**2023-2026 TRANSPORTATION IMPROVEMENT PROGRAM
FOR SOUTHWESTERN PENNSYLVANIA**

APPENDIX 3

Transportation Performance Measurement

Appendix 3: Transportation Performance Management

Introduction

Transportation performance management is a strategic approach to transportation investments that uses system data to make investment and policy decisions to meet national performance goals. The Moving Ahead for Progress in the 21st Century Act (MAP21) and Fixing America's Surface Transportation (FAST) Act established Performance-Based Planning and Programming (PBPP) requirements as part of Transportation Performance Management rules for both highway programs and public transportation. This approach continues with the Infrastructure Investment and Jobs Act (IIJA) enacted in November, 2021.

National transportation goals cover a range of key management issues: highway safety, transit safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, environmental sustainability, and reduced delivery delays (23 U.S. Code Section 150). The legislative framework also establishes performance measure requirements for the National Highway Performance Program (NHPP), the Highway Safety Improvement Program (HSIP), and the Congestion Mitigation and Air Quality (CMAQ) Improvement Program. These performance measure processes are further detailed in 23 CFR Part 490.

National public transportation policy and goals focus on individual mobility and environmental impacts and include related national goals such as air quality, energy conservation, international competitiveness, and individual mobility needs for specific populations such as the elderly, people with disabilities, and the economically disadvantaged. Performance measure requirements related to these national goals are established in two key areas: Transit Asset Management (49 U.S. Code Section 5326) and Public Transportation Safety (49 U.S. Code Section 5329).

State Departments of Transportation, Metropolitan and Rural Planning Organizations (MPOs/RPOs), and operators of public transportation are required by 23 CFR Part 450 to jointly agree upon written provisions to collect and share data, cooperatively develop and update performance targets, and report performance targets and ongoing progress towards attaining the targets.

PennDOT, in cooperation with MPOs/RPOs, has developed a Performance-Based Planning and Programming (PBPP) Procedures document to serve as Pennsylvania's provisions for PBPP roles and responsibilities (March 2019). A joint SPC-PennDOT Written Provisions Acknowledgement letter dated 3/29/2019 establishes cooperatively-developed joint-processes for highway safety performance (PM1), National Highway System performance (PM2), and NHS system performance/freight movement/CMAQ measures (PM3).

Separate processes for Transit Asset Management measures are documented in the Port Authority of Allegheny County Transit Asset Management Plan (PAAC TAM Plan, October 2018) and the Pennsylvania Transit Asset Management Group Plan (PennDOT, September 2018). Written Provision Acknowledgements between SPC, PennDOT and each transit agency in the region have been completed accepting PBPP-based Transit Asset Management roles and responsibilities. In accordance with federal planning provisions, in August 2018, SPC formally acknowledged receipt of the Public Transportation Agency Safety Plans (PTASP) and Safety Performance Targets for the Port Authority of Allegheny County c/d/b Pittsburgh Regional Transit and the Pennsylvania Department of Transportation-developed PTASP's and Safety Targets for Beaver County Transit Authority, Butler Transit Authority, Fayette Area Transportation Authority, Mid-Mon Valley Transit Authority, Washington County Transit Authority, and Westmoreland County Transit Authority, the small urban transit operators and direct recipients of FTA funding for the Pittsburgh Transportation Management Area. SPC formally agreed to support the Safety Targets established in those plans for transit modes: Rail, Bus, Commuter Bus, and Demand Response (Paratransit).

The federal PBPP targets must be integrated with (and consistent with) other performance-based planning efforts undertaken, such as the Pennsylvania Strategic Highway Safety Plan (and Regional Safety Action Plan), the National Public Transportation Safety Plan (and Transit Agency Safety Plans), state and agency transit asset management plans, the Pennsylvania Transportation Asset Management Plan (June 2019), the MPO Congestion Management Process, and the MPO CMAQ performance plan.

The scope of MPO Long-Range Transportation Plan (LRTP) planning requirements is included in 23 CFR 450.324. The MPO LRTP must include required performance measures, performance targets and a system performance report that includes an evaluation of system performance with respect to the performance targets, describing progress in comparison with system performance recorded in previous reports. The SPC LRTP includes performance measures and targets as well as baseline performance data for these measures. The initial system performance report and progress description will be due upon completion of the first scheduled performance period for each measure. The SPC TIP is an important element for achieving SPC performance targets.

The Transportation Improvement Program (TIP) must demonstrate consistency with the LRTP as well as other performance management plans. Projects included in the TIP must be consistent with and reflect the LRTP's investment priorities. The TIP should also provide a description of how the TIP will work toward achievement of the performance targets established in the LRTP and link the performance targets with investment priorities.

In addition to considering PBPP as part of program development, SPC has taken steps to document and share the region's performance measure progress. In 2020, SPC published a standalone TPM webpage on its website https://spctpm-spc.hub.arcgis.com/ that is regularly updated and serves as the go-to resource to find the region's performance measures and condition data. The website serves as a comprehensive PBPP resource and complements the documentation included in the TIP and LRTP. The webpage shares timely data updates, explains TPM and its connection to the federal legislation and the PBPP requirements, and includes key definitions and useful context that clearly explains how SPC and its planning partners collaborate on establishing and updating performance targets. The webpage also includes "useful links" to related planning documents, data sources, and legislation.

Highway Safety Performance Measures

The FHWA final rule for the National Performance Management Measures: Highway Safety Improvement Program (HSIP) and Safety Performance Management Measures (Safety PM) were published in the Federal Register (81 FR 13881 and 81 FR 13722) on March 15, 2016 and became effective on April 14, 2016.

The HSIP Final Rule updates the HSIP regulation under 23 CFR Part 924 to be consistent with MAP-21 and the FAST Act, and clarifies existing program requirements. The Safety PM Final Rule adds Part 490 Subpart B to Title 23 of the Code of Federal Regulations to implement the performance management requirements in 23 U.S.C. 150.

The Safety PM, also referred to as PM1, Final Rule supports the HSIP, as it establishes safety performance measure requirements for carrying out the HSIP and to assess fatalities and serious injuries on all public roads.

The Safety PM Final Rule establishes five performance measures, calculated as five-year rolling averages, to be:

- Number of Fatalities
- Rate of Fatalities per 100 million Vehicle Miles Traveled (VMT)
- Number of Serious Injuries
- Rate of Serious Injuries per 100 million VMT

- Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries

Coordination on Target Setting

Pennsylvania's historic comprehensive approach to the planning and programming process was utilized as a basis for PennDOT and MPO/RPO coordination on the state's safety targets. The coordinated efforts to deliver the Safety Targets began in April 2016 at a Statewide Safety Summit. The Summit focused on a variety of legislative, engineering, technology and behavioral topics.

Efforts continued when staff with representation from PennDOT and MPO/RPOs, including SPC, participated in a Federal Highway Administration (FHWA) Target Setting Peer Exchange in May 2016. At this meeting, participants discussed Pennsylvania data trends, MPO coordination, approval processes, and what it would take to be successful with implementing performance targets in Pennsylvania.

Pennsylvania's current [Strategic Highway Safety Plan (SHSP)](#) was updated in 2022. . It serves as a blueprint to reduce fatalities and serious injuries on Pennsylvania roadways by identifying Priority Emphasis Areas (Lane Departure Crashes, Impaired Driving & Pedestrian Safety) and additional Safety Focus Areas that have the most influence on improving highway safety on all public roads throughout the commonwealth. Using data-driven methods and implementing strategies pertaining to the emphasis and safety focus areas discussed throughout this document will have a high impact on driving down fatalities and serious injuries. The SHSP was developed and will be updated in conjunction with federal, state, local and private sector stakeholders including Pennsylvania's MPOs/RPOs.

SPC, with participation and support from its planning partners, established its first Regional Transportation Safety Action Plan (SAP) in 2015. This plan compared statewide crash trends to regional crash trends and identified regional safety focus areas. This plan also established the region's safety goals, which are to cut fatalities and serious injuries in half in the 25 year period 2006-2030. This plan was updated in 2020 to included incorporation of PennDOT's Highway Safety Network Screening data.

