highway System (NHS), Freight Movement on the Interstate System, and the Congestion Mitigation and Air Quality Improvement Program); Transit Asset Management; and Transit Safety.

JANUARY 2023 UPDATE

This document is an updated System Performance Report prepared to include the new actual performance data and the new targets adopted in the latter half of 2022. Contemporaneous with the June 2022 TPB approval of the Visualize 2045 (2022) LRTP and its System Performance Report, data was being collected on actual performance for the first quadrennial performance period of 2018-2021 and new targets were being developed and adopted for the second quadrennial performance period of 2022-2025, in the areas of Highway Assets: Pavement and Bridge Condition; System Performance (Interstate and National Highway System (NHS), Freight Movement on the Interstate System, and the Congestion Mitigation and Air Quality Improvement Program). In addition, new annual targets for highway safety and transit safety were adopted in December 2022. This version of the report fills the gap in time between the LRTP cycle and the PBPP cycle with updated information.

OVERVIEW OF PERFORMANCE-BASED PLANNING AND PROGRAMMING REQUIREMENTS

Under the Moving Ahead for Progress in the 21st Century Act (MAP-21) and reinforced in the Fixing America's Surface Transportation (FAST) Act, federal surface transportation regulations introduced the requirement for implementation of a performance management process through which states and MPOs will "transition to a performance-driven, outcome-based program that provides for a

greater level of transparency and accountability, improved project decision-making, and more efficient investment of federal transportation funds.”

The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) issued a set of rulemakings for the implementation of PBPP, sometimes also referred to as transportation performance management (TPM), with regard to the setting of targets and tracking of progress. Each rulemaking laid out the goals of performance for a particular area of transportation, established the measures for evaluating performance, specified the data to be used to calculate the measures, and established requirements for the setting of targets.

Under the PBPP process, state DOTs, MPOs, and providers of public transportation must link federal investment priorities to the achievement of performance targets in each of the performance areas. The Statewide and Metropolitan Planning Rule, published May 27, 2016, provides direction and guidance for the implementation of PBPP, including specified measures and data sources, forecasting performance, target-setting, documentation in the statewide and metropolitan long-range transportation plans and Transportation Improvement Programs (TIPs), and reporting requirements. The PBPP process requires coordination and written agreement on specific responsibilities for each applicable agency in accordance with the planning rule.

INTEGRATING PBPP INTO THE TRANSPORTATION PLANNING PROCESS

MAP-21, signed into law in 2012, placed increased emphasis on performance management within the federal-aid highway program, including development of national performance measures to be used by state DOTs and MPOs in setting targets. The law specifically called for the use of performance-based decision-making within metropolitan transportation planning processes. PBPP involves integrating performance management concepts into established federally required transportation planning and programming processes.

Each of the following sections of this report discusses the performance of an area of the PBPP performance measures. A brief description of the methodology for forecasting performance and setting targets is described, for both annual targets and the quadrennial targets recently established for the 2022-2025 performance period (in this update report). A review of actual performance vs. previous targets is also presented, though the coronavirus pandemic had an impact on both travel demand and transportation project implementation which is still being evaluated.

In general, the methodology for setting targets is to assess the trends in recent performance for each performance measure and then forecast performance based on the trend as well as the predicted impact of the projects in the long-range plan and TIP, using relevant indicators from the travel demand model. This reflects the anticipated effect of the projects toward achieving the TPB’s performance targets. Performance compared to targets informs the plans, projects, and policies of the TPB and member agencies, linking investment priorities to the performance targets.

PBPP AND VISUALIZE 2045 (2022)

This System Performance Report was originally prepared as an appendix of the Visualize 2045 LRTP scheduled for approval in June 2022. At the time of drafting the original report, the PBPP process was in an interval of transition. For the PBPP targets that were set for the initial quadrennial

performance period from 2018 through 2021, not all actual performance data through 2021 was yet available. This impacted some of the PBPP measures in the areas of Highway Assets and Highway System Performance. In addition, new four-year targets in these areas for the quadrennial performance period 2022 through 2025 had not yet been established in coordination with the state DOTs; these targets had to be set by October 1, 2022.

Accordingly, the original report only touched lightly on performance in the areas of Highway Asset and Highway System Performance. TPB staff subsequently worked to prepare this revised System Performance Report with respect to these PBPP performance areas near the end of calendar year 2022 to include newly available data on actual performance for the 2018-2021 period versus the targets for that period and to include information on the newly adopted targets for the 2022-2025 performance period as well as the recent annually adopted highway and transit safety targets.

OVERVIEW OF TPB ADOPTED PERFORMANCE TARGETS

The TPB adopts targets throughout the year as required: highway safety and transit safety targets are adopted annually; other targets are adopted every four years or as otherwise necessary. Table 1 below is a summary table of the most recent targets adopted by the TPB for the region for each of the five performance areas (for measures with multiple sub-targets, such as for transit asset classes, example targets are shown).

Table 1: Summary of TPB Adopted Performance Targets, as of December 21, 2022

Performance Area	Measure	Metric	Adopted Targets as of December 21, 2022
Highway Safety	Five-Year Rolling Average	# of Fatalities	253.0
	Five-Year Rolling Average	Rate of Fatalities	0.588
	Five-Year Rolling Average	# of Serious Injuries (SI)	1757.4
	Five-Year Rolling Average	Rate of Serious Injuries	3.733
	Five-Year Rolling Average	# of Non-Motorized Fatalities and SI	486.9
Highway Asset Condition	Percent Pavement Lane Miles Interstate / NHS (excl. Interstate)	In Good Condition	44.8% / 26.3%
	Percent Pavement Lane Miles Interstate / NHS (excl. Interstate)	In Poor Condition	1.6% / 7.3%
	Percent Bridge Deck Area	In Good Condition	25.7%
	Percent Bridge Deck Area	In Poor Condition	4.2%
Highway Reliability	Percent Person Miles Traveled Interstate / NHS (excl. Interstate)	Level of Travel Time Reliability	61.1% / 78.6%
Freight	Index	Truck Travel Time Reliability	2.56
Congestion	Annual Hours per Capita	Peak Hour Excessive Delay	22.7
	Percentage	Non-SOV Travel	37.7%
Vehicular Emissions	Total Emissions Reduction (kg/day)	VOCs / NOx	9.408 / 21.117
Transit Asset Management	Percentage	Revenue Vehicles exceeding Useful Life	6.9% (Bus)
	Percentage	Service Vehicles exceeding Useful Life	46.7% (Truck)
	Percentage	Track Segments with Performance Restrictions	3.5% (Heavy Rail)
	Percentage	Facilities rated Marginal or Poor	4.1% (Pass. Facilities)
Transit Safety	Number and Rate (per Revenue Vehicle Mile)	Fatalities by Mode (showing Urban Bus)	0 / 0
	Number and Rate (per Revenue Vehicle Mile)	Reportable Injuries by Mode (showing Urban Bus)	286 / 0.49
	Number and Rate (per Revenue Vehicle Mile)	Reportable Safety Events by Mode (showing Urban Bus)	404 / 0.74
	Mean Distance	Between Major Mechanical Failures by Mode (showing Urban Bus)	10918

RECENT INFORMATION ON PERFORMANCE VS. TARGETS

Similar to the preceding section, Table 2 is a summary of actual performance for which data are available compared to the relevant targets.

Performance data versus adopted targets is available for the areas of highway safety, bridge condition, highway reliability, and CMAQ Program emissions reduction. Further sections in this report will discuss performance vs. targets in more detail.

Table 2: Recent Performance vs Targets

	Performance Measure	Applicable Target Year / Period	Adopted Targets	Actual Performance	Met / Not Met
Highway Safety	# of Fatalities	2017-2021	253.0	319.4	Not Met
	Rate of Fatalities	2017-2021	0.588	0.750	Not Met
	# of Serious Injuries	2017-2021	2435.8	2,301.6	Met
	Rate of Serious Injuries	2017-2021	5.539	5.393	Met
	# of Non-Motorized Fatalities and Serious Injuries	2017-2021	508.6	545.1	Not Met
Highway Bridge Condition	NHS Bridges in Good Condition	2021	29.4%	39.4%	Met
	NHS Bridges in Poor Condition	2021	3.9%	1.7%	Met
Highway Reliability	Intestate Travel Time Reliability	2021	58.5%	71.7%	Met
	NHS (Non-Interstate) Travel Time Reliability	2021	72.7%	91.2%	Met
	Truck Travel Time Reliability	2021	2.12	2.30	Not Met
	Peak Hour Excessive Delay	2021	26.7	12.8	Met
Vehicular Emissions Reduction	Emissions Reduction VOCs	2018-2021	2.195	23.677	Met
	Emissions Reduction NOx	2018-2021	4.703	134.629	Met

HIGHWAY SAFETY PERFORMANCE

This chapter summarizes the federal requirements related to the establishment of regional highway safety performance targets and describes the methodology used to develop the National Capital Region's highway safety targets. The targets described in this report meet federal PBPP requirements and are consistent with the target setting approaches of Maryland, Virginia, and the District of Columbia.

The FHWA published the *National Performance Management Measures: Highway Safety Improvement Program; Final Rule* on March 15, 2016, with an effective date of April 24, 2016, followed by one year for implementation. Under the Highway Safety rule, State DOTs establish and report annual targets for five highway safety performance measures by August 31 of each year. MPOs then set targets specific to the metropolitan planning area within 180 days.

The goal of the implementation of the highway safety rule is to improve both the quantity and quality of safety data pertaining to serious injuries and fatalities. State DOTs and MPOs are expected to use the information generated by these regulations to make investment decisions that result in the greatest possible reductions in fatalities and serious injuries. Implementation of the rule is expected to promote greater transparency by disseminating the data publicly. In addition, aggregation of targets and progress at the national level will become possible through improved data consistency among the states and MPOs.

The TPB adopted the first set of highway safety targets for the National Capital Region in January of 2018. Since then, the TPB has devoted considerable effort to: 1) better understand the factors driving the unacceptably high numbers of fatal and serious injury crashes in the region, 2) identify countermeasures and strategies that are proven to be effective in reducing fatal and serious injury crashes, and 3) encourage TPB member jurisdictions and agencies to implement countermeasures and strategies to significantly reduce fatalities and serious injuries on the region's roadways.

Progress was made in each of these areas over the past five years. In the spring of 2020, the TPB reviewed the findings of a regional crash data analysis and considered the recommendations resulting from a consultant-led regional safety study that began in 2019. This work led to the adoption of a major safety resolution at the TPB's July 2020 meeting. A key element of this resolution was the establishment of the Regional Roadway Safety Program (RRSP) to assist member jurisdictions and the region to develop and/or implement projects, programs, or policies to equitably improve safety outcomes for all roadway users; three sets of RRSP projects have been approved since.

The TPB anticipates that the RRSP, combined with the continued safety improvement efforts of member agencies and jurisdictions, will result in improved performance that will be reflected in the federally required regional safety performance measures in future years.

HIGHWAY SAFETY PERFORMANCE MEASURES

Annual safety measures are defined as five-year rolling averages. The five required safety performance measures, along with the prescribed data sources, are outlined in Table 3 below.

Table 3: Summary of Highway Safety Measures

Performance Measure	Description	Data Source
Number of Fatalities <i>(5 year rolling average)</i>	Total number of fatalities during a calendar year	FARS¹
Rate of Fatalities per 100 million Vehicles Miles Traveled (VMT) <i>(5 year rolling average)</i>	Ratio of total fatalities to VMT	FARS and HPMS² (or MPO estimate)
Number of Serious Injuries <i>(5 year rolling average)</i>	Total number of serious injuries during a calendar year	State reported serious injury data
Rate of Serious Injuries per 100 million VMT <i>(5 year rolling average)</i>	Ratio of total serious injuries to VMT	State reported serious injury data and HPMS
Number of Non-Motorized Fatalities and Serious Injuries <i>(5 year rolling average)</i>	Total number of fatalities and serious injuries during a calendar year	FARS and State serious injury data

¹ FARS: Fatality Analysis Reporting System

² HPMS: Highway Performance Monitoring System

States and MPOs must fulfill the federal target setting requirements annually. State DOTs are required to set statewide targets for each of the five performance measures. Targets for the first three performance measures (number of fatalities, rate of fatalities, and number of serious injuries) must be identical to the targets set by the State Highway Safety Office (SHSO). Each target must also represent the anticipated performance outcome for all public roadways in the state, regardless of ownership. A breakdown of responsibilities for target setting are listed below.

State DOTs:

- Required to set statewide targets for each of the five performance measures:
 - Each of these targets must be identical to those set by the SHSO.
 - Each target shall represent anticipated performance outcome for all public roadways in the State, regardless of ownership.
 - Targets cannot be changed after they are reported.

MPOs:

- For each performance measure, the MPO will either:
 - Agree to plan and program projects so they contribute toward accomplishing the state DOT safety target for that performance measure, or
 - Commit to a quantifiable target for that performance measure for the MPO planning area:
 - Each target shall represent anticipated performance outcome for all public roadways in the MPO planning area, regardless of ownership.
 - MPOs shall coordinate with the state DOT(s) to ensure consistency.

MPO Coordination with State DOTs

MPOs are required to establish their performance targets in coordination with their state partners and these targets should be data-driven and realistic. The requirement for these safety targets to be evidence based and predictive of anticipated outcomes does not supersede or diminish any aspirational targets to which local, regional, or state jurisdictions are committed. Coordination is essential between these two entities in setting highway safety targets. Both should work together to share data, review strategies and understand outcomes.

TPB staff have developed the regional highway safety targets in close coordination with the Maryland Highway Safety Office of the Maryland Motor Vehicle Administration and the State Highway Administration's Innovative Performance Planning Division; the Transportation Operations Administration of the District of Columbia Department of Transportation (DDOT); and the Highway Safety Analysis Program at the Virginia Department of Transportation (VDOT). Each state's unique target setting approach was incorporated into the methodology used to develop the regional targets.

Target Reporting

State DOTs must report their targets to the FHWA within the state's HSIP (Highway Safety Improvement Program) annual report due each year on August 31.

MPOs do not report their targets to the FHWA, but rather to their respective state DOTs in a manner that is documented and mutually agreed upon. MPOs also report progress toward achieving their targets within the System Performance Report portion of their LRTP. In addition, MPO TIPs must include a discussion of how the implementation of the TIP will further the achievement of the targets.

FHWA Determination of Significant Progress

States do not have to meet each of their safety targets to avoid the consequences outlined in the rule but must either meet the target or make significant progress toward meeting the target for four of the five performance measures. The FHWA determines that the significant progress threshold is met if the performance measure outcome is better than the "baseline", defined as the five-year rolling average for that performance measure for the year prior to the establishment of the target. MPO progress is not evaluated by the FHWA.

Consequences for Failing to Meet Targets of Making Significant Progress

State DOTs that have not met or made significant progress toward meeting their safety performance targets lose some flexibility in how they spend their HSIP funds and are required to submit an annual implementation plan that describes actions the DOT will take to meet their targets.

There are no consequences outlined in the rule for MPOs not meeting their targets. However, the FHWA will review how MPOs are incorporating and discussing safety performance measures and targets in their long-range transportation plans and TIPs during MPO certification reviews.

RECENT TRENDS IN HIGHWAY SAFETY DATA

Recent trends in data are shown in Table 4 below. It should be noted that the final safety data for the year is published towards the end of the following year; targets for 2022 were developed during calendar year 2021 when actual performance data for 2020 was still being finalized.

Table 4: National Capital Region Highway Safety Trends

	2017	2018	2019	2020	2021	Change from 2020 to 2021
Number of Fatalities	313	303	300	321	360	↑ 12.1 %
Fatality Rate (per 100 million VMT)	0.695	0.673	0.659	0.876	0.886	↑ 1.1 %
Number of Serious Injuries	2,613	2,464	2,371	1,839	2,221	↑ 20.8 %
Serious Injury Rate (per 100 million VMT)	5.755	5.473	5.211	5.026	5.277	↑ 5.0 %
Number of Nonmotorist Fatalities & Serious Injuries	586	552	595	440	518	↑ 17.8 %

Between 2020 and 2021, both fatalities and serious injuries from roadway crashes increased, including those of nonmotorists. Notably, the rise in the number of serious injuries and in the serious injury rate counters a general downward trend that has been occurring since at least 2006, the earliest year for which the TPB has serious injury data. In addition, while the rise in the number of roadway fatalities in 2021 continues an upward trend for the region, the fatality increase translates into a relatively small change in the fatality rate (a 1.1 percent increase since 2020) due to an 11 percent increase in regional VMT in 2021.

As a result of the region’s roadway safety performance between 2017 and 2021, the region met two out of its five highway safety targets (see, Table 5). Note that performance is reported as five-year averages, and although the region experienced an increase in the number of serious injuries and in the serious injury rate in 2021, the increases were not significant enough to offset progress made between 2017 and 2020 in these categories.

PROGRESS TOWARDS THE 2017-2021 HIGHWAY SAFETY TARGETS

Table 5 (next page) shows the region’s performance on the five safety performance measures with respect to the 2017-2021 targets adopted in January 2022.

Table 5: Highway Safety 2017-2021 Actuals vs. Targets

Performance Measure (5-year rolling average)	2017-2021 Target	2017-2021 Actual	Status
# of Fatalities	253.0	319.4 ¹	Not met
Fatality Rate (per 100 MVMT)	0.588	0.750 ¹	Not met
# of Serious Injuries	2,435.8	2,301.6	Met
Serious Injury Rate (per 100 MVMT)	5.539	5.393	Met
# Nonmotorist Fatalities & Serious Injuries	508.6	545.1	Not met

¹ Reflects fatality data from State DOTs and FARS.

As shown above, the region met the 2017-2021 targets for the number of serious injuries and the serious injury rate performance measures. However, the region did not meet the targets set for the number of fatalities, the number of nonmotorist fatalities and serious injuries, and the fatality rate.

REGIONAL HIGHWAY SAFETY TARGET SETTING APPROACH

To account for and incorporate the different target setting approaches used by Maryland, Virginia, and the District of Columbia into targets for the entire National Capital Region (NCR), staff has applied the following target setting methodology to develop the TPB approved targets:

- identify a “sub-target” for the Maryland portion of the NCR by applying MDOT’s target setting approach to the NCR safety data;
- identify a “sub-target” for the Virginia portion of the NCR by applying a variation of VDOT’s target setting approach to the NCR safety data;
- identify a “sub-target” for the District of Columbia portion of the NCR by directly incorporating DDOT’s targets;
- combine the three sub-targets mathematically into a set of initial regional targets.
- compare each performance measure’s initial regional target with the corresponding target adopted last year; and
- select the lower (more aggressive) of the two targets as the current year’s target.

Overview of Member States’ Target Setting Methodologies

Maryland: In previous years Maryland set quantifiable and data driven highway safety targets that supported their Toward Zero Deaths (TZD) approach by developing interim targets to reduce overall fatalities and serious injuries by at least 50 percent by 2030.

In 2021 Maryland adopted a new methodology to set highway safety targets. Unlike the TZD approach, annual targets this year were set using a two-pronged approach. Targets that are experiencing a decreasing trend over time are set using five-year rolling averages and an exponential

trend line without a fixed endpoint to calculate future targets. For those targets experiencing increasing trends, however, projections are based on a two percent decrease from the 2016-2020 five-year average, continuing with a two percent decrease for each successive five-year average.

Maryland officials provided TPB staff with trend lines and interim targets for each of the five performance measures based on the safety data for the Suburban Maryland portion of the NCR.

Virginia: The method used by Virginia to set annual targets is based on a model that forecasts future fatalities and serious injuries based on a broad range of factors. VDOT then estimated the collective impact of their planned and programmed countermeasures and reduced the model forecast by the projected impacts of their engineering and behavioral efforts. This process is only viable at a statewide level and cannot be used effectively to determine targets for smaller regions within the state. To assist their MPOs, VDOT advised MPOs to apply linear regression techniques to make projections for each of the numeric performance measures¹ to calculate the 2019-2023 regional targets.

District of Columbia: The District of Columbia analyzed their safety data using a combination of annual and five-year average data and polynomial trend lines to determine their targets. TPB staff directly incorporated the District of Columbia targets, as published in their HSIP Annual Report, into the NCR target setting methodology.

CALCULATION OF THE NATIONAL CAPITAL REGION HIGHWAY SAFETY TARGETS

Numerical Targets

The NCR targets for the number of fatalities, number of serious injuries, and number of nonmotorist fatalities and serious injuries were calculated by summing the sub-targets for the Suburban Maryland, Northern Virginia, and District of Columbia portions of the region. This is straightforward mathematical addition.

As a final step, the calculated numerical targets were compared to the corresponding targets adopted by the TPB last year and the lower (more aggressive) target for each performance measure was selected.

Rate Targets

Determination of rate targets (fatality rate and serious injury rate) are somewhat more complicated and involve mathematically combining the effects of the Suburban Maryland, Northern Virginia and District of Columbia targets according to their respective proportions of total regional VMT. The following steps illustrate the process for the fatality rate (a similar process was used for the serious injury rate):

¹ Number of fatalities, number of serious injuries, and number of nonmotorist fatalities plus serious injuries

- 1) Determine the percent fatality rate reduction represented by each sub target.

Fatalities per 100 MVMT	2017-2021 Average	2019-2023 Average (sub target)	Percent change
Suburban MD	0.931	0.775	-16.78%
NOVA	0.508	0.460	-9.51%
DC	0.932	0.720	-22.75%

- 2) Determine the proportion of total regional VMT attributable to Suburban Maryland, Northern Virginia, and DC.

Sub region	100 MVMT (2021)	Proportion
Suburban MD	204.59	50.33%
NOVA	169.41	41.68%
DC	32.48	7.99%
Sum	406.47	100.00%

- 3) Determine the percent change for the regional rate by multiplying the percent change (from step 1) by the VMT proportion (from step 2).

Sub region	A: Percent change in fatality rate (from step 1)	B: Proportion (from step 2)	A x B
Suburban MD	-16.78%	50.33%	-8.446%
NOVA	-9.51%	41.68%	-3.962%
DC	-22.75%	7.99%	-1.818%
Sum			-14.226%

- 4) Apply the percent change for the regional rate calculate in step 3 (-4.569%) to the 2012-2016 average fatality rate. This is the regional fatality rate target for 2014-2018.

Fatalities per 100 MVMT	2017-2021 Average	Regional percent change (from step 3)	2019-2023 Average (regional target)
NCR	0.750	-14.226%	0.643

As a final step, the calculated rate targets were compared to the corresponding targets adopted by the TPB last year and the lower (more aggressive) target for each performance measure was selected. Since the fatality rate target of 0.588 set last year is lower than the 0.643 figure calculated by mathematically combining the three sub-regional targets, the staff-recommended target is 0.588 (and not 0.643).

REGIONAL HIGHWAY SAFETY TARGETS

Table 6 displays the 2019 - 2023 National Capital Region Highway Safety targets, adopted by the TPB on December 21, 2022, as well as the previous two sets of targets. As per federal regulations, the National Capital Region highway safety targets are updated on an annual basis by no later than February 28 of each calendar year.

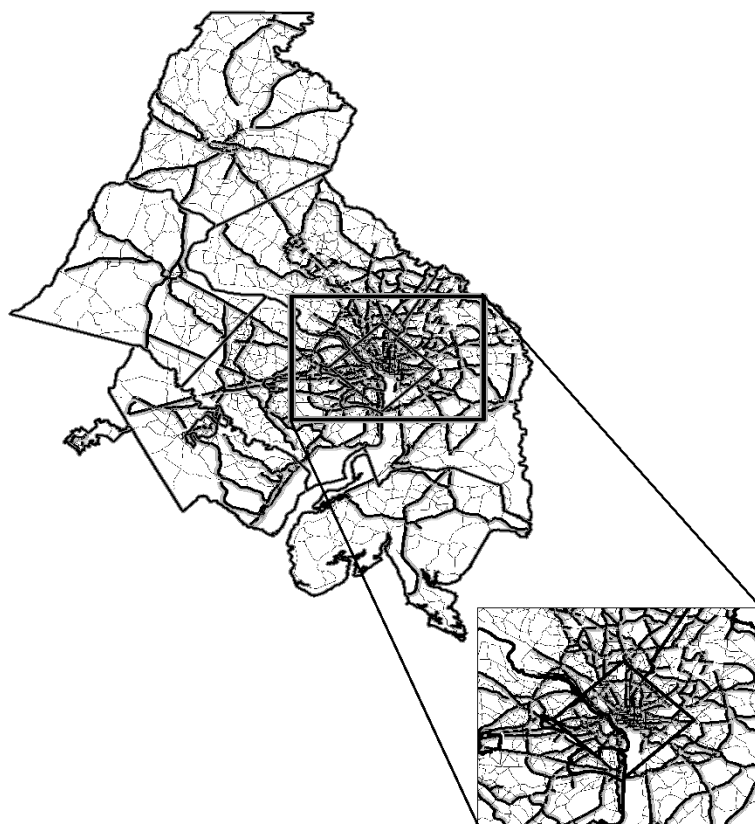
Table 6: Summary of Regional Highway Safety Performance Measure Targets

Performance Measure (5-year rolling average)	2017- 2021 Target	2018- 2022 Target	2019- 2023 Target	Difference (2019-2023 vs. 2018-2022)	Percent Difference
# of Fatalities	253.0	253.0	253.0	0.0	0.0%
Fatality Rate (per 100 MVMT)	0.588	0.588	0.588	0.0	0.0%
# of Serious Injuries	2,435.8	1,889.7	1,757.4	-132.3	-7.0%
Serious Injury Rate (per 100 MVMT)	5.539	3.867	3.733	-0.134	-3.5%
# Nonmotorist Fatalities & Serious Injuries	508.6	492.4	486.9	-5.5	-1.1%

PAVEMENT AND BRIDGE CONDITION PERFORMANCE

This report provides an overview of the performance measures concerning the condition of bridges and pavements within the TPB’s metropolitan planning area. The *National Performance Management Measures; Assessing Pavement Condition for the National Highway Performance Program and Bridge Condition for the National Highway Performance Program* final rule addresses requirements established by MAP-21 and the FAST Act. The rule became effective on May 20, 2017, with one year for implementation. Targets for the first quadrennial performance period 2018 through 2021 were adopted by the TPB on July 18, 2018 in Resolution R2-2019. Targets for the second performance period 2022 through 2025 were adopted by the TPB on October 19, 2022 in Resolution R3-2023.

NATIONAL HIGHWAY SYSTEM



Several of the MAP-21 performance measures directly involved the NHS. The 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 United States Department of Transportation (DOT) in cooperation with the states, local officials, and MPOs. With the adoption of MAP-21 on October 1, 2012, the NHS became the “enhanced-NHS” by adding roads that were previously classified as principal arterials but not yet part of the system. These Interstate and Non-Interstate roadways on the NHS are the primary roadways for the assessment of the PBPP measures, shown in Figure 1. When performance measures are referring to the Interstate or Non-Interstate roadways on the NHS, it is the MAP-21 “enhanced-NHS.”

Figure 1: National Highway System Network in TPB Planning Region

State DOTs have the ability to make modifications to the NHS by either removing or adding additional roadways. This can be done in writing to the FHWA Division Office. Supporting documents must be included such as maps and documentation of the coordination with the effected jurisdictions. The FHWA Division Office will review, summarize, and move changes for recommendation to FHWA Headquarters. FHWA Headquarters will approve any modifications to the NHS.

PAVEMENT AND BRIDGE CONDITION PERFORMANCE MEASURES

The Pavement and Bridge Condition Performance Measures final rule, published in the Federal Register on January 18, 2017, established measures for state DOTs to assess the condition of pavements on the non-Interstate NHS; pavements on the Interstate System; and bridges carrying the NHS, including on- and off-ramps connected to the NHS. Targets must be set for six particular areas; 1) Percent of pavements on the Interstate System in good condition, 2) Percent of pavements on the Interstate in poor condition, 3) Percent of pavements on the NHS (excluding Interstate) in good condition, 4) Percent of pavements on the NHS (excluding Interstate) in poor condition, 5) Percentage of NHS bridge deck classified in good condition, 6) Percentage of NHS bridge deck classified in poor condition. Table 7 provides a summary of the measures as well as the 2018-2021 and 2022-2025 quadrennial performance period adopted targets.

Data for these performance measures are available through databases overseen by the FHWA: the Highway Performance Monitoring System (HPMS) and the National Bridge Inventory (NBI). State DOTs have the responsibility to report data to the HPMS and the NBI annually.

Table 7: Summary of Regional Pavement and Bridge Performance Measures and 2018-2021 and 2022-2025 Targets

Interstate Pavement	CY 2018 – 2021 Four Year Target	CY 2022 – 2025 Four Year Target
(1) Percentage of pavements on the Interstate System in Good condition	52.7%	44.8%
(2) Percentage of pavements on the Interstate System in Poor condition	1.7%	1.6%
NHS (Non-Interstate) Pavement	CY 2018 – 2021 Four Year Target	CY 2022 – 2025 Four Year Target
(3) Percentage of pavements on the NHS (excl. Interstate) in Good condition	31.1%	26.3%
(4) Percentage of pavements on the NHS (excl. Interstate) in Poor condition	7.0%	7.3%
Bridges	CY 2018 – 2021 Four Year Target	CY 2022 – 2025 Four Year Target
(5) Percentage of NHS Bridges Classified as in Good Condition	29.4%	25.7%
(6) Percentage of NHS Bridges Classified as in Poor Condition	3.9%	4.2%

Pavement Condition

The HPMS database includes the data needed for calculating the good and poor metrics. Data include roughness, cracking, rutting for asphalt pavement, and faulting for concrete pavement. The measures are aggregated by lane miles.

State DOTs must establish targets, regardless of ownership, for the full extent of the Interstate and non-Interstate NHS. MPOs can either support the relevant state DOTs four-year target or establish their own within 180 days after the state DOT's target are established.