To strengthen communication and coordination efforts, Pennsylvania established a Safety Planning Workgroup with representation from PennDOT, the MPOs/RPOs and FHWA. The group includes technical safety and planning professionals that meet regularly to discuss relative topics such as the SHSP and performance measures. PennDOT and the MPOs/RPOs will continue to utilize the Workgroup to coordinate the state's safety target setting. Information discussed as part of this Workgroup will be shared at annual Statewide Planning Partners Meetings and bi-monthly conference calls.

PennDOT will be responsible for scheduling and conducting Safety Planning Workgroup calls, as well as annual Planning Partners meetings and conference calls where coordination on target setting will occur. MPOs/RPOs, including SPC, will be responsible for ensuring there is adequate representation on the Safety Planning Workgroup. SPC will ensure staff participates in Planning Partners meeting and conference calls to provide input into target setting.

Data Collection and Analysis

Data for the fatality-related measures are taken from the Fatality Analysis Reporting System (FARS) and data for the serious injury-related measures are taken from the state motor vehicle crash database. The VMT are derived from the Highway Performance Monitoring System (HPMS).

PennDOT has collected traffic volumes for approximately 2,500 local highways. This extra traffic volume task for the network screening will also be a benefit for the new Model Inventory of Roadway Elements (MIRE) Fundamental Data Elements (FDE) collection mandate in the FAST Act.

PennDOT is responsible for reviewing the state's crash and fatality data and evaluating it for overall trends. PennDOT will compare these trends to what can be observed at a national level. PennDOT will assess the state

and national trends to determine how they relate to the SHSP Goals and the *National Toward Zero Deaths* initiative.

PennDOT shares both the statewide data and planning region specific findings with the MPOs/RPOs to assist in their decision-making process as to whether they are going to support the state's targets or adopt their own. SPC also evaluates historical regional trends over a 15-year period.

PennDOT evaluated the overall trends for the state's crash and fatality data for the Baseline (2016-2018) and Target (2018-2022) periods. Over the past several years data yielded a downward trend of approximately one percent. This was compared to what was observed at a national level. Nationally these same numbers are rising. In support of the *National Toward Zero Deaths* initiative, there was the desire to be aggressive in trying to further reduce the numbers in Pennsylvania. This coupled with the emerging development of vehicle-assist technology and autonomous vehicles led all involved to the belief that a two percent annual reduction goal was both aggressive and obtainable. Serious injuries are on the rise regionally, statewide, and nationally. In addition, a federal definition change with regard to serious injury data and Pennsylvania's adoption of this change in 2016, resulted in more injuries being documented as serious. Based on these factors, PennDOT established a 0% reduction target for serious injuries statewide.

Upon reaching these conclusions, PennDOT shared both the statewide data and planning region specific data to the MPOs/RPOs to assist them in their decision-making process as to whether they were going to support the state targets or adopt their own.

Safety Targets

In the last two reporting periods (2020 and 2021) SPC has endorsed PennDOT's statewide Safety Performance Target of a 2% reduction for all fatalities and 0% reduction in serious injuries. The following table shows the latest Statewide and Regional Targets.

Table 3-1: Pennsylvania Statewide and Southwestern Pennsylvania Regional Safety Targets

Safety Performance Measure	Statewide Baseline (2016-2020)	Statewide Target (2018-2022)	SPC Target (2018-2022)
Number of fatalities	1,140.6	1,113.7	213.7
Rate of fatalities per 100 million VMT	1.157	1.205	1.151
Number of serious injuries	4,445.6	4,490.8	894.4
Rate of serious injuries per 100 million VMT	4.51	4.86	4.816
Number of non-motorized fatalities and non-motorized serious injuries	761.2	730.1	113.0

PennDOT will include state targets for all five of the safety performance measures as part of the annual Pennsylvania Highway Safety Improvement Program (HSIP) report submitted by PennDOT to FHWA by August 31st of each year. PennDOT will submit the state targets as part of the annual Pennsylvania Highway Safety Plan submitted to NHTSA by July 1st of each year.

Reporting on Progress toward Target Achievement

The 2021 STIP and individual MPO/RPO TIPs were developed to ensure progress toward target achievement. The following has helped to ensure planned HSIP projects help to achieve a significant reduction of traffic fatalities and serious injuries on all public roads:

- Implementing the strategies in the 2022 Strategic Highway Safety Plan (SHSP) through a data-driven safety analysis, and the use of low-cost safety improvements systemwide to support achieving these reductions.

- In January 2017, the HSIP funding site was opened using Microsoft SharePoint. The HSIP funding site provides a single point of communication for all HSIP project eligibility and funding requests. Project applications are reviewed through an approval workflow involving PennDOT District and Central Office safety and planning staff.

- Projects are being planned and completed that were associated with the Intersection Safety Implementation Plan (ISIP) and Roadway Departure Safety Implementation Plan (RDIP).

- In 2017, Pennsylvania began using the PA Regionalized Safety Performance Functions (SPFs) for a statewide network screening of about 20,000 locations. These new evaluations will use the Highway Safety Manual's (HSM) analysis method of Excess Expected Average Crash Frequency with Empirical Bayes (EB) adjustments also known as Potential for Safety Improvement (PSI). This method will use the calculated expected crashes for a location and subtract the predicted crashes for that same location to produce an excess (or PSI) value. The new regionalized SPFs have been added to a Pennsylvania specific HSM analytical tool.

- Pennsylvania sets aside $35 million per federal fiscal year (FFY) of HSIP funds to utilize to advance projects statewide that are evaluated and ranked based on benefit/cost analysis, HSM analysis, fatal and injury crashes, application of systematic improvements, improvements on local roads, and deliverability.

- Given SPC's recent safety target setting, regional efforts are being made to better coordinate and identify in a timely manner additional HSIP opportunities and successful applications as part of the MPO TIP process.

- SPC is organizing a coordinating committee that will meet on a regular basis to accomplish this. The committee will be comprised of safety and programming staff from SPC, PennDOT Districts, PennDOT Central Office, and others. Coordination meetings will include a discussion of crash data retrieved from the Pennsylvania Crash Information Tool and future planned projects. SPC plans to reintroduce a more formal regional HSIP process to this coordinating committee in the near future.

- SPC has integrated a safety evaluation into the project evaluation criteria in all of its discretionary funding programs (CMAQ, TA Set-Aside and SMART).

- SPC has conducted over 40 Road Safety Audits since 2009 that have assisted our PennDOT Districts and other planning partners with identifying safety mitigation for incorporation into potential funding applications and upcoming planned safety projects.

PennDOT will continue to include information on Safety Targets and progress towards meeting these targets as part of annual safety submissions to NHTSA and FHWA. It is expected that FHWA will determine if Pennsylvania has met or made significant progress toward meeting their 2018-2022 HSIP targets in December 2023. Four of

the five measures will need to be met or significantly improved upon. FHWA will utilize 2016-2020 data as a baseline period for assessing significant progress. FHWA will report their findings to PennDOT by March 2024.

TIP Investment in Projects that Improve Safety

The 2023-2026 TIP includes a significant investment in safety projects. In the four-year TIP period over $195 million will be invested in 39 safety projects that will increase the safety of the region's highway and bridge infrastructure. These safety projects include over $7.7 million in railroad crossing safety. Notable 2023 safety projects include (Project ID/MPMS, in parentheses):

- SR 28 Goheenville Dip (69141)
- SR 422 Margaret Road Intersection Realignment (85574)
- Sugar Run Road Intersection Improvement (96659)
- US 119 McClure Road/Kingview Road Interchange (96661)
- I-376 Banksville Interchange (97028)
- Bebout Road /E. McMurray Road Intersection Improvement (109025)
- Valleybrook/Bebout Road Intersection Improvement (109242)
- Donohoe Road/Georges Station Road Intersection Improvement (113823)
- US 30 and Georges Station Road Intersection Improvement (114390)
- SR 30/SR48 Intersection Improvement (116555)
- SR 3021 Safety Improvements (110783)
- US 30 Corridor and Safety Improvements (110900
- District 11 Guiderail Improvements (114242)
- Allegheny County Wrong Way Detection Systems (117911)

Pavement/Bridge Performance Measures

The FHWA final rule for the National Performance Management Measures: Assessing Pavement Condition for the National Highway Performance Program and Bridge Condition for the National Highway Performance Program was published in the Federal Register (82 FR 5886) on January 18, 2017 and became effective on February 17, 2017.