The initial statewide two and four-year targets for the non-Interstate NHS and four-year targets for the Interstate were adopted in May 2018, with subsequent reporting to FHWA by October 1, 2018, for the baseline quadrennial performance period of 2018 through 2021. The second round of target setting for this PBPP area covers the quadrennial calendar year period 2022 through 2025, with targets required to be set and reported by October 1, 2022.

Bridge Condition

For the bridge condition performance measures, the measures are calculated based on deck area and a classification of the bridge structure condition. The classification is based on NBI condition ratings for the Deck, Superstructure, Substructure, and Culvert. Condition is determined by the lowest rating of deck, superstructure, substructure, or culvert. If the lowest rating is greater than or equal to 7, the bridge is classified as good; if is less than or equal to 4, the classification is poor. (Bridges rated below 7 but above 4 are classified as fair; there is no related performance measure.) Deck area is computed using NBI criteria of Structure Length, Deck Width or Approach Roadway Width (for some culverts).

State DOTs must establish targets for all bridges carrying the NHS, which includes on- and off-ramps connected to the NHS within a state, and bridges carrying the NHS that cross a State border, regardless of ownership. As with the pavement performance measures, MPOs can either support the relevant state DOT(s) four-year target or establish their own within 180 days after the state DOT's targets are established.

Pavement and Bridge Penalties

If FHWA determines that a state DOT's Interstate pavement condition falls below the minimum level for the most recent year, the state DOT must obligate a portion of National Highway Performance Program (NHPP) and transfer a portion of Surface Transportation Program (STP) funds to address Interstate pavement condition. If for three consecutive years more than 10.0 percent of a state DOT's NHS bridges' total deck area is classified as Structurally Deficient, the state DOT must obligate and set aside National Highway Performance Program (NHPP) funds for eligible projects on bridges on the NHS.

Data Visualization: Pavement and Bridge Condition

In support of the 2022 target-setting, a data visualization of pavement (2020) and bridge (2021) condition in the National Capital Region was prepared. This data can be seen at:

https://gis.mwcog.org/webmaps/tpb/pbpp/highway_assets/

PAVEMENT AND BRIDGE CONDITION TARGET SETTING APPROACH

This section describes the TPB’s methodology for determining the initial performance targets and coordination with the departments of transportation of the District of Columbia, Maryland, and Virginia. The following approaches were used by the region’s state DOTs in developing pavement and bridge condition targets.

District of Columbia

Tables 8 and 9 below are the established performance measures for both pavement and bridge conditions in the District of Columbia. Targets were established by use of historical data, future programmed projects, and future budgets appropriated to maintain pavement in a state of good repair. It should be noted that the District of Columbia has a number of bridges and roadways that are not maintained by DDOT but rather by other agencies including the National Park Service (NPS) and the Architect of the Capitol. Though DDOT has no ability to impact the condition of bridges owned by other entities, bridges such as the NPS-owned Arlington Memorial Bridge, are factored into the overall bridge condition in the District Columbia.

Table 8: Summary of the DC 2022-2025 Targets for Pavement Condition

Interstate Pavement	CY 2022 – 2023 Two Year Target	CY 2022 – 2025 Four Year Target
(1) Percentage Good	10%	5%
(2) Percentage Poor	5%	5%
NHS (Non-Interstate) Pavement	CY 2022 – 2023 Two Year Target	CY 2022 – 2025 Four Year Target
(3) Percentage Good	67%	54%
(4) Percentage Poor	7.1%	14.1%

Table 9: Summary of the DC 2022-2025 Targets for Bridge Condition

Bridges	CY 2022 – 2023 Two Year Target	CY 2022 – 2025 Four Year Target
(5) Deck Area Good	15.8%	24.9%
(6) Deck Area Poor	8.6%	4.1%

Maryland

Tables 10 and 11 below are the established 2022-2025 forecast performance for both pavement and bridge conditions in the portion of Interstate and NHS (non-Interstate) roadways within the TPB planning area for the state of Maryland (i.e., Suburban Maryland); These are based on the Maryland statewide targets but took into account the condition of roadways in the TPB planning area; in other

words, sub-regional targets. These forecasts were established by use of historical data, future programmed projects, and future budgets appropriated to maintain pavement in a state of good repair.

Table 10: Summary of Suburban Maryland 2022-2025 Forecasts for Pavement Condition

Interstate Pavement	CY 2022 – 2023 Two Year Forecast	CY 2022 – 2025 Four Year Forecast
(1) Percentage Good	Not Required	62.8%
(2) Percentage Poor	Not Required	0.3%
NHS (Non-Interstate) Pavement	CY 2022 – 2023 Two Year Forecast	CY 2022 – 2025 Four Year Forecast
(3) Percentage Good	32.4%	31.6%
(4) Percentage Poor	6.5%	7.2%

Table 11: Summary of Suburban Maryland 2022-2025 Forecasts for Bridge Condition

Bridges	CY 2022 – 2023 Two Year Forecast	CY 2022 – 2025 Four Year Forecast
(5) Deck Area Good	29.5%	27%
(6) Deck Area Poor	2%	5%

Virginia

Tables 12 and 13 below are the established 2022-2025 performance targets for both pavement and bridge conditions for Virginia. Through coordination between TPB staff and VDOT staff it was determined that, contrary to the case in Maryland, a forecast for Northern Virginia alone was not feasible. Statewide targets were established by use of historical data, future programmed projects, and future budgets appropriated to maintain pavement in a state of good repair.

Table 12: Summary of VA 2022-2025 Targets for Pavement Condition

Interstate Pavement	CY 2022 – 2023 Two Year Target	CY 2022 – 2025 Four Year Target
(1) Percentage Good	45%	45%
(2) Percentage Poor	<3%	<3%
NHS (Non-Interstate) Pavement	CY 2022 – 2023 Two Year Target	CY 2022 – 2025 Four Year Target
(3) Percentage Good	25%	25%
(4) Percentage Poor	<5%	<5%

Table 13: Summary of VA 2022-2025 Targets for Bridge Condition

Bridges	CY 2022 – 2023 Two Year Target	CY 2022 – 2025 Four Year Target
(5) Deck Area Good	33.5%	33%
(6) Deck Area Poor	3.5%	3%

REGIONAL PAVEMENT AND BRIDGE TARGETS

MPOs have two options for setting targets for the pavement and bridge performance measures. The first option is to support the statewide targets established by the state DOTs. The second option is for the MPO to establish their own quantifiable four-year targets for these measures. The TPB has chosen the latter option, setting its own targets for these performance measures for the metropolitan planning area. The coordination for the establishment of these targets was closely linked to the information provided by the state DOTs as well as information obtained from the HPMS and the NBI.

Pavement

As a first step in forecasting performance in for the quadrennial performance period for pavement conditions for the TPB planning area, data was obtained and analyzed for the HPMS database using the field manual inventory, which contains metrics for rutting, faulting, cracking, and international roughness index (IRI). Next, TPB staff were able to calculate the number of lane miles within the planning area for the District of Columbia, Maryland, and Virginia. Table 14 gives the lane mileage for each state or part of the state, as well as the regional total number of lane miles in the TPB region. Finally, the statewide targets for the District of Columbia and Virginia were applied to their respective lane miles within the TPB region. For the state of Maryland, forecasted targets for the portion of the state in the TPB planning area were provided and applied to the lane miles.

Table 14: Summary of the 2021 Lane Miles for Interstate and Non-Interstate Roadways in the TPB Region

Sub-Region	Interstate Lane Miles	Non-Interstate Lane Miles
DC	53.5	472.5
MD*	863.8	2259.0
VA*	756.0	1917.8
National Capital Region	1673.3	4649.3

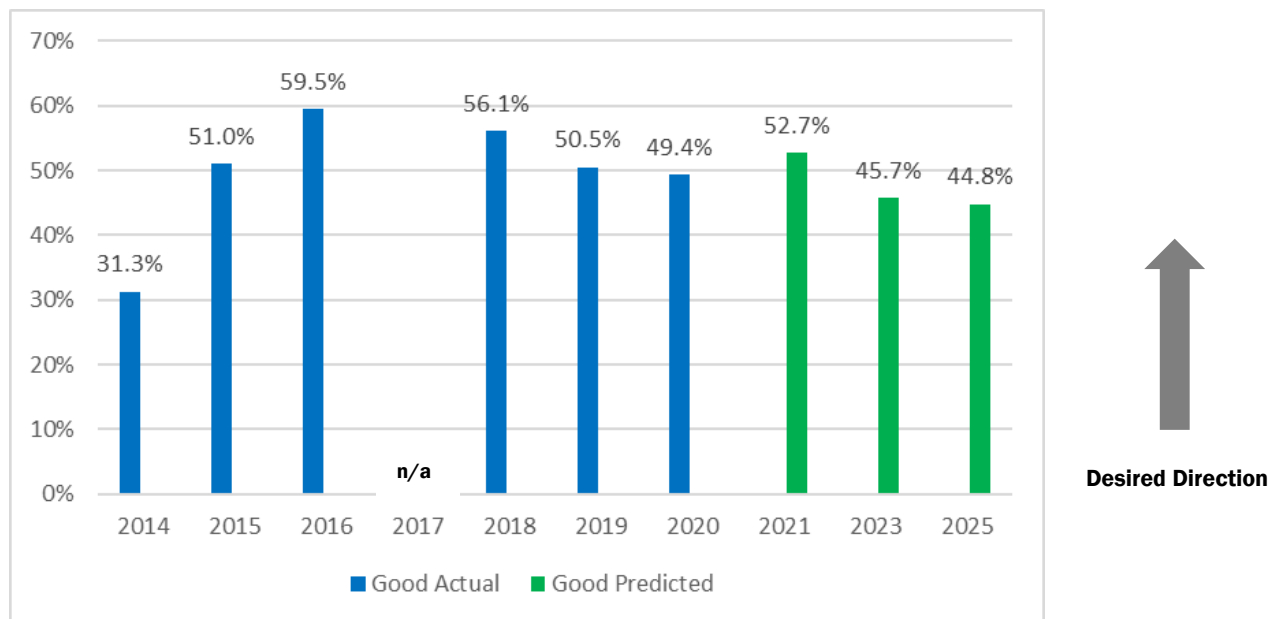
* Lane miles within the TPB's metropolitan planning area

RECENT PERFORMANCE

At the time of this report, pavement condition data is available through 2020. Figures 2 through 5 below display actual performance data annually through 2020 (except for 2017 data, which was not available) followed by biennial forecasts through 2025.

Observing trends through 2020, it appears that the four-year targets (by 2021) for Good condition pavement will not be met, narrowly in the case of the Interstate and considerably for the NHS (Non-Interstate). However, the reverse is apparent for the measure of the percentage of pavement in Poor condition; the four-year targets for the Interstate and NHS (non-Interstate) should be met easily. One explanation is that the State DOTs have prioritized their pavement improvement projects for fixing the poorest sections of pavement rather than keeping good pavement in that condition. Another, or concurrent, explanation for the differences observed in actual performance versus the targets is that methodological assumptions and forecasting techniques were not well developed in 2018. Finally, the coronavirus pandemic has affected project completion in 2020, which led to some planned projects and pavement maintenance not completed.

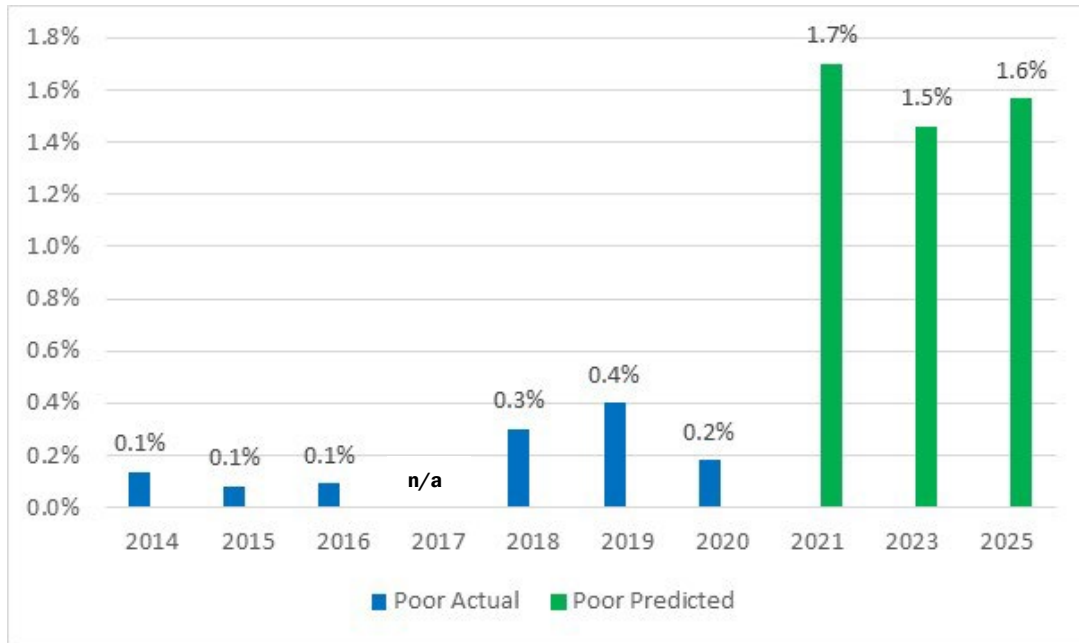
Figure 2: Interstate Pavement: Performance vs. Targets (Good Condition)



n/a - 2017 data not available.

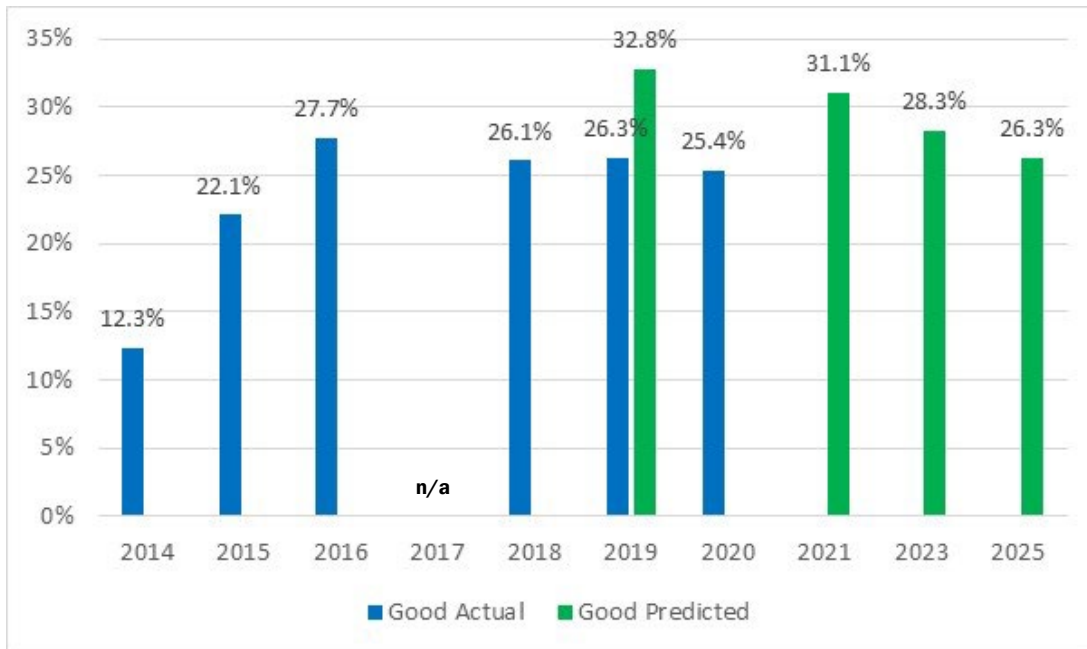
Blue bar graphs are actual data; green bars are the forecasts developed for 2021 through 2025, which were then adopted as targets. Performance against the 2-year targets from the first performance period established for 2019 for the NHS (Non-Interstate) measures is also shown. As noted above, the 2-year (2019) target for NHS (Non-Interstate) in Good condition was not met. The future targets, for 2021 and for the second performance period, are more conservative.

Figure 3: Interstate Pavement: Performance vs. Targets (Poor Condition)



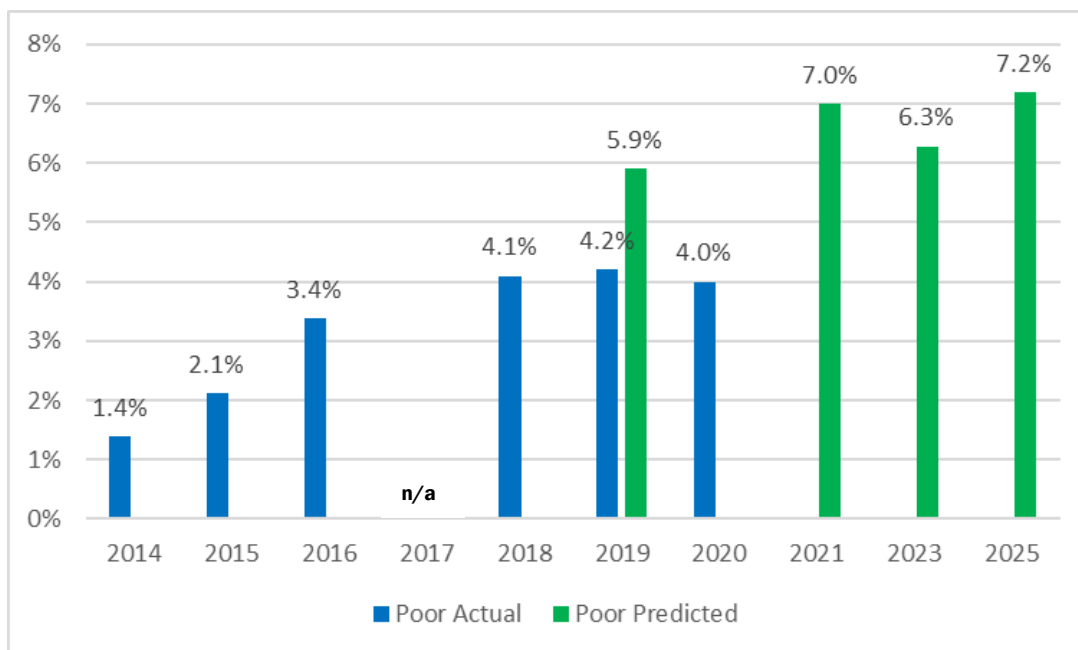
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Desired Direction

Figure 4: NHS (Non-Interstate) Pavement: Performance vs. Targets (Good)



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Desired Direction

Figure 5: NHS (Non-Interstate) Pavement: Performance vs. Targets (Poor)



Bridges

In terms of forecasting the four-year performance for bridge condition within the TPB region, a similar methodology to that of pavement was used. TPB staff collected data from the NBI, analyzing the condition of the surface area as the applicable metric. Next, the deck areas of bridges within the District of Columbia and the portions of Maryland and Virginia that are within the TPB planning area was calculated. Table 15 provides a breakdown of the surface area of bridges within the TPB planning area in 2021. Finally, the statewide targets were applied to the respective deck areas for each state in the planning area and four-year targets for the region was calculated.

Table 15: Summary of the 2021 Total Deck Area of Bridges in the TPB Region

Deck Areas (square meters)	
DC	455,725
MD*	936,967
VA*	1,310,605
National Capital Region	2,703,297

* Deck area in the sub-region of the state within TPB region.

PERFORMANCE VS. TARGETS**

At the time of this report, bridge condition data is available through 2021, the four-year target year of the first performance period. Figures 6 and 7 below display actual performance data in comparison to the 2019 and 2021 targets (two-year and four-year for the 2018-2021 quadrennial performance period). The four-year target for 2021 for Good bridge performance of 29.4 percent was easily met with actual performance measured at 39.4 percent. Though the trend line has been downwards, regionally several significant bridge projects have been completed, especially the rehabilitation of the Arlington Memorial Bridge in the District as well as multiple projects on the Capital Beltway, which has kept overall bridge condition in good shape.

The four-year 2021 target for Poor bridge performance of no more than 3.9 percent was also met, with actual performance of 1.7 percent, as shown in Figure 7. It is noteworthy that this percentage decreased after higher actual performance in 2019 and 2020, presumably a result of the aforementioned bridge projects completed in the region.

As for the pavement data, blue bar graphs are actual data; green bars are the forecasts developed for the first and second performance period, which were then adopted as targets. Targets developed and adopted for 2023 and 2025 are similar to those for 2019 and 2021 but are more conservative than past performance.

Figure 6: Bridges: Performance vs. Target (Good)

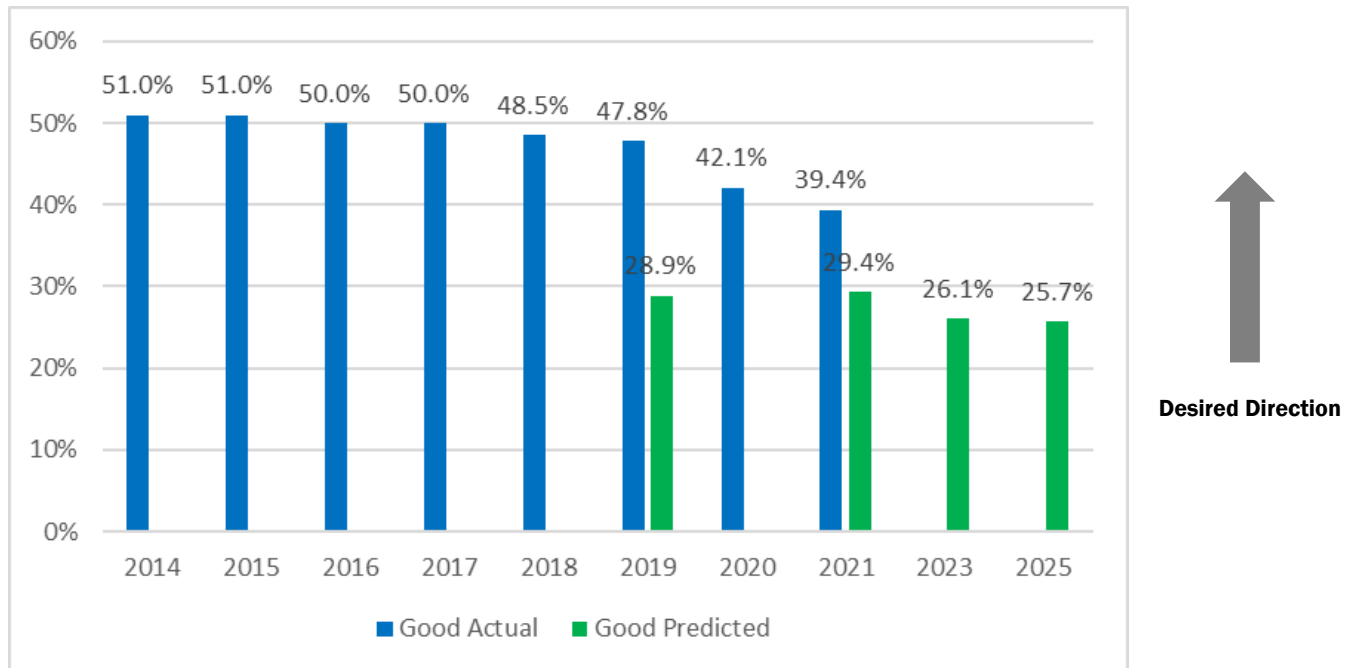
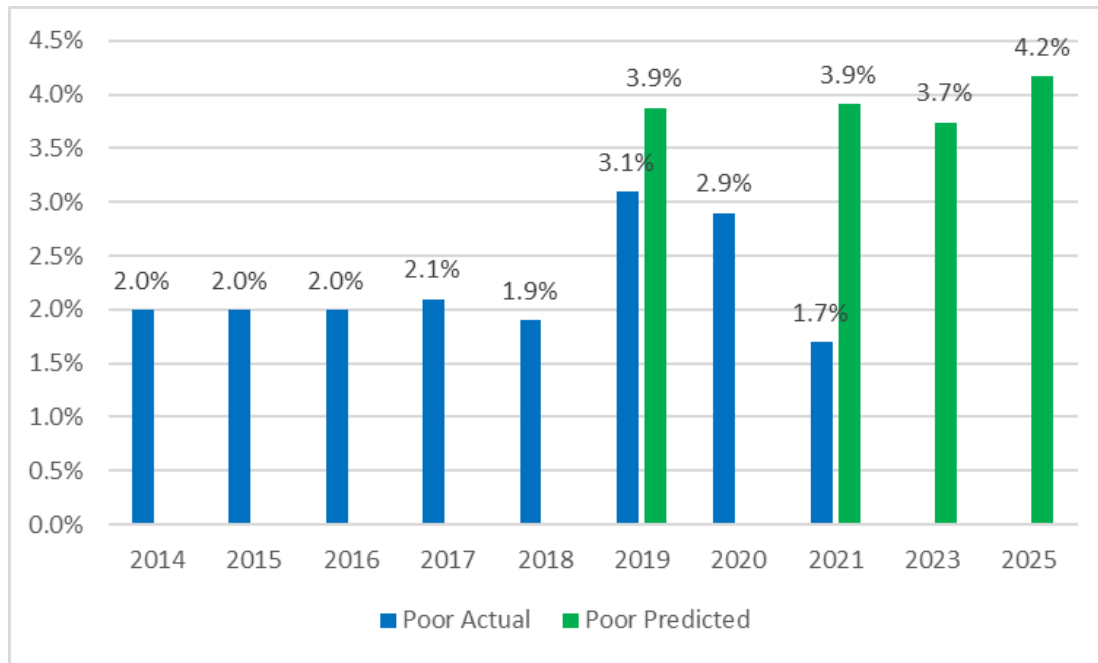


Figure 7: Bridges: Performance vs. Target (Poor)



Desired Direction

HIGHWAY SYSTEM PERFORMANCE

This section summarizes the performance for the targets associated with the Highway System Performance area. This includes performance concerning Travel Time Reliability (TTR) on both the Interstate and Non-Interstate NHS roadways as well as the Truck Travel Time Reliability (TTTR) Index on Interstate roadways. The targets described in this report meet the federal requirements and are consistent with the target setting approaches of Maryland, Virginia, and the District of Columbia. The four-year targets for the period 2018 through 2021 were approved by the TPB on July 18, 2018 in Resolution R1-2019. Targets for the first quadrennial performance period 2018 through 2021 were adopted by the TPB on July 18, 2018 in Resolution R1-2019. Targets for the second performance period 2022 through 2025 were adopted by the TPB on October 19, 2022 in Resolution R3-2023.

HIGHWAY SYSTEM PERFORMANCE MEASURES

The FHWA published the *System Performance: Highway and Freight, Congestion Mitigation and Air Quality (CMAQ)* final rule on January 18, 2017, with an effective date of May 20, 2017, followed by one year for implementation. Accordingly, state DOTs had until May 20, 2018 to initially set targets. The rule requires state DOTs to set targets for four performance measures concerning Highway and Freight: 1) Interstate Travel Time Reliability (TTR), 2) National Highway System (NHS) TTR, and 3) Freight Reliability (Truck Travel Time Reliability (TTTR))², shown in Table 16. In addition, the FHWA requires state DOTs to set three performance measures under the CMAQ Program: 1) Peak Hour Excessive Delay (PHED), 2) Mode Share (Non-SOV), and 3) Emission Reductions, which are covered in the next chapter.

This section of the report provides an overview of the measures, data collection, and the methodology and forecasting methods used for target setting by the TPB.

Table 16: Summary of Highway System Performance Measures

Performance Measures	
National Highway System	(1) Interstate Travel Time Reliability (TTR) - Percent of person-miles traveled on the Interstate System that are reliable
	(2) NHS (Non-Interstate) Travel Time Reliability (TTR) - Percent of person-miles traveled on the non-Interstate National Highway System (NHS) that are reliable
Freight Movement	(3) Freight Reliability (TTTR) - Measurement of travel time reliability on the Interstate System using a Truck Travel Time Reliability (TTTR) Index.

² An additional performance measure for Greenhouse Gas Emissions was repealed on May 31, 2018.

Travel Time Reliability and Truck Travel Time Reliability

The TTR measure assesses the reliability of roadways on the Interstate and Non-Interstate (NHS) systems. TTR is defined by the FHWA as the percent of person-miles on the Interstate/NHS that are reliable. Concerning freight, reliability is the ratio of the Interstate System Mileage providing for reliable TTTR. Data are derived from the travel time data set found in the National Performance Management Research Data Set (NPMRDS). Performance data for the measures for the region was obtained from NPMRDS. This data was collected by INRIX using a widget created for the Regional Integrated Transportation Information System (RITIS). RITIS is an automated data sharing, dissemination, and archiving system that includes many performance measure, dashboard, and visual analytics tools that help agencies gain situational awareness, measure performance, and communicate. To create a measure, the data from this is calculated by the University of Maryland Center for Advanced Transportation Technology Laboratory (CATT Lab). The RITIS widget is designed to provide historical data and baseline metrics. The metrics used are Level of Travel Time Reliability (LOTTR) and the TTTR Index.

For the first quadrennial performance period of 2018-2021 state DOTs were required to establish two and four-year targets for the Interstate TTR and for the TTTR Index, but initially only a four-year target for TTR of the NHS. The statewide targets were included in the state DOTs' baseline performance period reports submitted to the FHWA by October 1, 2018. As with other performance measures, MPOs then had 180 days following to establish their own targets or endorse the statewide targets.

With the second quadrennial performance period of 2022-2025, two-year and four-year targets were established for both TTR and the TTTR Index measures. As with the highway asset measures, performance is evaluated against the targets for the most recent data available, e.g., ideally 2023 for two-year targets and 2025 for four-year targets.

REGIONAL HIGHWAY SYSTEM PERFORMANCE TARGET SETTING APPROACH

As all state DOTs and MPOs are required to do for this group of performance measures, TPB staff obtained data from the NPMRDS and utilized RITIS with the MAP-21 widget to collect actual performance data.