This final rule is the second in a series of three related rulemakings that together establish a set of performance measures for state DOTs and MPOs to use as required by MAP-21 and the FAST Act.

The final rule established performance measures for all state DOTs to use to carry out the National Highway Performance Program (NHPP) and to assess the condition of the following: Pavements on the National Highway System (NHS) (excluding the Interstate System), bridges carrying the NHS that includes on- and off-ramps connected to the NHS, and pavements on the Interstate System. The NHPP is a core federal-aid highway program that provides support for the condition and performance of the NHS and the construction of new facilities on the NHS. The NHPP also ensures that investment of federal-aid funds in highway construction is directed to support progress toward the achievement of performance targets established in a State's Transportation Asset Management Plan (TAMP) for the NHS. This final rule establishes regulations for the new performance aspects of the NHPP that address measures, targets, and reporting.

The pavement and bridge performance measures include:

- Percent (%) of Interstate pavements in Good condition
- Percent (%) of Interstate pavements in Poor condition

- Percent (%) of non-Interstate NHS pavements in Good condition
- Percent (%) of non-Interstate NHS pavements in Poor condition
- Percent (%) of NHS bridges by deck area classified in Good condition
- Percent (%) of NHS bridges by deck area classified in Poor condition

Coordination on Target setting

PennDOT submitted to FHWA a Mid Performance Period Progress Report in October 2020 that included adjustments to their 4-year targets and a determination of significant progress for NHPP targets. SPC adopted on September 24, 2020 PennDOT's updated targets for statewide NHS pavement and bridge conditions (PM-2). To satisfy coordination requirements [23 CFR 490.105(e) (2)], PennDOT has coordinated with Planning Partners in the development of the measures and selection of targets to ensure consistency to the maximum extent practicable.

A Transportation Asset Management Plan Steering Committee was formed in January 2017 and held a series of six meetings through April 2018. The committee is comprised of PennDOT Executive Management, staff from the Federal Highway Administration, the Pennsylvania Turnpike Commission, as well as PennDOT's Engineering Districts, Asset Management Division, Center for Program Development and Management, Bureau of Planning and Research, and Highway Safety and Traffic Operations Division. The committee coordinated the development, submission, and implementation of the Transportation Asset Management Plan (TAMP), and the pavement and bridge condition performance measures.

- A workshop was conducted on October 12, 2017 with PennDOT, Planning Partners and FHWA Pennsylvania Division staff related to fully integrating an asset management approach into decision-making.
- A workshop was conducted on January 11, 2018 with PennDOT and FHWA Pennsylvania Division staff to identify future steps and requirements related to the Transportation Performance Management (TPM) rulemaking.
- PennDOT provided status updates on the development of performance measure data, tools and methodologies to the Planning Partners. On October 18, 2017, PennDOT provided an overview of the performance measures and general approaches for target setting at the Planning Partners fall conference in State College. On a March 20, 2018 conference call, PennDOT provided a status update on the development of baseline measures and targets.
- PennDOT conducted a webinar May 9, 2018 to review the state DOT targets with the Planning Partners.
- PennDOT has developed the Pennsylvania Department of Transportation MAP-21 and FAST Act Performance Management Road Map to provide Planning Partners with a resource on the performance measure requirements and calculations.

PennDOT provides Planning Partners with updated annual PM-2 condition reports for statewide, region, and PennDOT District highway networks in July or August each year. These reports include data on actual condition of roadways and bridges, and any revisions in the forecasted condition targets – PM-2 targets for federal Interstate and NHS performance measures, and for other highway networks as well. The performance data and updated targets identified in Tables 3-5 and 3-6 (below) are based on PennDOT's 2020 PM-2 Report.

By October 2022 SPC is expected to review PennDOT's 2021 Performance Measure Annual Report and either accept PennDOT's updated statewide PM-2 targets or submit targets self-determined by the MPO. SPC's review

will be based on the 2021 PM-2 Annual Report, expected in July or August. Tables 3-5 and 3-6 will be updated again at that time.

Data Collection and Analysis

PennDOT will collect and perform the analysis of the data for the pavement and bridge performance measures.

Pavement

Determining pavement condition requires rigorous data collection. In the past, all PennDOT data was collected for each roadway segment, which are approximately one-half-mile in length. 23 U.S.C. 119 now requires that all distress component information be collected for one-tenth-mile increments. PennDOT and its partners have adjusted their pavement data collection to meet FHWA standards. Data collection at the tenth-mile increment level began in 2017 for cracking, rutting, and faulting and was used in submission of the TAMP.

Pavement performance measures required for FHWA reporting include the following four distress components:

- **International Roughness Index (IRI)** — Quantifies how rough the pavement is by measuring the longitudinal profile of a traveled wheel track and generating a standardized roughness value in inches per mile.
- **Cracking** — Measures the percentage of pavement surface that is cracked.
- **Rutting** — Measures the depth of ruts (surface depression) in bituminous pavement in inches.
- **Faulting** — Quantifies the difference in elevation across transverse concrete pavement joints in inches.

These distress measurements translate to good, fair, or poor condition scores. The following table summarizes the pavement condition metrics for IRI, cracking, rutting, and faulting.

Table 3-2: Pavement Condition Metrics for IRI

Rating	Good	Fair	Poor
IRI (inches/mile)	<95	95–170	>170
Cracking Percentage (%)	<5	CRCP: 5–10 Jointed: 5–15 Asphalt: 5–20	CRCP: >10 Jointed: >15 Asphalt: >20
Rutting (inches)	<0.20	0.20–0.40	>0.40
Faulting (inches)	<0.10	0.10–0.15	>0.15

IRI and cracking apply to both bituminous and concrete pavements, while rutting is exclusively for bituminous and faulting is exclusively for concrete. Each one-tenth-mile pavement section is considered in good condition if all three of its distress components are rated as good, and in poor condition if two or more of its three distress components are rated as poor.

23 CFR part 490.315(a), Subpart C requires that no more than 5 percent of a state's NHS Interstate lane-miles be in poor pavement condition. If the threshold is not met, restrictions are placed on PennDOT's federal funding—specifically, National Highway Performance Program and Surface Transportation Program funds. FHWA has not established a minimum condition for NHS non-Interstate roadways, but requires the state DOT to establish performance targets.

23 CFR 490.313(b)(4)(i) requires the total mainline lane-miles of missing, invalid, or unresolved sections for Interstate System and non-Interstate NHS shall be limited to no more than 5 percent of the total lane miles. A section is missing if any one of the data requirements specified in 23 CFR 490.309 and 23 CFR 490.311(c) are not met or the reported section does not provide enough data to determine its Overall Condition.

Previously collected segment-level data for the years 2013-2016 was quantified and used to determine deterioration rates for each condition. Some assumptions related to significant repairs, segment averages and minor maintenance were included in deterioration. The overall deterioration rate was then increased by 3 percent to reflect the impact of inflation.

The resultant deterioration rates are provided in the following table:

Table 3-3: Pavement Deterioration Rates

Condition	Interstate	NHS Non-Interstate
Faulting (inch)	0.00024	0.00153
Concrete Cracking	0.94%	0.89%
Rutting (inch)	0.00651	0.00890
Bituminous Cracking	0.56%	0.90%

The appropriate deterioration rates were applied to each condition, and values for each tenth-mile increment were determined for the years 2021, 2025, and 2029 if nothing is done. Data from the MPMS for anticipated projects on the Interstate and NHS non-Interstate networks for the next eight years (2018-2029) was compiled. The mileage of the projects that affected pavement condition was determined, and these proportions were projected over the next four-year period (2022-2025) and the following four-year period (2026-2029). Projecting mileage beyond four years provided a better representation of the volume of work to be expected, assuming constant funding while reducing affected miles by 3 percent annual inflation. Given the mileages in good, fair, and poor condition, and the projected programmed miles in each condition, resultant mileages were determined for the years 2021, 2025, and 2029. The mileage with missing data was assumed constant over this duration.