For forecasting highway system performance and determining targets for both the 2017-2021 and the 2022-2025 quadrennial performance periods, staff selected a methodology that averaged two techniques: the extrapolation of measured performance and the use of the TPB's travel demand model data.

- Extrapolation of Measured Performance
 - For this technique, measured data for the previous years was selected and extrapolated, via polynomial regression, through the four-year period.
- Travel Demand Model
 - In support of the long-range metropolitan transportation plan, the TPB uses a travel demand model which produced congestion/related outputs for specific modelled years: 2016, 2020, 2025, etc. For this technique an output indicator for the Percentage of Congested AM Peak Hour VMT was applied to forecast the percentage changes to the performance measure.

REGIONAL HIGHWAY SYSTEM PERFORMANCE TARGETS

Based on the performance data and forecasting methodology used, Table 17 shows the adopted regional four-year targets for the two quadrennial performance periods to date, for the TPB planning area for the three highway system performance measures.

Table 17: Summary of Regional 2018-2021 and 2022-2025 Targets for TTR and TTTR Index

	CY 2018 - 2021 Four Year Target	CY 2022 - 2025 Four Year Target
TTR - Interstate		
Percent of person-miles traveled on the Interstate System that are reliable	58.5%	61.1%
TTR - NHS (Non-Interstate)		
Percent of person-miles traveled on the non-Interstate NHS that are reliable	72.7%	78.6%
TTTR Index		
Measurement of the Interstate System Mileage providing for Reliable Truck Travel Times	2.12	2.56

PERFORMANCE VS. TARGETS

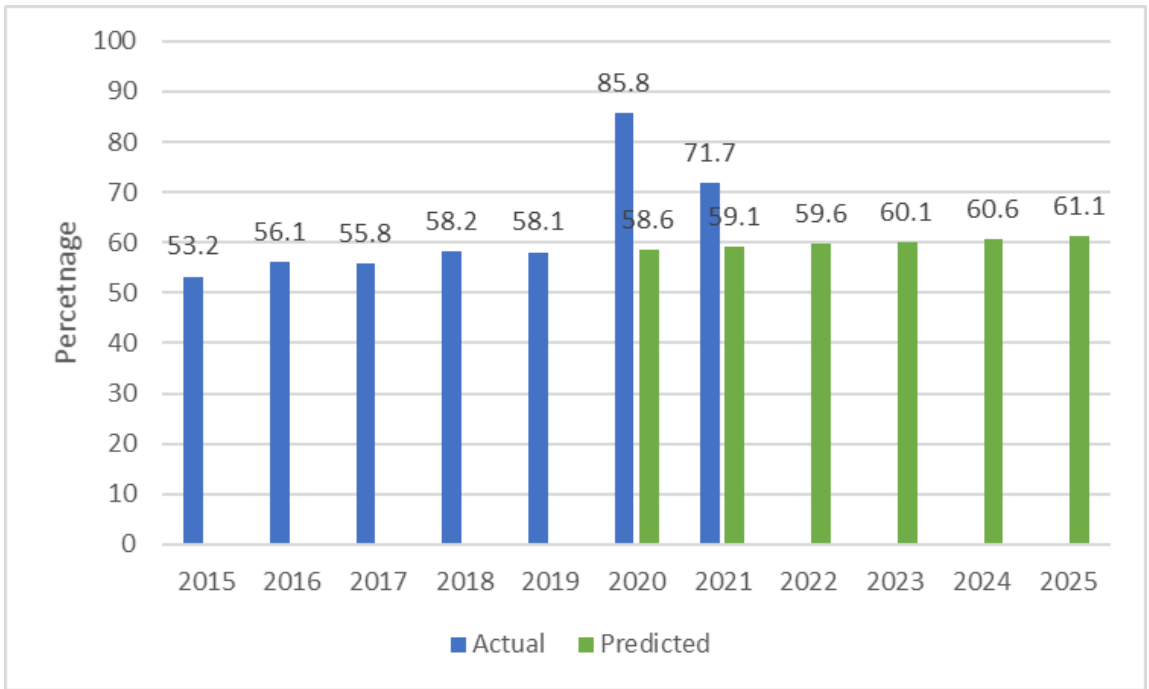
Performance data for the three targets above was obtained from the NPMRDS by TPB staff on an annual basis. The data for 2021 became available early in 2022, so actual performance for the first quadrennial performance period can be compared to the targets established in 2018. It should be noted that the four-year performance measure targets are set for conditions at the end of the performance period, i.e., the 2021 performance; they are not based on averages throughout the period.

The impacts of the coronavirus pandemic that began in March 2020 on the highway travel performance measures are evident in Figures 8 and 9. For 2020 and 2021 the performance for TTR (Interstate) and TTR (NHS Non-Interstate) changed significantly with travel reliability significantly higher than expected. The four-year targets were easily met.

In contrast to the above, the TTTR Index performance did not meet the predicted target, even with the pandemic. As shown in Figure 10, while TTTR decreased in 2020 to below predicted, the measure rebounded in 2021. Possible explanations for missing the target include that the TTTR is focused on major roads, which experienced higher traffic volumes. In addition, in retrospect it appears the region's target was too ambitious, being largely determined by performance improving (index falling) in years prior to 2018.

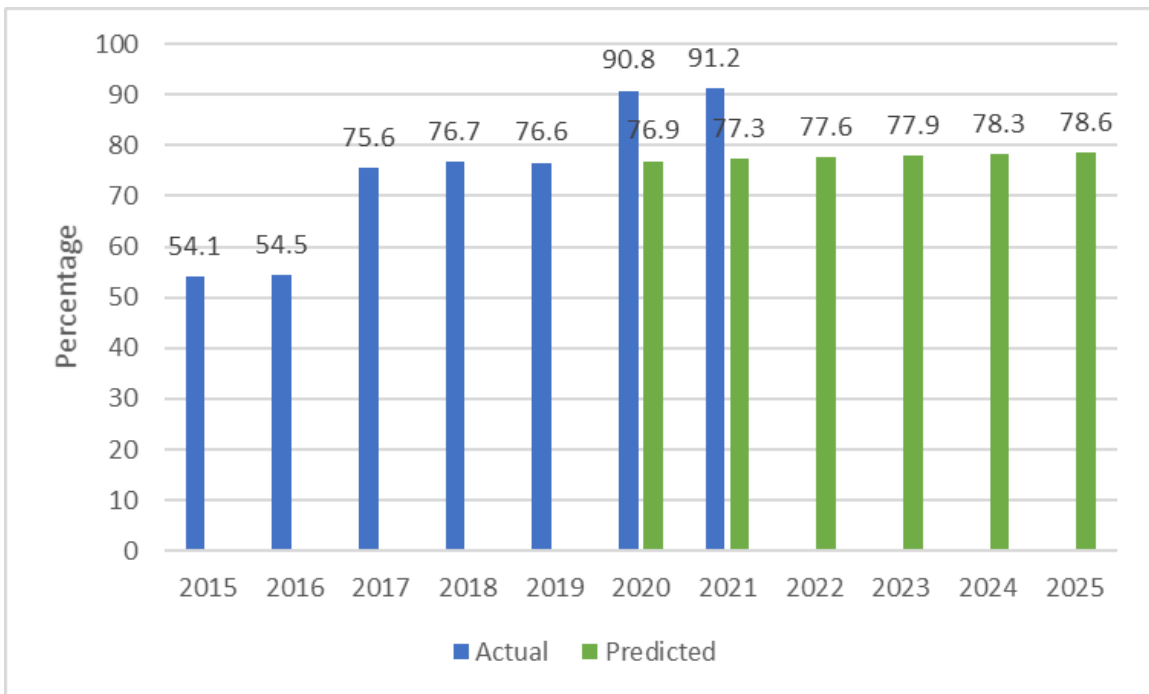
Similar to other graphs in this report, actual performance is shown in blue up through 2020. However, the green forecast performance figures shown annually for years 2020 through 2025 is based on a continuation of pre-pandemic trends. This pre-pandemic extrapolation of performance was used to develop the above targets for the 2022-2025 quadrennial performance period.

Figure 8: TTR (Interstate): Performance vs. Target



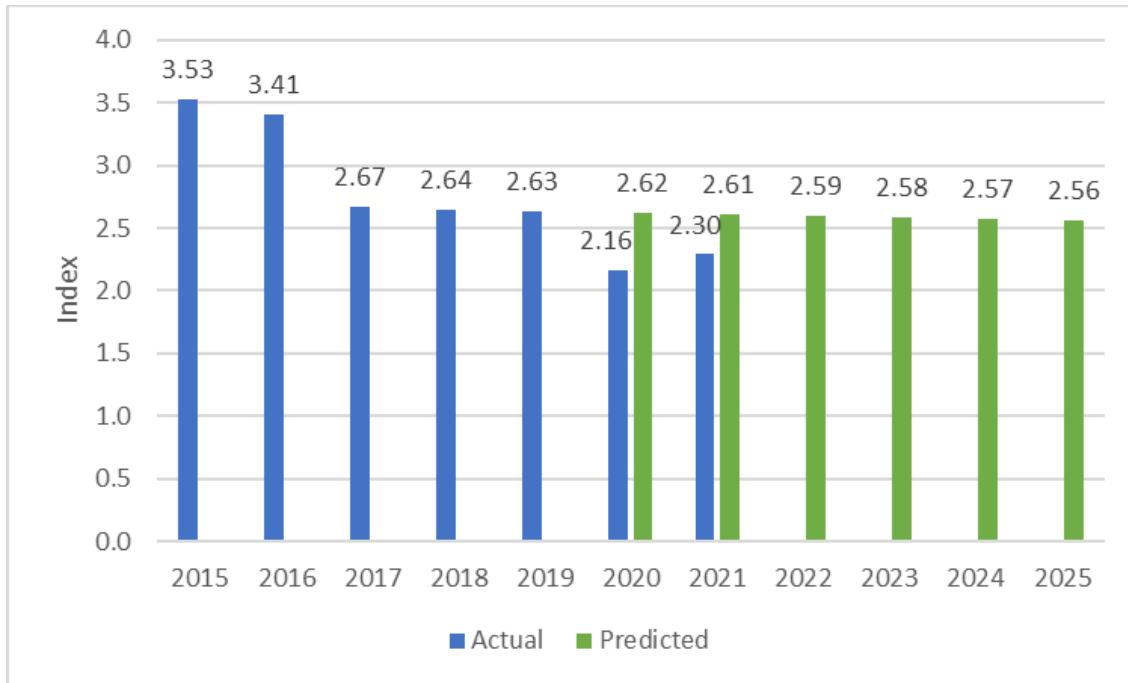
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Desired Direction

Figure 9: TTR (NHS Non-Interstate): Performance vs. Target



↑
Desired Direction

Figure 10: TTR Index: Performance vs. Target



↓
Desired Direction

CMAQ PROGRAM PERFORMANCE

This section summarizes the establishment of the three performance measure targets associated with the Congestion Mitigation and Air Quality (CMAQ) Program. These include unified urbanized area targets for the performance measures of Peak Hour Excessive Delay (PHED) and Mode Share in the area of traffic congestion and targets for the measure of Emissions Reduction for applicable pollutants and precursors for the nonattainment/maintenance area within the TPB planning area boundary.

The targets for the 2018-2021 quadrennial period of performance were approved by the TPB on June 20, 2018 in Resolution R19-2018. The targets met federal requirements and were consistent with the target setting approaches of Maryland, Virginia, and the District of Columbia. Targets for the 2022-2025 quadrennial period of performance were approved by the TPB on June 15, 2022 in Resolution R19-2022.

CMAQ PROGRAM PERFORMANCE MEASURES

The FHWA published the *System Performance: Highway and Freight, Congestion Mitigation and Air Quality (CMAQ)* final rule on January 18, 2017, with an effective date of May 20, 2017. The state DOTs then had one year until May 20, 2018 to set their initial targets. The rule requires states to set targets for three performance measures concerning CMAQ: 1) PHED, 2) Mode Share (Non-SOV), and 3) Emissions Reduction. Table 20 summarizes these three performance measures.

This section covers the two CMAQ Program: Traffic Congestion performance measures and the CMAQ Program: Emissions Reduction performance measure, shown in Table 18. It provides an overview of the measures, data collection, and the methodology utilized for target setting. Additionally, information concerning the CMAQ Program in general is presented, as well as details concerning CMAQ project selection and programming for the states of Virginia, Maryland, and the District of Columbia.

Table 18: Summary of CMAQ Program Performance Measures

Performance Measures	
CMAQ Program: Traffic Congestion	Peak Hour Excessive Delay – Annual hours of peak hour excessive delay per capita
	Mode Share – Percent of Non-SOV Travel on the NHS
CMAQ Program: Emissions Reduction	Emissions – CMAQ-funded projects on-road mobile source total emissions reduction for each applicable criteria pollutant and precursor

CMAQ PROGRAM TARGET SETTING AND COORDINATION

Peak Hour Excessive Delay (PHED)

Applicable state DOTs and MPOs were required to and collectively established a single PHED target for each applicable urbanized area for the first performance period by May 2018. As part of a phased implementation approach, only four-year targets were required for each state DOT's baseline performance period report submitted in October 2018. There was no requirement for states to report two-year targets or baseline condition for the first quadrennial performance period. With the first mid performance period progress report submitted in October 2020, four-year targets could be adjusted, and two-year condition/performance reported as a baseline condition.

After the state DOTs establish their targets, MPOs have 180 days to adopt a target. It should be noted again that this target for the applicable urbanized area must be unified, and applicable DOTs and MPOs should have coordinated and exchanged information with the development of these targets. The applicable urban area for the TPB's metropolitan planning area is the Washington DC-MD-VA Urbanized Area (UZA). The two other urban areas in the TPB's metropolitan planning area, Frederick, MD and Waldorf, MD, are less than 200,000 population, for which the requirements are not applicable. Future growth or redefinition of their urban areas could lead to future target-setting requirements for those urban areas.

Mode Share (Non-SOV)

Applicable State DOTs and MPOs must collectively establish a single, unified two-year and four-year mode share target for each applicable urbanized area for the first four-year performance period. The baseline report for the first performance period was submitted in October 2018 and included two and four-year targets and a description of the data collection method used. After the states established their targets in May 2018, MPOs had 180 days to adopt a target. As with the PHED measure, the Mode Share target for the applicable urbanized area must be unified, and both DOTs and MPOs should have coordinated and exchanged information with the development of these targets. The applicable urban area for the TPB's metropolitan planning area is the Washington DC-MD-VA Urbanized Area (UZA).

Emissions Reduction

State DOTs, with coordination from the MPO, must establish statewide two and four-year targets for total emissions reduction of on-road mobile source emissions for each performance period for all nonattainment and maintenance areas within the state boundary, for each applicable criteria pollutants and precursors. For the first four-year performance period, state DOTs set targets by May 2018 and targets were submitted to FHWA in October 2018. MPOs, in coordination with state DOTs, must similarly establish two and four-year emissions reduction targets for all nonattainment and maintenance areas within the metropolitan planning area. Targets are to be set within 180 days after state DOTs have set their targets. In both cases, the targets shall reflect the anticipated cumulative emissions reductions to be reported by state DOTs in the CMAQ Public Access System (PAS) for CMAQ projects included in the Statewide Transportation Improvement Program (STIP).