Bridge

The FHWA final rulemaking also established performance measures for all mainline Interstate Highway System and non-Interstate NHS bridges (23 CFR 490 Subpart D) regardless of ownership or maintenance responsibility, including bridges on ramps connecting to the NHS and NHS bridges that span a state border. FHWA's performance measures aim to assess bridge condition by deriving the percentage of NHS bridges rated in good and poor condition by deck area on the NHS.

Separate bridge structure condition ratings are collected for deck, superstructure, and substructure components during regular inspections using the National Bridge Inventory (NBI) Standards. For culvert structures, only one condition rating is collected (the culvert rating). A rating of 9 to 0 on the FHWA condition scale is assigned to each component. Based on its score a component is given a good, fair or poor condition score rating.

The table below summarizes the FHWA scoring system for bridge condition metrics for deck, superstructure, substructure, and culvert components.

Table 3-4: FHWA Scoring System for Bridge Condition

Rating	Good	Fair	Poor
Deck	≥7	5 or 6	≤4
Superstructure	≥7	5 or 6	≤4
Substructure	≥7	5 or 6	≤4
Culvert	≥7	5 or 6	≤4

A structure's overall condition rating is determined by the lowest rating of its deck, superstructure, substructure, and/or culvert. If any of the components of a structure qualify as poor, the structure is rated as poor. 23 CFR 490.411(a) requires that no more than 10 percent of a state's total NHS bridges by deck area are in poor condition.

Several different types of models have been created and run with historic data to determine the level of accuracy of the predictive models based on previous deterioration investigations. The outputs from the best performing models were combined and used in conjunction with historic trends to produce a short-term projection.

State Pavement and Bridge Performance Targets

Table 3-5: State Interstate and Non-Interstate NHS Pavement Targets

Pavement Performance				
Measure	**Baseline 2017**	**Actual 2020**	**2-year Target 2022**	**4-year Target 2024**
% of Interstate pavements in Good condition	67.2 %	70.8%	N/A	60.0 %
% of Interstate pavements in Poor condition	0.4 %	0.7%	N/A	2.0 %
Measure	**Baseline 2017**	**Actual 2020**	**2-year Target 2022**	**4-year Target 2024**
% of non-Interstate NHS pavements in Good condition	36.8 %	34.6%	35.0 %	33.0 %
% of non-Interstate NHS pavements in Poor condition	2.3 %	3.1%	4.0 %	5.0 %

PennDOT's pavement condition targets (its desired state of good repair) for NHS Interstate roadways mirror the federal standard: no more than 5 percent of Pennsylvania's NHS Interstate pavements shall be rated in poor condition.

PennDOT's pavement condition targets are consistent with its asset management objectives of maintaining the system at the desired state of good repair, managing to lowest life cycle costs (LLCC), and achieving national and state transportation goals.

Table 3-6: State NHS Bridge Targets

Bridge Performance

Measure	Baseline 2017	Actual 2020	2-year Target 2021	4-year Target 2023
% of NHS bridges by deck area classified in Good condition	25.6 %	27.9%	N/A	N/A
% of NHS bridges by deck area classified in Poor condition	5.5 %	4.8%	7.0%	7.5%

PennDOT's bridge condition targets are consistent with its asset management objectives of maintaining the system at the desired state of good repair, managing to LLCC, and achieving national and state transportation goals.

Reporting on Progress Toward Target Achievement

PennDOT will need to report on performance at regular intervals. The first State DOT baseline performance period report was due October 1, 2018, for all measures in this rule.

Pennsylvania MPOs/RPOs that include, within their respective geographic boundaries, any portion of the applicable transportation network or area must report baseline conditions, targets and progress toward the achievement of their targets in TIPs and LRTPs adopted after May 20, 2019.

TIP Investment in Projects that Improve Pavement and Bridge Condition

Project selection processes for the SPC 2023 TIP prioritize the selection of projects that will support the achievement of the region's performance targets for non-Interstate NHS pavements and bridges.

The 2023-2026 TIP includes a significant investment in the condition of the region's non-Interstate NHS roadway system, $300 million, with the bulk of the investment ($230 million) focused on roadway preservation projects. This investment will address over 60 segment miles currently in fair or poor condition. A sampling of notable NHS roadway projects (Project ID/MPMS#, in parentheses):

- 2048 William Penn Highway (27225)
- SR2040/Ceco Drive to Brownsville (28025)
- Liberty St, Jefferson Street (88284)
- Indiana Bypass Repair (88615)
- PA 28/Highland Park Interchange (91845)
- Seventh Avenue/W. Eighth Avenue (96559)
- SR 4005-PA954 to Oakland Avenue (100122)
- Charleroi Betterment (105426)
- Midland Beaver Road (109356)
- US 30 Corridor Improvements (110900)
- SR 51 Clairton Boulevard (111571)
- US 422 A15 Concrete Preservation (113645)
- Waynesburg Betterment (113683)
- SR 8 Butler to SR 308 (114789)
- US 422 County Line East (114936)
- SR 8 Butler Plant to Wildwood (115053)

- PA 66 Pavement Preservation (116179)
- SR 8 Northtowne Square to Butler (116590)
- PA 21 East of Waynesburg (117441)

The 2023-2026 TIP includes a significant investment in the condition of the region's non-Interstate NHS bridges, $275 million, with $100 million focused on bridge preservation projects. 18 of these bridges are currently in poor condition, the TIP is investing $125 million to address 184,760 sq. ft. of poor bridge deck area. A sampling of notable NHS bridge projects:
- Tarentum Bridge Ramp A (63306)
- McKeesport Duquesne Bridge (63583)
- Electric Avenue over Falls Run (78232)
- Eight Avenue over Homestead Run (78441)
- PA356 over Pine Run (81751)
- Karns Crossing Bridge (86105)
- Rochester Road Culvert (86105)
- SR 3030 over US 30 (90834)
- Charles Anderson Bridge (91907)
- SR 2040 over Redstone Creek (93507)
- US 119 over Two Lick Creek (95852)
- Tarentum Bridge over NS RR (100624)
- East Washington Street Bridge (100743)
- Mack Park Bridge (105300)
- PA 21 over Toll Gate Run (105306)
- PA 18 Bridge over Beaver River (105441)
- US 40 over Catfish Run (113722)
- PA 88 over Peter's Creek (116204)

System Performance and Reliability Measures

The System Performance and Reliability Measures are used by state DOTs and MPOs to assess the performance of the Interstate and non-Interstate National Highway System (NHS) for the purpose of carrying out the National Highway Performance Program (NHPP) (23 CFR 490 Subpart E); to assess freight movement on the Interstate System (23 CFR 490 Subpart F); and to assess traffic congestion and on-road mobile source emissions for the purpose of carrying out the Congestion Mitigation and Air Quality Improvement (CMAQ) Program (23 CFR 490 Subparts G and H). These system performance measures are collectively referred to as the PM-3 measures.

The PM-3 performance measures include:

- Performance of the National Highway System - Statewide
  - Percent of Person-miles Traveled on the Interstate System that are Reliable
  - Percent of Person-miles Traveled on the Non-Interstate NHS that are Reliable
- Freight Movement on the Interstate System - Statewide
  - Interstate System Truck Travel Time Reliability Index
- Measures to assess the CMAQ Program - MPO Targets
  - Annual Hours of Peak-Hour Excessive Delay (PHED) per Capita

- o   Percent Non-Single Occupant Vehicle (SOV) Travel
- o   On-Road Mobile Source Emissions Reduction for CMAQ-funded Projects

Coordination on Target Setting

Baseline measures and initial statewide 2-year and 4-year targets were due May 20, 2018. SPC was to establish targets for the performance measures no later than 180 days after PennDOT established (or amended in the future) its targets. SPC adopted the statewide system reliability targets and adopted regional targets for the CMAQ Program on September 24, 2018. The establishment of the baseline measures and the initial two and four year targets is documented in the SPC report "*Congestion Mitigation and Air Quality Improvement Program: 2014-2017 Baseline Performance Period Report and 2018-2021 CMAQ Performance Plan*" (SPC, September 2018).