The applicable nonattainment area is the Washington DC ozone nonattainment area. Emissions reduction targets must be set for this area, which also includes Calvert County, Maryland. However, the county is not part of the TPB planning area. Maryland DOT takes the lead on developing and setting emission reductions targets for Calvert County.

It is important to note that in contrast to all other performance measures and targets, the emissions reductions targets are measured for the federal fiscal year (October 1 – September 30) to align with the data in CPAS. In addition, the emissions reductions performance is measured cumulatively, with two-year targets summing all emissions reductions achieved across two years and four-year targets summing all emissions reductions achieved across the full four years of the performance period.

MPO COORDINATION WITH STATE DOTs

MPOs are required to establish their performance targets in coordination with their state partners and these targets should be data-driven and realistic. The requirement for these targets to be evidence based and predictive of anticipated outcomes does not supersede or diminish any aspirational targets to which local, regional, or state jurisdictions are committed. Coordination is essential between the MPO and state DOTs in setting the CMAQ Program targets. Both are to work together to share data, review strategies, and understand outcomes.

TPB staff worked in close coordination with the DDOT, MDOT and VDOT in the development of the quadrennial performance targets, shown for the two periods to data in Table 19. The TPB and these state DOTs also signed Letters of Agreement (LOAs) which detail the guidelines and expectations in terms of coordination on data sharing and the development of these targets. This is in accordance with 23 CFR 450.208 which sets forth the requirements for coordination between applicable states and MPOs.

Table 19: CMAQ Program Performance Measure Targets, for the 2018-2021 and 2022-2025 Performance Periods

Performance Measures	CY 2018 – 2019 Two Year Target	CY 2018 – 2021 Four Year Target	CY 2022 – 2023 Two Year Target	CY 2022 – 2024 Four Year Target
Peak Hour Excessive Delay (PHED)	n/a	26.7 Hours	22.5 Hours	22.7 Hours
Mode Share (Non-SOV)	36.9%	37.2%	37.4%	37.7%

PHED AND MODE SHARE TARGET SETTING APPROACH

In developing a method that could be utilized for the target setting of these two performance measures, TPB staff followed a similar approach to that used for the travel time reliability (TTR) performance measures as described in the previous section, averaging factors from the TPB Travel Demand Model and an extrapolation of past performance.

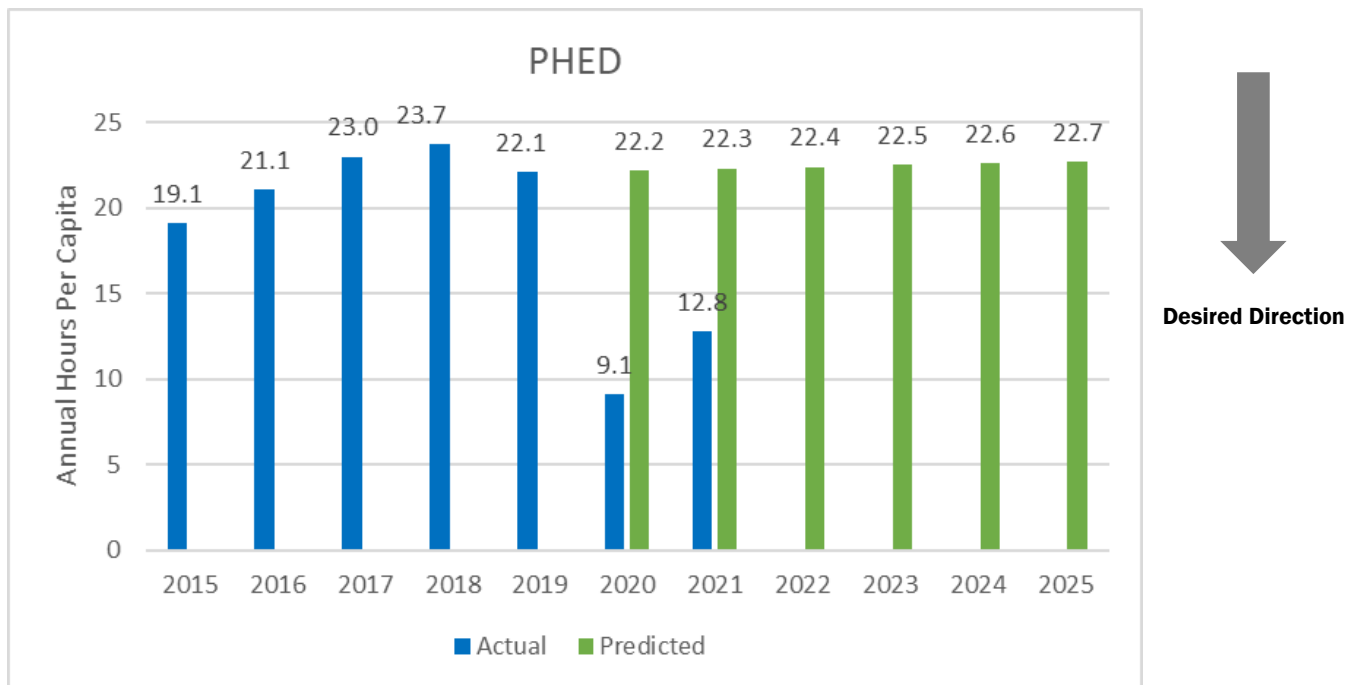
Peak Hour Excessive Delay (PHED)

PHED is based on the calculation of all segments of the NHS. PHED is defined as the extra amount of time spent in congested conditions defined by speed thresholds that are lower than a normal delay threshold. For this measure, the speed threshold is 20 mph or 60% of the posted speed limit, or whichever is greater. The FHWA requires that the data collected must occur during the weekdays (Monday through Friday), with a required morning peak timeframe of 6:00AM – 10:00AM, and a choice between two evening peak timeframes: 3:00PM – 7:00PM or 4:00PM – 8:00PM. TPB staff selected the earlier PM peak (3:00PM – 7:00PM) for all calculations; the same PM peak is also being used by the coordinating state DOTs. Data was collected for the region from the NPMRDS, using the INRIX data available in the RITIS widget.

Figure 11 shows PHED actual performance data in blue bars, with predictions from 2020 forwards shown in green bars. Actual performance for the PHED measure was similar to that of travel time reliability with the impacts of the pandemic evident. Actual performance in 2020 and 2021 was significantly below target; the four-year target was accordingly met.

The predictions for 2020 forward are based on an extrapolation of pre-pandemic conditions. This methodology was used to set the two-year (2023) and four-year (2025) targets for the second performance period, presuming a return in travel conditions to pre-pandemic as well as forecast economic and programmed transportation network changes.

Figure 11: PHED Performance and Forecasts



Mode Share (Non-SOV)

Mode Share is a calculation of the percent of Non-SOV Travel within the urbanized area. Non-SOV Travel, defined by the FHWA, applies to travel occurring on modes other than driving alone in a motorized vehicle and includes travel avoided by telecommuting. It is a measure of the percentage of all surface transportation occurring in an urbanized area. For the first performance period the requirement applied to urbanized areas with a population of at least 1 million; for the second performance period to urbanized areas with a population of 200,000 or more. For the TPB region, only the Washington DC-MD-VA Urbanized Area (UZA) currently meets this level. Future changes to the urban areas defined by the US Census Bureau could eventually lead to the requirement applying to the Frederick, MD and Waldorf, MD urban areas, both in the TPB region but with populations of less than 200,000.

The FHWA provided three data collection models as a means of estimating the required performance targets. Model A allows use of the U. S. Census Bureau's American Community Survey (ACS) data found in the table titled "Journey to Work." Model B allows for data collected from localized surveys. Model C involves estimating the percent of non-SOV based on volume measurements of actual use for each mode of transportation, including telework. For purposes of the TPB region's performance measure development, Model A was utilized.

In selecting this model, explicit guidelines are detailed on how to utilize the ACS data. Data is to be obtained from the "Journey to Work" dataset, labeled *DPO3*. These data sets contain the five-year estimates of the economic characteristics of those surveyed. Within, this dataset is a breakdown on how people commute to work, either by driving alone (SOV) or car-pooling, public transportation, walking, other means, or working at home (Non-SOV).

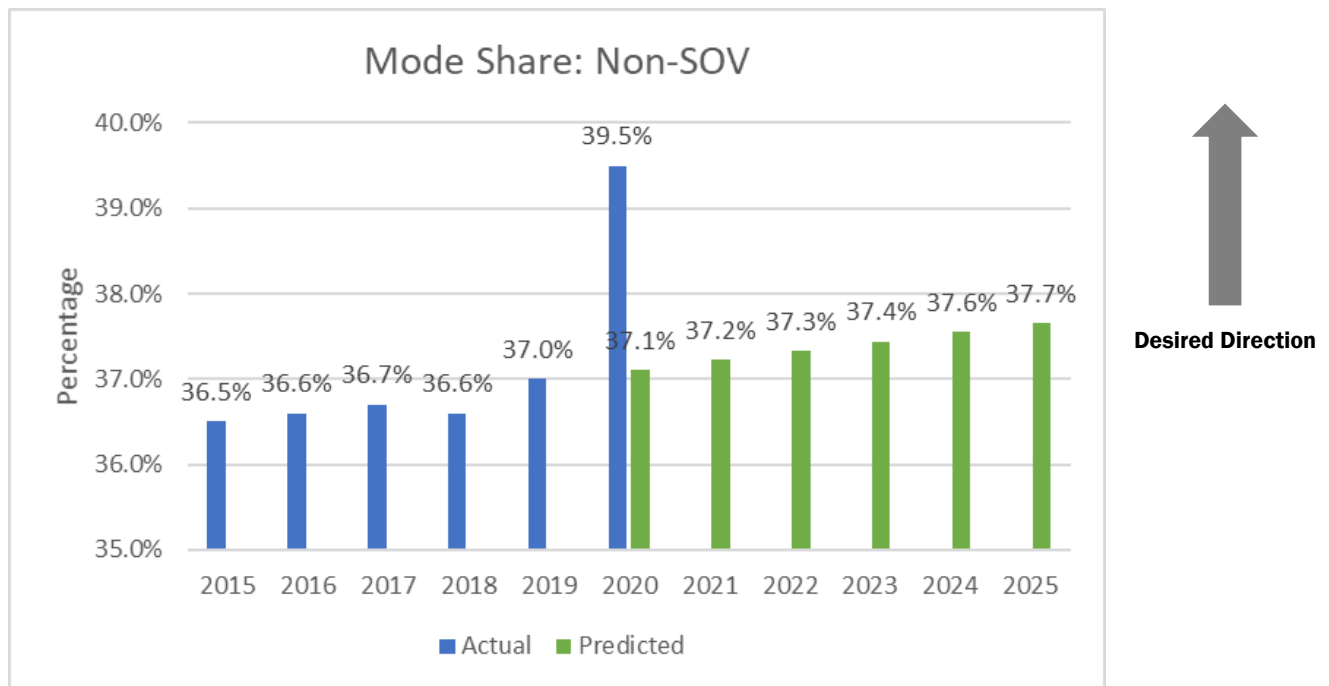
The data in Figure 12 was created from the "Journey to Work" *DPO3* dataset. Until the 2016-2020 dataset, there had not been significant change in the rate of SOV or Non-SOV travel within the Washington UZA. The impact of the pandemic on travel in 2020 is the most likely factor in this change. It will not be until early 2023 when the 2021 five-year dataset is published that it will be known how actual performance compares to the target established in 2018.

The TPB was responsible for setting both two-year (2018-2019) and four-year (2018-2021) unified targets with DDOT, MDOT, and VDOT. In determining the unified targets for both two and four years, there is no formula or calculation specified. The FHWA only requires estimations for target projections. TPB staff developed forecasts and targets using the averaging method previously described, combining recent performance trends with the short-term predictions of the TPB's travel demand model.

Figure 12 shows Mode Share actual performance data in blue bars, with predictions from 2020 forwards shown by green bars. The impacts of the pandemic on actual performance for the Mode Share measure in 2020 is evident. Data for 2021 is not yet available. Per the latest available data, however, the four-year target was met.

The predictions in green for 2020 forward are based on an extrapolation of pre-pandemic conditions. This methodology was used to set the two-year (2023) and four-year (2025) targets for the second performance period, presuming a return in travel conditions to pre-pandemic.

Figure 12: Mode Share (Non-SOV) Performance vs. Target

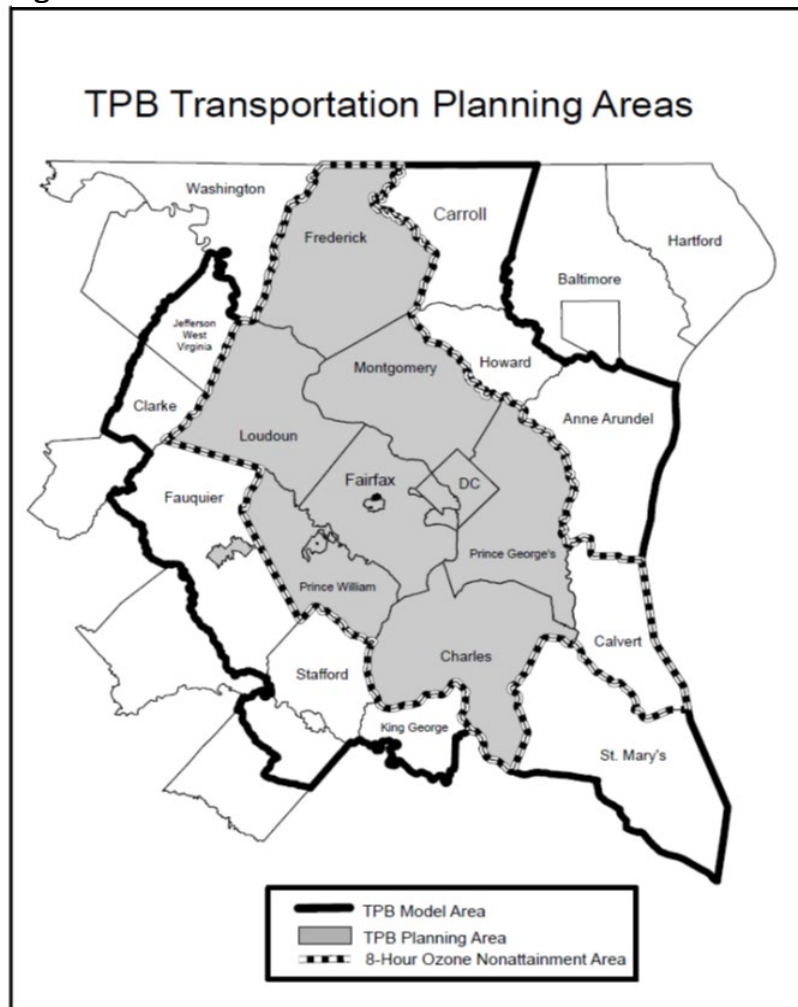


Emissions Reduction

Emissions reduction is defined as the total on-road mobile source emissions reduction for each applicable criteria pollutant and precursor for a nonattainment area. For the nonattainment area in the TPB region, the applicable criteria pollutants are Volatile Organic Compounds (VOCs) and Nitrogen Oxides (NOx). This performance measure applies to projects that receive or are programmed for CMAQ funding. Data was collected from the CMAQ PAS, as specified in the federal rulemaking. State DOTs report emissions reductions information in the PAS for CMAQ funded projects in their Statewide Transportation Improvement Program (STIP).