Data Collection and Analysis

PennDOT and SPC have worked to identify and evaluate the data and tools used to produce the baseline performance measures and for reporting on progress in achieving the targets. The University of Maryland CATT Lab RITIS software platform is used to generate the travel time-based measures. Data from the U.S. Census Bureau's American Community Survey (ACS) and FHWA's CMAQ annual reporting system are used for the non-SOV travel and mobile source emissions measures, respectively. Future revisions and modifications to these tools may impact the reported performance measures and established targets.

Performance Measure (PM3) Targets

Due to potential tool enhancements, limited historic information, and the need for additional research to understand the variances and factors influencing each of the performance measures, PennDOT and SPC established conservative targets for the 2018-2021 Performance Period. In some respects, these may be more appropriately referred to as benchmarks. PennDOT and SPC tracked the measures over the first 2-year period. States and MPOs are permitted to adjust their 4-year targets at the midterm of the performance period, representing data through 2019 in a report that was due to FHWA by October 1, 2020. SPC's report "*Congestion Mitigation and Air Quality Improvement Program: 2018-2021 CMAQ Performance Plan 2019 Mid Performance Period Report*" (SPC, September 2020) documents the data collection, analysis and state-MPO coordination that occurred through the first 2 years of the 4-year performance period.

For the three system reliability measures, PennDOT set statewide targets (sub-state targets are optional). MPO baseline reliability measures were provided for information purposes only. PennDOT worked closely with SPC and DVRPC to develop the annual peak hour excessive delay and Non-SOV travel targets and to include the necessary multi-state coordination partners in the target-setting process. The mobile source emission measure targets were produced statewide and by each MPO that is in nonattainment or maintenance of the National Ambient Air Quality Standards. The targets represent the amount of emissions to be reduced per day via projects selected to be funded with regional Congestion Mitigation and Air Quality Improvement (CMAQ) program funds. For the Mid-Performance period report, the 4-year system reliability targets were not adjusted. Nor were adjustments were made to the 4-year targets for peak hour excessive delay and Non-SOV travel. Based on clarified federal guidance, SPC's 4-year emission reduction targets were adjusted in the Mid-Performance Period Plan.

The tables below summarize the 2017 baseline values and initial 2-year and 4-year targets that were established in 2018. Also shown are the actual 2-year values, and the adjusted (if any) 4-year targets.

Table 3-7: Travel Time and Annual Peak Hour Excessive Delay Measures

Travel Time Reliability Statewide	2018 Base Year			2020 Midterm Review	
	Baseline (2017)	2-Year Target (2019)	4-Year Target (2021)	Actual (2019)	Adjusted Target (2021)
Interstate NHS	**89.8%**	**89.8%**	**89.8%**	**89.9%**	**89.5%**
Non-Interstate NHS	**N/A**	**N/A**	**87.4%**	**88.5%**	**87.4%**

Annual Hours of Peak-Hour Excessive Delay Per Capita Pittsburgh Urbanized Area	2018 Base Year			2020 Midterm Review	
	Baseline (2017)	2-Year Target (2019)	4-Year Target (2021)	Actual (2019)	Adjusted Target (2021)
NHS Highway System	**11.1**	**N/A**	**11.8**	**10.1**	**11.8**

Table 3-8: Travel Baseline and Target Values for Non-SOV Travel Measure

Annual Hours of Peak-Hour Excessive Delay Per Capita Pittsburgh Urbanized Area	2018 Base Year			2020 Midterm Review	
	Baseline (2017)	2-Year Target (2019)	4-Year Target (2021)	Actual (2019)	Adjusted Target (2021)
NHS Highway System	**11.1**	**N/A**	**11.8**	**10.1**	**11.8**

Table 3-9: PM-3 Target Values for CMAQ Emission Measures

VOC Emissions Reduction kilograms/day	2018 Base Year			2020 Midterm Review	
	Baseline (2017)	2-Year Target (2019)	4-Year Target (2021)	Actual (2019)	Adjusted Target (2021)
Statewide	302.380	109.460	201.730	231.030	N/A
SPC	150.260	58.060	107.000	66.760	107.000

NOx Emissions Reduction kilograms/day	2018 Base Year			2020 Midterm Review	
	Baseline (2017)	2-Year Target (2019)	4-Year Target (2021)	Actual (2019)	Adjusted Target (2021)
Statewide	971.780	337.700	612.820	936.290	N/A
SPC	724.260	256.110	464.770	152.550	250.000

PM2.5 Emissions Reduction kilograms/day	2018 Base Year			2020 Midterm Review	
	Baseline (2017)	2-Year Target (2019)	4-Year Target (2021)	Actual (2019)	Adjusted Target (2021)
Statewide	25.870	10.760	20.490	143.210	N/A
SPC	16.640	7.010	13.350	6.210	10.000

PM10 Emissions Reduction kilograms/day	2018 Base Year			2020 Midterm Review	
	Baseline (2017)	2-Year Target (2019)	4-Year Target (2021)	Actual (2019)	Adjusted Target (2021)
Statewide	24.780	9.540	N/A	0.000	0.000
SPC	24.780	9.540	17.470	0.000	0.000

CO Emissions Reduction kilograms/day	2018 Base Year			2020 Midterm Review	
	Baseline (2017)	2-Year Target (2019)	4-Year Target (2021)	Actual (2019)	Adjusted Target (2021)
Statewide	1,135.400	567.700	1,135.400	2,969.640	250.000
SPC	569.930	284.970	569.930	133.37	250.000

Reporting on Progress Toward Target Achievement

PennDOT and MPOs are required to report on performance at regular intervals. The initial baseline measures and 2- and 4-year targets were established in September 2018 for the initial 4-year Performance Period (2018-2021). The Mid-Performance Period update was submitted in September 2021 to report progress through 2020 in achieving the targets. The next reports are due in September 2022 to 1) assess if the targets for the 2018-2021 Performance Period were met, and 2) to establish baseline measures and 2- and 4-year targets for the next 4-year Performance Period (2022-2025). Target setting and progress reporting will be repeated for subsequent 4-year Performance periods (i.e., 2026-2029, 2030-2033).

TIP Investment in Projects that Improve Travel Time Reliability, Reduce Travel Delays, and Decrease Vehicle Emissions

The 2023 TIP includes a significant investment in efficiency and operations projects, $220 million, invested in 44 efficiency and operations projects to address traffic congestion, improve travel time and reliability, and reduce traffic delays. An additional $53 million will be invested in new capacity projects at key bottleneck locations in the region. Twenty-four efficiency/operations/capacity projects totaling $162 million are in the region's congestion management corridors. Traffic signal investments total over $54 million on 21 projects, primarily traffic signal upgrades, including SPC's traffic signal program line item. There are 18 intersection improvement projects such as the addition of turning lanes valued at over $178 million. Notable projects that improve roadway efficiency and operations include:

- Pittsburgh CBD Signal Upgrade (63378)
- I-376/Parkway East A.T.M. (94651)
- I-79 at PA 910 Interchange (104328)
- SR 356 Corridor Improvements (106486)
- SR 68 Corridor Improvements (106568)
- LVTIP: Norvelt to Pleasant Unity (108010)
- LVTIP: Pleasant Unity to Airport (108140)
- PA 51-Clairton Boulevard-Adaptive Traffic Signal System (110369)
- West Liberty Avenue ATSPM (110374)
- PA 88 Charleroi CMAQ (110399)
- Penn Avenue Signal Improvement (114288)
- US 30 Hempfield on CMP Corridor 95 (114563)
- City of Pittsburgh SmartSpines (109691)