It should be noted that the regional nonattainment area includes Calvert County; however, this county is not part of the TPB planning area. MDOT and Calvert County are conducting a separate performance measure analysis for emissions reduction for that portion of the nonattainment area. The TPB Ozone Nonattainment Area is shown in Figure 13.

Figure 13: TPB Ozone Nonattainment Area



FEDERAL REQUIREMENTS FOR CMAQ PROJECT FUNDING

The CMAQ program supports two important goals of the U.S. Department of Transportation: improving air quality and relieving congestion. While these goals are not new elements of the program, they were strengthened in SAFETEA-LU and further bolstered in provisions added to the MAP-21. Growing highway congestion continues to rise at a faster rate than transportation investments. Reducing congestion is a key objective of federal surface transportation policy, and one that has gathered increasing importance in the past several years. The costs of congestion can be an obstacle to economic activity. In addition, congestion can hamper quality of life through diminished air quality, lost personal time, and other

negative factors. Accordingly, the CMAQ Program includes federal funds programmatically allocated to each state for funding applicable projects.

The state DOTs each receive CMAQ funding and allocate it annually to fund applicable projects. Each state follows its own selection process for identifying and funding CMAQ projects; for Maryland and Virginia many such projects are funded elsewhere in the state than the TPB planning area. Projects are selected on various criteria, only one of which is estimated emissions reduction benefits. Projects are not required to have quantifiable emissions reduction benefits; a qualitative assessment is sufficient. All projects awarded annually must be entered into the CMAQ Public Access System (PAS). Data for the CMAQ Emissions Reduction performance measure for the region is taken from the quantified benefits included in the projects listed in the PAS that have been funded in the region. Further information on each state's CMAQ project process and methodology for forecasting future performance and setting targets follows.

CMAQ PROJECT PROGRAMMING

Three state jurisdictions share the Washington DC-MD-VA Ozone Nonattainment area. All three of these states have different internal processes concerning the selection and programming of CMAQ projects. These separate processes are detailed as follows.

Maryland

The Maryland Consolidated Transportation Program (CTP) is a six-year capital budget for transportation projects, where CMAQ programming is determined during the one-year development process. CMAQ projects are selected for programming based on criteria provided by the CTP. Projects should meet all federal and legal requirements; support departmental program priorities; meet all federal match requirements to maximize federal revenue; support State plans and objectives; support existing project commitments and uphold intergovernmental agreements; and support alternative modes of transportation (transit, bike, pedestrian). Projects selected for programming must be included in the STIP and must also be consistent with local plans and be included in the regional MPO long-range plan.

In the past, a majority of the CMAQ funding in Maryland has been used for transit projects (bus replacements, MARC, and light rail). CMAQ funding has also been used for park and ride projects, traffic flow improvement projects, such as signal synchronization and the Coordinated Highways Action Response Team (CHART) program.

Virginia

Within the region, the Northern Virginia Transportation Authority (NVTA) coordinates Northern Virginia's annual programming of federal CMAQ projects as well as Regional Surface Transportation (RST) funds. CMAQ funds contribute to the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS).

The recommendation of programming is done through the NVTA's Regional Jurisdiction and Agency Coordinating Committee (RJACC). Final approval is given by the Commonwealth Transportation Board (CTB). VDOT provides local matches for approved CMAQ projects, but only if the project utilizes the

funds within an established timeline. Recipients have 24 months to obligate the funds and then 48 months to expend the funds. CMAQ projects are eligible for potential funding after an application submission, a Transportation Emissions Estimation Models (TEEM) worksheet submittal for air quality benefit calculation, and a resolution of support from the respective governing bodies. VDOT encouraged the use of the FHWA CMAQ calculator tool kit for all applicable project types.

District of Columbia

DDOT does not have any additional steps in determining CMAQ programming beyond the federal requirements. In the past, a majority of the CMAQ programs that have been selected for funding have involved bike lanes and TDM programs.

REGIONAL EMISSIONS REDUCTIONS TARGETS

In developing the performance period emissions reduction performance targets, TPB staff summed the forecast emissions reduction benefits forecast by each state for CMAQ projects planned in the region. The combined emissions reduction was then used to set the two-year and four-year targets for the two applicable pollutants, shown in Table 20 for both performance periods. It should be noted that besides being cumulative targets, in contrast to other performance measures, the emissions reductions measures are based on calculated data for emissions reductions; not on any external or actual field source data. Again, in contrast to other performance measures.

Figures 14 and 15 include the data submitted in CPAS by the three State DOTs as of the time of this report for VOCs and NOx emissions reduced. CMAQ emissions reductions are cumulative. The projects submitted into CPAS for the 2018-2021 performance period had quantitative estimates that considerably exceeded the cumulative two-year and four-year targets set in 2018.

For the FFY 2022-2025 performance period, the emissions reduction targets are approximately four times larger in magnitude. The anticipated increases in emissions reductions are based on the programmed CMAQ projects for the region. With emissions reductions targets being set, the types of projects being funded and the supporting quantitative calculations of emissions reductions are expected to be that much larger in the second performance period.

Table 20: Targets for Emissions Reduction in the TPB Planning Area for the 2018-2021 and 2022-2025 Performance Periods

Total Emissions Reductions for the TPB portion of the Washington DC -MD-VA nonattainment area	Volatile Organic Compounds (VOCs)	Nitrogen Oxides (NOx)
FFY 2018 - 2019 Two Year Target	1.838 Kg/Day	4.019 Kg/Day
FFY 2018 - 2021 Four Year Target	2.195 Kg/Day	4.703 Kg/Day
FFY 2022 - 2023 Two Year Target	0.610 Kg/Day	2.830 Kg/Day
FFY 2023 - 2025 Four Year Target	9.408 Kg/Day	21.117 Kg/Day

Figure 14: 2018-2021 CMAQ Emissions Reduction Performance for VOCs

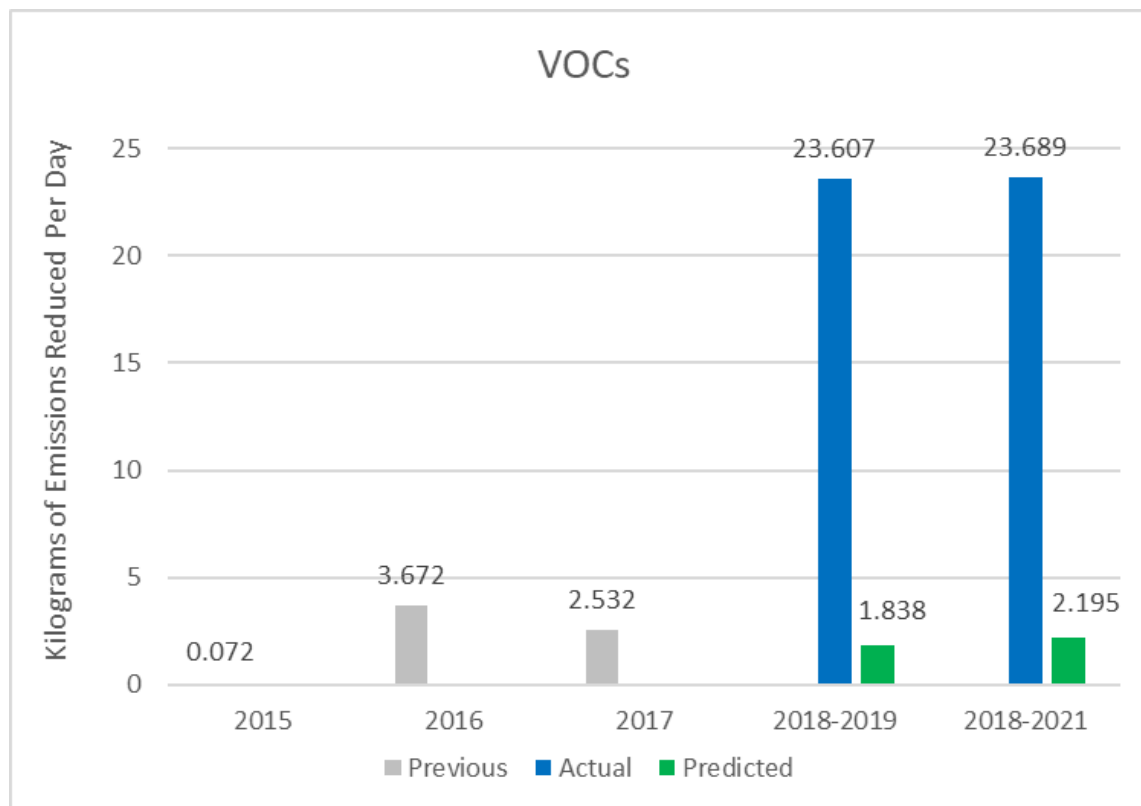
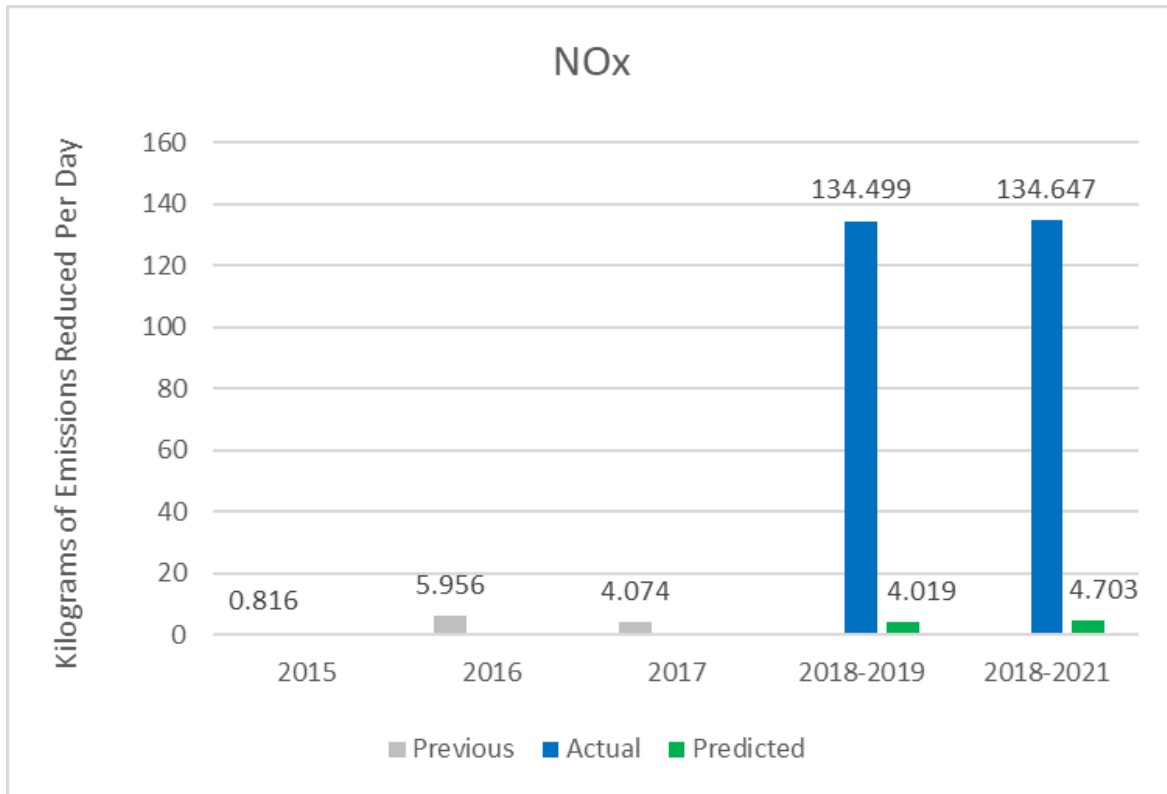


Figure 15: 2018-2021 CMAQ Emissions Reduction Performance for NOx



TRANSIT ASSET MANAGEMENT PERFORMANCE

This section presents the transit asset management (TAM) targets adopted by the National Capital Region Transportation Planning Board (TPB) for 2022. The final Transit Asset Management rule was published in the Federal Register on July 26, 2016 and became effective October 1, 2016.³ Transit asset management (TAM) is “a strategic and systematic process of operating, maintaining, and improving public transportation capital assets effectively through the life cycle of such assets.”

Under the final TAM rule, transit providers must collect and report data for four performance measures, covering rolling stock, equipment, infrastructure, and facility condition. For these measures, transit providers have to annually set targets for the fiscal year, develop a four-year TAM plan for managing capital assets, and use a decision support tool and analytical process to develop a prioritized list of investments.

Each provider of public transportation was required to adopt annual targets for the performance of their transit assets, initially by January 1, 2017. Subsequently, MPOs have 180 days to adopt transit asset targets for their metropolitan planning area to comply with requirements.

TRANSIT ASSET PERFORMANCE MEASURES

As shown in Table 23, there are four transit asset performance measures, two of which are age-based and two of which are condition-based:

1. Rolling stock (Age)
2. Equipment: (non-revenue) service vehicles (Age)
3. Infrastructure: rail fixed-guideway track, signals, and systems (Condition)
4. Stations/Facilities (Condition)

Within each of the performance measures, assets are further divided into asset classes. For example, distinct asset classes for buses can be articulated buses, standard buses, or minibuses. Each asset class is measured separately for performance and for target-setting.

For the age-based performance measures, providers set their own standard – the useful life benchmark (ULB) – for each asset class. The ULB is the anticipated useful lifetime of the asset. Accordingly, each provider in the region can set a different standard for its buses as well as different targets for the anticipated percentage of buses that will exceed those standards, to reflect different degrees of usage and operating conditions, variations in maintenance efforts, etc. This affects the feasibility of comparison among agencies and the integration of data to measure regional performance and set regional targets.

Providers of public transportation measure their performance in accordance with the definitions and requirements of federal rulemaking, including the TAM final rule and the final rule on National Transit Database (NTD) Asset Inventory Reporting. The FTA also published a Guideway Performance Assessment Guidebook and a Facility Performance Assessment Guidebook to provide guidance to providers of public transportation on how to collect data and measure performance for these assets.