The SPC CMAQ project solicitation and selection process, which takes place every two years in conjunction with the TIP update, supports the CMAQ Performance Plan and the performance-based programming of federal CMAQ funds allocated to the SPC region. SPC has a long-standing policy to select projects for the CMAQ program that provide the greatest air quality benefit. Candidate projects are evaluated by their ability to reduce emissions, reduce vehicle trips and reduce VMT. Other factors such as project deliverability, potential safety benefits, and consistency with other plans and programs are also evaluated by the CMAQ evaluation process. The following are a sample of projects that were selected to receive CMAQ funds during the 2021 CMAQ process (2023 TIP):

- TMA TDM Programming and Outreach (117268)
- Wilkinsburg Transit Center (117269)
- Port of Pittsburgh Marine & Landside Repower Program (117270)
- Mid Mon Valley Transit Bus Replacements (117949)
- PAAC Transit Access Improvement (117275)
- Traffic Signal System Improvements on US 30 (117949), SR 50 (117274), Frankstown Avenue (117272), SR 19 (117943), SR 8 (117273), SR286 (117274), Jefferson & Cunningham Streets (117264)

Transit Safety Performance Measures

Safety performance management is a critical tool that will support transit providers and FTA in identifying safety concerns and monitoring progress in safety improvements throughout the transit industry. FTA's National Public Transportation Safety Plan (January 2017) established safety performance measures for all modes of public transportation through its multifaceted safety performance framework. The performance measures include:

- Fatalities (total number, and rate per vehicle revenue miles by mode)
- Injuries (total number, and rate per vehicle revenue miles by mode)
- Safety events – accidents, incidents or occurrences (total number, and rate per vehicle revenue miles by mode)
- System Reliability (mean distance between major mechanical failures by mode)

The National Safety Plan requires Transit Service Operators to develop agency-specific Public Transportation Agency Safety Plans that would set performance targets based on the identified national measures. Agencies are permitted to develop additional sub-measures useful for local performance management purposes. Agency Safety Plans would be developed and certified by FTA and agency staff trained and certified through a national-level Public Transportation Safety Certification Training Program.

Performance Targets

In accordance with 49 U.S.C. 5329(d)(1)(E), § 673.11(a)(30), each Public Transportation Agency Safety Plan must include safety performance targets based on the safety performance measures established by FTA in the National Public Transportation Safety Plan.

For the National Public Transportation Safety Plan, FTA is adopting four initial safety performance measures:
- Fatalities
- Injuries
- Safety Events
- System Reliability

Performance measures are broad so that they will be relevant to all public transportation modes - intended to focus transit agencies on the development of specific and measurable targets, as well as the actions each agency would implement to improve their own safety outcomes.

Port Authority of Allegheny County d/b/a Pittsburgh Regional Transit Performance (PRT) Indicators and Targets

PRT performance targets based on the safety performance criteria and state of good repair standards set out in the

Southwestern Pennsylvania Public Transit Providers:
- Port Authority of Allegheny County (PAAC) d/b/s Pittsburgh Regional Transit
- Beaver County Transit Authority (BCTA)
- Butler Transit Authority (BTA),
- Fayette County (FACT)
- Indiana County Transit Authority (IndiGO)
- Mid-County Transit Authority (TACT)
- Mid Mon Valley Transit Authority (MMVTA)
- New Castle Area Transit Authority (NCATA)
- Washington County Transit Authority (WASH)
- Westmoreland County Transit Authority (WCTA)
- ACTA Shared Ride
- Allied Coordinated Transit Services (ACTS)
- Butler County Shared Ride,
- Greene County Shared Ride
- Heritage Community Transportation (HHF)
- SPC CommuteInfo

National Public Transportation Safety Plan will report the following data to the PAAC Board at least annually:

- Fatalities – total number of reportable fatalities and rate per million revenue vehicle miles, by mode, regardless of the cause of the fatality.
- Total Injury Rate – total number of reportable customer and employee injuries and rate per million vehicle revenue miles by mode, regardless of the cause of the injury.
- Safety Events (Rail transit) – total number of reportable events and rate per million light rail vehicle revenue miles.
- Safety Events (Bus) – total number of events and rate per million vehicle revenue miles by each separate mode (bus and paratransit).
- System Reliability – measured as revenue miles operated divided by the number of major mechanical failures.
- Rail Total Injury Rate – the number of injuries to passengers per million revenue miles including injuries on escalators, injuries to transit facility occupants and injuries to passengers onboard trains, regardless of the cause of the injury.
- Bus Total Injury Rate - the number of injuries to passengers per million revenue miles including injuries related to bus collisions and other injuries such as while boarding, alighting and sudden stops, regardless of the cause of the injury.
- Paratransit Total Injury Rate – the number of injuries to passengers and employees per one hundred thousand revenue miles including injuries related to collisions and other injuries such as while boarding, alighting, and sudden stops, regardless of the cause of the injury.
- Bus Collision Rate – the number of preventable and non-preventable bus collisions per million revenue miles.
- Paratransit Collision Rate – the number of preventable and non-preventable vehicle collisions per one hundred thousand revenue miles.
- Bus Pedestrian/Cyclist Incidents – the number of incidents in the calendar year involving pedestrians and cyclists.
- Smoke and Fire Incidents – the number of incidents in the calendar year.
- Suicides – the number of incidents in the calendar year.

Targets

Table 3-10: Rail Transit Performance Measures

MEASURE	ACTUAL NUMBER	PRIOR YEAR RATE	TARGET RATE
Fatalities	0	0	0
Injuries – Total	2	.95	1.0
Safety Events (NTD)	9	4.5	4.3
System Reliability	10,000	XXX	XXX

Table 3-11: Bus Transit Performance Measures

MEASURE	ACTUAL NUMBER	PRIOR YEAR RATE	TARGET RATE
Fatalities	0	0	0
Injuries – Total	80	3.0	3.8
Safety Events (NTD)	68	2.5	3.2
System Reliability	8,000	XXX	XXX

Table 3-12: Paratransit Performance Measures

MEASURE	ACTUAL NUMBER	PRIOR YEAR RATE	TARGET RATE
Fatalities	0	n/a	0
Injuries – Total	30	n/a	0.33
Safety Events (NTD)	34	n/a	0.39
System Reliability	33,064	XXX	XXX

Regional Transit Providers Safety Performance Indicators and Targets

Pursuant to § 673.11(d), each state must draft and certify a Public Transportation Agency Safety Plan on behalf of any small public transportation provider located inside of that particular state.

In accordance with 49 U.S.C. 5303(h)(2)(B) and 5304(d)(2)(B), each state and transit agency must make its safety performance targets available to states and Metropolitan Planning Organizations to aid in the planning process.

Targets are composite regional totals from PTASP Targets for: Beaver County Transit Authority (BCTA), Butler Transit Authority (BTA), Fayette Area Coordinated Transportation (FACT), Mid-Mon Valley Transit Authority (MMVTA), Washington County Transportation Authority (WASH) and Westmoreland County Transit Authority (WCTA).

Table 3-13: Fixed Route (Bus) Transit Performance Targets

Measure	Number	Rate (per 1000,000 Vehicle Revenue Miles)
Fatalities	0	0
Injuries (Total)	2.3	.23
Safety Events	5.5	1.27
System Reliability		4.3

Table 3-14: Paratransit/Demand Response Performance Targets

Measure	Number	Rate (per 1000,000 Vehicle Revenue Miles)
Fatalities	0	0
Injuries (Total)	2.65	.37
Safety Events	6.3	.61
System Reliability		1.6

Transit Asset Management Performance Measures

Transit Asset Management (TAM) is a systematic process that enables public transportation agencies to reach and maintain assets in a State of Good Repair (SGR). TAM planning accounts for the full life-cycle of an asset used for public transportation service, from procurement through operations and maintenance to final disposition.