³ <https://www.gpo.gov/fdsys/pkg/FR-2016-07-26/pdf/2016-16883.pdf>

Table 21: Transit Asset Management Performance Measures

	Performance Measure	Asset Classes
Rolling Stock (Age)	<u>Percentage</u> of revenue vehicles within a particular asset class that have <u>met or exceeded useful life benchmark (ULB)</u>	Standard 40' bus, articulated 60' bus, vans, automobiles, locomotives, rail vehicles
Equipment – (non-revenue) service vehicles (Age)	<u>Percentage</u> of vehicles that have <u>met or exceeded</u> their ULB	Cranes, prime movers, vehicle lifts, tow trucks
Infrastructure-rail fixed-guideway track, signals, and systems (Condition)	The <u>percentage</u> of track segments, signal, and systems <u>with performance restrictions</u>	Signal or relay house, interlockings, catenary, mechanical, electrical and IT systems
Stations/ Facilities (Condition)	The <u>percentage</u> of facilities rated below 3 on the TERM scale (i.e., <u>in marginal or poor condition</u>)	Stations, depots, administration, parking garages, terminals

The final TAM rule applies to all recipients and subrecipients of federal transit funds (e.g., Section 53XX funds) that own, operate, or manage capital assets used in the provision of public transportation and requires accounting for all assets used in the provision of public transportation service, regardless of funding source, and whether used by the recipient or subrecipient directly, or leased by a third party.

The federal TAM rulemaking defines two tiers of providers of public transportation. Tier 1 providers are those that operate rail service or more than 100 vehicles in regular service. Tier 2 providers are those operating less than 100 vehicles in regular service. Tier 1 providers must set transit asset targets for their agency, as well as fulfilling other additional reporting and asset management requirements. Tier 2 providers can set their own targets or participate in a group plan with other Tier 2 providers whereby targets are set for the group as a whole. Note that a parent organization can operate several modes of service, such as bus service and paratransit service, that combined exceed 100 vehicles.

REGIONAL TRANSIT ASSET TARGET SETTING APPROACH

The region has seven Tier 1 providers of public transportation as defined in the federal rulemaking:

1. WMATA: Metrorail, Metrobus, MetroAccess
2. District of Columbia: Streetcar, Circulator
3. Fairfax County: Connector, Community and Neighborhood Services
4. Montgomery County: Ride On
5. Prince George’s County: TheBus, Call-A-Bus
6. Potomac and Rappahannock Transportation Commission (PRTC): OmniRide, OmniLink
7. Virginia Railway Express (VRE)

The region has twelve Tier 2 providers as defined in the federal rulemaking, including several small paratransit providers and non-profit providers:

Northern Virginia

1. Alexandria: DASH, DOT
2. Arlington: ART
3. Fairfax City: CUE
4. Loudoun County Transit
5. Virginia Regional Transit (VRT)
6. The Arc of Greater Prince William
7. Every Citizen Has Opportunities, Inc. (ECHO)
8. Endependence Center of Northern VA
9. Weinstein Jewish Community Center
10. Prince William Area Agency on Aging

Suburban Maryland

11. Charles County: VanGo
12. Frederick County: TransIT

All of the Tier 2 providers in the region have chosen to participate in a group plan with their respective state agency: the Maryland Transit Administration (MTA) or the Virginia Department of Rail and Public Transportation (DRPT). Accordingly, there are nine reporting entities in the TPB’s metropolitan planning area.

Providers of public transportation operating within the region but with publicly owned assets based outside of the TPB’s metropolitan planning area, such as MTA Commuter Bus and MARC commuter rail, do not need to be included.

Transit asset management targets for the metropolitan planning region have been developed by collecting the targets and asset data from each provider of public transportation in the region. Targets for the region are calculated by adding the individual agency targets, which takes into account the differences in targets and standards among the individual providers of public transportation. The metric for the performance measures and for the targets is a threshold for the maximum allowed or the observed percentage of assets at or exceeding acceptable standards.

Following the establishment of initial TAM targets by the providers of public transportation in January 2017, the TPB adopted the first set of transit asset targets for the region in June 2017. Initially, TPB staff in consultation and coordination with the region’s providers developed a set of TAM targets for the region that summarized those reported by all agencies in table or matrix format. Subsequent sets of regional TAM targets were adopted for 2019 in February 2019 and for 2020 in February 2020. However, starting in 2019, the regional TAM targets were developed in accordance with the FTA guidance, which suggests that the MPOs adopt a single target for each asset class in the region. The regional targets calculate the total number of each asset class and the associated target based on the targets of each provider of public transportation. Table 22 shows the 2022 TAM targets adopted for the region on March 16, 2022 with Resolution R13-2022.

Table 22: Summary of Providers' 2022 TAM Targets

Reporting Entity	Rolling Stock	Service Vehicles	Rail Infrastructure	Station/ Facility Condition
WMATA	0% Rail, 5% Bus ^a	44% ^c	3.5%	5% ^f
DDOT*	0% Rail, 0% Bus	n/a	5%	0% ^g
Ffx. Co.	10%	10% ^d	n/a	0%
Mont. Co.	5%	50% ^d	n/a	0%
Pr. Geo. Co.*	34%	n/a	n/a	0%
PRTC	11% ^b	25% ^d	n/a	0% ^g
VRE	0%	0% ^e	n/a	0%
Maryland Tier 2 (MTA)	18% ^a	44.0% ^e	n/a	0% ^g
Virginia Tier 2 (DRPT)	15% ^a	25% ^e	n/a	10% ^g

a: 40-foot buses; b: 45-foot buses; c: autos; d: trucks; e: service vehicles; f: passenger, g: maintenance/administrative facilities

* Previous year's data

Table 23 (next page) shows the regional transit asset management targets for the region, which for vehicles are by mode: heavy rail, streetcar, local bus, commuter bus, demand response, etc., for all of each asset class in the region.

Table 23: 2022 Regional TAM Targets

Percentage of revenue vehicles that have met or exceeded useful life benchmark	Regional Assets Total	Regional Target
AB- Articulated bus	95	2.5%
AO- Auto	253	0.0%
BR- Over-the-road bus	214	12.4%
BU- Bus	2616	6.9%
CU- Cutaway bus	112	0.7%
HR- Heavy rail passenger car	866	0.0%
LR- Light rail vehicle	6	0.0%
RL- Commuter rail locomotive	20	0.0%
RP- Commuter rail passenger coach	100	0.0%
VN- Van	693	0.0%
<i>Revenue Vehicle Totals</i>	<i>4975</i>	

Percentage of service vehicles that have either met or exceeded their useful life benchmark		
Automobiles	177	41.8%
Trucks and other Rubber Tire Vehicles	1407	46.7%
Steel Wheel Vehicles	77	25.0%
<i>Service Vehicle Totals</i>	<i>1661</i>	

Percentage of track segments, signals, and systems with performance restrictions (over length in miles)		
CR - Commuter Rail	0	0.0%
HR - Heavy Rail	234	3.5%
SR - Streetcar Rail	5.6	5.0%
<i>Track Segments Totals</i>	<i>239.6</i>	

Percentage of Passenger and Maintenance facilities rated below condition 3 on the condition scale		
Passenger Facilities	113	4.1%
Passenger Parking Facilities	87	4.3%
Maintenance Facilities	106	9.2%
Administrative Facilities	26	8.0%
<i>Facility Totals</i>	<i>332</i>	

TRANSIT SAFETY

The Federal Transit Administration (FTA) published the Public Transportation Agency Safety Plan (PTASP) final rule on July 19, 2018 with an effective date of July 19, 2019, followed by one year for implementation. The PTASP final rule applies to providers of public transportation that are recipients and sub-recipients of FTA Section 5307 funding and that fall under the safety jurisdiction of the FTA. Applicable providers of public transportation are required to develop Public Transportation Agency Safety Plans, which include the process and procedures for implementing Safety Management Systems (SMS); they were required to certify their safety plan by July 20, 2020. In addition, they were required to set initial targets for the four transit safety measures by July 20, 2020 and thereafter annually, following which MPOs must set transit safety targets for the metropolitan planning area within 180 days.

This report includes the 2022 transit safety targets adopted by the TPB with Resolution R4-2023 on December 21, 2022.

TRANSIT SAFETY PERFORMANCE MEASURES

The issuance of the transit safety final rulemaking served as a capstone for a collection of rules making up the Public Transportation Safety Program, including the National Public Transportation Safety Plan Rule which defined the four transit safety performance measures for which providers of public transportation and MPOs have to set targets. These measures include the number and rate of fatalities, injuries, safety events (derailments, collisions, fires, and evacuations), and system reliability (mean distance between major and other mechanical system failures). The measures shown in Table 24 are calculated for each mode:

- Number of Fatalities/Serious Injuries/Safety Events: total number for all providers of that mode.
- Rate of Fatalities/Serious Injuries/Safety Events: total number for all providers of the mode divided by the total number of Vehicle Revenue Miles (VRM) for that mode (reported in rate per 100,000 VRM). VRM are the miles that vehicles are scheduled to be or actually traveled while in revenue service (i.e., doors open to customers, from first stop to last stop).
- Mean Distance Between Failure (MDBF): the total number of VRM for that mode divided by the total number of failures for all providers of the mode.

Table 24: Transit Safety Performance Measures

Performance Measure	
Fatalities	Total number of reportable fatalities and the rate per total vehicle revenue miles by mode
Injuries	Total number of reportable injuries and the rate per total vehicle revenue miles by mode
Safety Events¹	Total number of reportable events and the rate per total vehicle revenue miles by mode
System Reliability	Mean distance between major mechanical failures by mode

1.

Collisions, derailments, fires, or life safety evacuations

When regional targets are established, the TPB must collect data and report the performance outcomes in the long-range transportation plan. The results of this monitoring effort are intended to inform future funding decisions on projects and programs that affect transit safety.

REGIONAL TRANSIT SAFETY TARGET SETTING APPROACH

Transit safety targets for the region are based on those adopted by each applicable provider of public transportation. The following providers of public transportation in the region are required to set transit safety targets in accordance with the PBPP requirements. These targets are required for each mode operated by the provider, including heavy rail, streetcar, commuter bus, bus, and paratransit (demand response).

Regional recipients of FTA Section 5307 funding and the modes they operate include:

- WMATA: Metrorail, Metrobus, MetroAccess
- DDOT: DC Circulator, DC Streetcar
- MDOT-MTA: MTA Commuter Bus
- PRTC OmniRide: commuter bus, local bus, and paratransit

Regional sub-recipients of FTA Section 5307 funding include:

- VanGo (Charles Co.)
- TransIT (Frederick Co.)
- Ride On (Montgomery Co.)
- The Bus (Prince George's Co.)

Note that while local bus systems in Suburban Maryland are sub-recipients of FTA funds through the State of Maryland's Locally Operated Transit Systems (LOTS) funding programs, the local bus systems operated by jurisdictions in Northern Virginia do not receive federal funds and the PTASP rule is not applicable to them. In addition, commuter rail systems including MARC and VRE have their safety regulated by the Federal Railroad Administration (FRA) and the PTASP rule does not apply to them.

The transit safety targets calculated for the region for the performance measures – for each applicable mode of public transportation in the region – are shown in Table 25. These 2022 targets were adopted by the TPB on December 21, 2021 in Resolution R4-2023.

Table 25: 2022 Regional Transit Safety Targets

	Fatalities		Serious Injuries		Safety Events		Reliability
	Number	Rate	Number	Rate	Number	Rate	MDBF
Heavy Rail (HR)	0	0	255	0.29	23	0.04	14,000
Streetcar Rail (SR)	0	0	0	0.00	4	0.27	1,000
Urban Bus (MB)	0	0	268	0.49	404	0.74	10,918
Commuter Bus (CB)	0	0	4	0.06	2	0.03	18,596
Demand Response (DR)	0	0	46	0.24	39	0.20	22,903
Vanpools (VP)	0	0	4	0.04	0	0.00	53,000

Rate - Per 100,000 Vehicle Revenue Miles MDBF = Mean Distance Between Failures

TRANSIT SAFETY DATA FOR THE REGION

In addition to the PBPP transit safety targets, the FTA collects safety and security data monthly from urban reporting transit systems through a module of the National Transit Database (NTD) ⁴. Definitions and criteria have some differences from the federal requirements associated with PBPP as well as more detail than the information used for developing the regional transit safety performance measures targets. All of the transit providers in the region report to the database, including the local bus systems in Northern Virginia.

Table 26 shows the data for the applicable providers in the region by mode, with targets met in green/targets not met in red. Table 27 shows data for all individual providers in the region for fatalities, injuries, and safety events for the years 2017 through 2021 as available from this database, including those in Northern Virginia. However, it is likely from the data in both tables that not all incidents are being reported by local providers.

⁴ <https://www.transit.dot.gov/ntd/data-product/safety-security-time-series-data>

Table 26: Transit Safety Actual Performance vs. Targets for 2021

	Fatalities*		Serious Injuries		Safety Events	
	Number	Rate	Number	Rate	Number	Rate
Heavy Rail (HR)	2	0.002	13	0.016	97	0.12
Streetcar Rail (SR)	0	0	0	0	5	4.68
Urban Bus (MB)	6	0.011	0	0	217	0.43
Commuter Bus (CB)	0	0	0	0	1	0.015
Demand Response (DR)	0	0	0	0	30	0.16
Vanpools (VP)	0	0	0	0	0	0

*excludes suicides.

Table 27: NTD Safety & Security Time Series Data for the Region (2017-2021)

	# Fatalities (exc. suicides)					# Serious Injuries					# Safety Events				
	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021	2017	2018	2019	2020	2021
Heavy Rail (HR)															
MetroRail	0	3	2	3	2	50	56	85	11	13	68	86	99	237	97
Streetcar Rail (SR)															
DC Streetcar	0	0	0	0	0	10	0	0	0	0	1	0	0	0	5
Urban Bus (MB)															
Metrobus	0	0	0	1	6	363	351	349	0	0	211	270	270	84	177
DASH	0	0	0	0	0	0	0	0	0	0	0	0	0	6	2
ART	0	0	0	0	0	7	3	7	0	0	11	4	14	2	2
CUE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fairfax Connector	0	0	0	1	1	15	10	24	0	0	11	23	38	6	27
Transit	0	0	0	0	0	0	0	2	0	0	0	0	1	2	3
VanGo	0	0	0	0	0	10	7	2	0	0	5	2	1	0	2
Ride On	1	1	0	0	0	58	47	30	0	0	39	57	44	17	30
The Bus	1	1	0	0	0	13	30	16	0	0	28	37	15	0	1
PRTC/OmniRide	0	0	0	0	0	1	0	1	0	0	1	1	2	1	2
Loudoun	0	0	0	0	0	1	0	2	0	0	2	0	3	0	0
DC Circulator	0	0	0	0	0	2	3	0	0	0	2	1	0	0	2
TOTAL	2	2	0	2	7	470	451	433	0	0	310	395	388	118	248
Commuter Bus (CB)															
MTA Commuter Bus	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0
PRTC/OmniRide	0	2	0	0	0	7	4	0	0	0	9	8	2	0	1
Loudoun	0	0	0	0	0	1	1	1	0	0	1	3	7	0	0
TOTAL	0	2	0	0	0	8	4	0	0	0	10	8	2	0	1
Demand Response (DR)															
MetroAccess	0	0	0	0	0	50	28	20	0	0	33	20	17	8	28
Charles County	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Frederick County	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0
Prince George's County	0	0	0	0	0	1	0	2	0	0	2	0	3	0	0
PRTC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	52	28	22	0	0	36	20	20	8	30
Vanpools (VP)															
PRTC	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0

APPENDIX: BOARD RESOLUTIONS