Basic objectives for the TAM planning model are to:

- Monitor and manage public transportation assets
- Increase reliability and performance
- Establish asset performance measures
- Improve safety

Federal PBPP requirements require the use of certified TAM practices by all recipients of certain types of federal transit funds. For management purposes, transit agencies fall into two basic types based on size and mode. The region has one Tier I agency – Port Authority of Allegheny County d/b/a Pittsburgh Regional Transit. There are 15 Tier II transit service providers.

Port Authority of Allegheny County d/b/a Pittsburgh Regional Transit is a Tier I agency, operating light rail fixed guideway service as well as a fixed route bus system with more than 100 vehicles. Tier I agencies manage their TAM planning functions internally. Planning systems and outputs, including performance measures and targets, are reported and reviewed directly by the Federal Transit Administration (FTA). Port Authority d/b/a Pittsburgh Regional Transit published its Transit Asset Management Plan in October 2018, establishing 20 asset-based performance measures across four investment categories (vehicles, facilities, systems and guideways).

PAAC asset management data and capital needs are much more extensive and complex compared to the region's smaller agencies. PAAC manages its own asset management systems, and also participates in PennDOT's capital planning tool for public transportation providers. SPC and the Port Authority d/b/a Pittsburgh Regional Transit have a formal agreement on sharing public transportation performance data, and an acknowledgement that PBPP processes were cooperatively developed and involved required participants.

There are 15 small Tier II agencies in the region operating fewer than 100 vehicles in either fixed route or non-fixed route modes. Small urban transit agencies can elect to participate in a state-managed TAM Group Plan. Rural and community-based transit agencies as subrecipients of FTA Section 5310 and Section 5311 funding are required to participate in the state-managed Group Plan. All the small transit agencies in the SPC region have established formal cooperative agreements with PennDOT guiding their participation in PennDOT's TAM Group Plan.

PennDOT's TAM Group Plan (September 2018) provides consolidated transit asset management services for both required and elective program participants. The TAM Group Plan fulfills federal PBPP requirements and encourages cooperative communications between participating transit agencies and their respective MPOs. SPC and each of the small transit agencies have separate formal agreements on sharing public transportation performance data, and an acknowledgement that PBPP processes were cooperatively developed and involved

required participants. All the participating transit agencies are responsible for providing extensive data updates on the physical condition of transit assets, working within the PennDOT capital planning tool described below.

PennDOT's Bureau of Public Transportation (BPT) has developed a Capital Planning Tool (CPT) and used it since 2016 to complete a range of asset and performance management activities. Its functions are described in the PennDOT TAM Group Plan:

- Inventory all public transportation system assets
- Collect relevant data on those assets
- Predict asset replacement schedules based on Estimated Service Life (ESL) and asset condition
- Create a four-year capital program for each public transportation system to submit to their regional planning organization for review and approval
- Create an annual capital program for each public transportation system, which becomes an agency's individual capital application in PennDOT's electronic granting system (dotGrants)
- Create an annual statewide public transportation capital program
- Compare statewide capital needs to available funding
- Prioritize statewide capital program decisions based on meeting state of good repair (SGR) targets within available funding

The PennDOT CPT maintains crucial information about every asset type and maintains a complete history of the asset as it ages. Transit agencies record changes in condition, usage, value, depreciation, etc. for the following asset categories:

- **Rolling Stock (Revenue Vehicles)**: Transit agency-owned or leased fixed route & paratransit vehicles, used to provide public transportation
- **Equipment:** Tangible support property having a useful life of at least one year, including all nonrevenue/support vehicles
- **Facilities:** A building or structure that is used in the provision of public transportation, including administration and maintenance, and passenger and parking facilities

Based on CPT data provided by the participating agencies, PennDOT annually updates performance targets for each agency based on two primary elements: prior year's performance, and anticipated/obligated funding levels.

In summary, transit agencies use the PennDOT TAM Plan tool - the CPT - to input information on asset inventories and detailed asset conditions into a statewide transit asset management database. The CPT uses the input data from each agency to generate four-year capital plans and performance targets based on asset-specific state-of-good-repair performance criteria for various categories of vehicles, equipment, and facilities. For the Port Authority d/b/a Pittsburgh Regional Transit, facilities also include systems resources and guideways/infrastructure. These sources inform the development of annual capital programs, which are shared with the MPO for approval and inclusion in the region's TIP. The CPT provides performance measure baseline conditions and informs the annual update of agency performance targets. Performance targets have already taken into account anticipated capital spending based on available transit revenues and CPT-determined prioritization of statewide TAM-based capital needs.

Port Authority d/b/a Pittsburgh Regional Transit uses internal management systems and processes described in its TAM Plan to determine performance targets for its more-extensive set of asset class measures.

Transit Performance Measures and Performance Targets

The Port Authority TAM Plan and PennDOT TAM Group Plan identify the asset management performance measures applying to transit capital investment for the region's 16 transit service providers. Baseline performance has been determined using 2018 data on asset condition and a complete inventory of agency assets. If the performance measure is based on a general asset condition rating, the FTA standard on asset conditions applies.

Table 3-15: FTA Asset Condition Ratings

FTA Condition Rating	Description
5 Excellent	No visible defect, new or near new condition, may still be under warranty
4 Good	Good condition, but no longer new, may be slightly defective or deteriorated, but is overall functional
3 Adequate	Moderately deteriorated or defective, but has not exceeded useful life
2 Marginal	Defective or deteriorated in need of replacement; exceeded useful life
1 Poor	Critically damaged or in need of immediate repair; well past useful life

Port Authority d/b/a Pittsburgh Regional Transit uses FTA standards for Useful Life Benchmarks (ULB) to measure the useful service life remaining for various asset classes. The PennDOT CPT and its performance reports use statewide PennDOT Estimated Service Life (ESL) standards, which are referenced in the TAM Group Plan. The PennDOT standards are acknowledged and approved by FTA for Pennsylvania's PBPP transit use.

TAM performance measure tables for the Port Authority d/b/a Pittsburgh Regional Transit identify for each performance measure actual condition data for 2018 and applicable performance targets for 2019. The performance data will be updated annually; an updated performance target will also be determined based on current conditions and anticipated capital investments. This information will be reported directly to FTA and shared with the MPO as described in the planning agreements.

TAM performance measure tables for statewide small transit agencies are provided from the PennDOT TAM Group Plan. PennDOT CPT output is not yet available for each agency; the performance measures and performance targets represent asset conditions statewide for each investment category or class. Performance measures identify actual condition data for 2017 and applicable performance targets for FY 2018-2019. A Performance Measures Summary is provided on the following pages. The performance data will be updated annually; an updated performance target will be developed through the PennDOT CPT, both statewide and for each agency. PennDOT will report this information to FTA and share it with the MPO along with investment information on priority capital projects anticipated for the following year. An Asset Inventory and Conditions Summary from the TAM Group Plan is also provided for statewide small transit agencies.

Table 3-16: PAAC Vehicle Condition Targets

PAAC Vehicles	PM Description	Target	Actual
Bus	**Useful Life Benchmark (ULB) – 12 years**		
	Average Useful Service Life Remaining	5.0	**5.9**
	Percentage of fleet over ULB	10%	**6%**
Rail (4200)	**Useful Life Benchmark (ULB) – 41 years**		
	Average Useful Service Life Remaining	5.0	**8.0**
	Percentage of fleet over ULB	10%	**0%**
Rail (4300)	**Useful Life Benchmark (ULB) – 31 years**		
	Average Useful Service Life Remaining	5	**17**
	Percentage of fleet over ULB	10%	**0%**
Non-Revenue Vehicles	**Useful Life Benchmark (ULB) – 8 years**		
	Average Useful Service Life Remaining	2.0	**-0.7**
	Percentage of fleet over ULB	20%	**42%**
Non-Revenue Vehicles (other rubber tire)	**Useful Life Benchmark (ULB) – 14 years**		
	Average Useful Service Life Remaining	3.0	**0.2**
	Percentage of fleet over ULB	20%	**49%**
Non-Revenue Vehicles (steel wheel)	**Useful Life Benchmark (ULB) - 25 years**		
	Average Useful Service Life Remaining	5.0	**-4.8**
	Percentage of fleet over ULB	20%	**75%**
Incline Cars	**Useful Life Benchmark (ULB) - 51 years**		
	Average Useful Service Life Remaining	10	**49**
	Percentage of fleet over ULB	0%	**0%**

Table 3-17: PAAC Ancillary Vehicle Condition

PAAC Vehicles	Number	Average Age	ULB	Actual	% over
Bus	725	6.1 yrs	12 yrs	**5.9**	**6%**
Rail (4200)	55	33 yrs	41 yrs	**8**	**0%**
Rail (4300)	28	14 yrs	31 yrs	**17**	**0%**
NRV	225	8.7 yrs	8 yrs	**-0.7**	**42%**
NRV (other)	89	13.8 yrs	14 yrs	**0.2**	**49%**
NRV (steel)	4	29.8 yrs	25 yrs	**-4.8**	**75%**
Incline Cars	2	2 yrs	51 yrs	**49**	**0%**

Table 3-18: PAAC Facility Condition

PAAC Facilities	Performance Measure Description (Weighted aggregate average rating of asset categories 1 to 5)	Target	Actual
Maintenance	Average Condition Rating	2.8	**3.1**
	Percentage rated below FTA condition state 3 (FTA 1 or 2)	≤ 17%	**17%**
Service	Average Condition Rating	2.8	**2.9**
	Percentage rated below FTA condition state 3 (FTA 1 or 2)	≤ 20%	**50%**
Stations	Average Condition Rating	2.8	**3**
	Percentage rated below FTA condition state 3 (FTA 1 or 2)	≤ 10%	**26%**

Table 3-19: PAAC System Condition

PAAC Systems	Performance Measure Description (Weighted aggregate average rating of asset categories 1 to 5)	Target	Actual
Security	Average Condition Rating	2.8	**3.0**
	Percentage rated below FTA condition state 3 (FTA 1 or 2)	≤ 10%	**0%**
Traction Power	Average Condition Rating	2.8	**3.0**
	Percentage rated below FTA condition state 3 (FTA 1 or 2)	≤ 10%	**0%**
Signals	Average Condition Rating	2.8	**3.0**
	Percentage rated below FTA condition state 3 (FTA 1 or 2)	≤ 10%	**0%**
Communications	Average Condition Rating	2.8	**3.0**
	Percentage rated below FTA condition state 3 (FTA 1 or 2)	≤ 10%	**0%**
Revenue Collection	Average Condition Rating	2.8	**3.0**
	Percentage rated below FTA condition state 3 (FTA 1 or 2)	≤ 10%	**0%**

Table 3-20: PAAC Fixed Guideway Condition

PAAC Guideway	Performance Measure Description	Target	Actual
Trackway/Rail	Average Performance Restriction - # miles	<3 miles	**N/A**
	Percentage of trackway with performance restriction	$\leq$ 10%	**N/A**
	Percentage of total linear feet of rail deficiencies	< 1%	**N/A**
	Number of rail deficiencies per 100 foot of rail	< 1	**N/A**
Busway	Average Performance Restriction - # miles	< 2 miles	**N/A**
	Percentage of busway with performance restriction	$\leq$ 10%	**N/A**
	Average condition rating	2.8	**N/A**
Bridges	Average condition rating	2.8	**3.3**
	Percentage rated below condition state 3	$\leq$ 10%	**10%**
	Percentage of structurally deficient bridges ($\leq$ 4)	$\leq$ 10%	**N/A**
Tunnels	Average condition rating	2.8	**3.4**
	Percentage rated below condition state 3	$\leq$ 10%	**0%**
	Percentage rated $\geq$ CS3	$\leq$ 10%	**N/A**
Ancillary Structures	Average condition rating	2.8	**3.5**
	Percentage rated below condition state 3	$\leq$ 10%	**0%**

Small Transit Agency Asset Inventory and Condition Summary (statewide)

Table 3-21: Small Transit Agency Rolling Stock Condition

Rolling Stock (Revenue Vehicles)					
Asset Class	Number	Average Mileage	Average Age	Number met or exceeding ESL	% met or exceeding ESL
AO-Automobile	34	132,567	6	5	15%
BU-Bus	1,052	217,385	7	188	18%
CU-Cutaway	1,025	106,989	4	450	44%
VN-Van	482	119,407	5	297	62%
SV -Sports Utility Vehicle	4	64,724	6	3	75%
Grand Total	**2,597**	**154,283**	**5**	**943**	**36%**

Table 3-22: Small Transit Agency Equipment Condition

Equipment (Non-Revenue Vehicles)					
Asset Class	Number	Average Mileage	Average Age	Number met or exceeding ESL	% met or exceeding ESL
Automobiles	148	54,316	8	57	39%
Trucks and other Rubber Tire Vehicles	5	103,732	15	5	100%
Grand Total	**153**	**55,890**	**8**	**62**	**41%**

Table 3-23: Small Transit Agency Facility Condition

Asset Class	Number	Average Condition on TERM Scale	Number met or exceeding ESL	% met or exceeding ESL
Administrative / Maintenance Facilities	34	3	9	26%
Passenger / Parking Facilities	49	3	10	20%
Grand Total	**83**	**3**	**19**	**23%**

Small Transit Agency Asset Management Performance Summary (Statewide)

Table 3-24: Small Transit Agency Asset Management Targets

Performance Measure	Asset Class	Current Performance	FY 2018-19 Target
Rolling Stock (Revenue Vehicles)			
Age - % of revenue vehicles within a particular asset class that have met or exceeded their Estimated Service Life (ESL)	AO – Automobile	15%	**15%**
	BU - Bus	18%	**18%**
	CU - Cutaway	44%	**44%**
	VN - Van	62%	**62%**
	SV – Sport Utility Vehicle	75%	**75%**
Equipment (Non-Revenue Vehicles)			
Age - % of non-revenue or service vehicles within a particular asset class that have met or exceeded their Estimated Service Life (ESL)	Automobiles	39%	**39%**
	Trucks and other Rubber Tire Vehicles	100%	**100%**
Facilities			
Condition - % of facilities with a condition rating below 3.0 on the FTA TERM scale	Administrative and Maintenance Facilities	26%	**26%**
	Passenger and Parking Facilities	20%	**20%**

System Performance Reports

Federal planning regulations require MPOs to include in their LRTPs a performance-based planning section that includes applicable performance measures, current conditions, performance targets, and a System Performance Report that describes the progress that the MPO is making towards achieving the identified performance measures. While it is too early in the PBPP process to determine progress or performance gaps — baseline data and performance targets have been identified and adopted but formal conditions reports have yet to be produced — a number of observations can be made about existing conditions and targets.

Port Authority d/b/a Pittsburgh Regional Transit:

- Current asset baseline condition is mostly "adequate" or above; in some cases there are no assets in poor or marginal condition. In many cases the remaining useful life of an asset significantly exceeds the next-year target. Performance targets typically provide for some assets, on average, to drop into the "marginal" range. This is a conservative approach that allows for a "learning curve" as the TAM processes mature over time.
- Asset conditions for non-revenue vehicles are in the lower range of the poor rating. The targets, however, show that significant improvement is anticipated within the investment year.

Small Transit Agencies (Statewide):

- Targets here have also been conservatively set, with expected condition in the next year equal to current performance for every TAM performance measure. It will be easy to compare regional transit agencies to these stable statewide averages and performance targets and learn how the state processes work.

TIP Investment in Projects that Improve Transit Asset Maintenance Conditions

Project selection processes for the SPC 2021 TIP prioritize the selection of projects that will support the achievement of the region's transit project sponsors' transit asset maintenance performance targets.

Table 3.25: TIP Investments that Improve Asset Condition

	Port Authority d/b/a Pittsburgh Regional Transit		Small Urban and Rural	
	Funding	# of Projects	Funding	# of Projects
Equipment	$ 60,062,566	3	$ 5,187,307	33
Facilities	$ 317,692,750	5	$ 16,065,760	22
Operating	$ 1,246,727,424	5	$ 172,144,921	25
Rolling Stock	$ 289,936,884	5	$ 41,933,069	20