

PERFORMANCE MEASURES

TRANSPORTATION PERFORMANCE MANAGEMENT

The Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America's Surface Transportation (FAST) Act established new requirements for performance management to promote the most efficient investment of Federal transportation funds. Performance-based planning ensures that the Pennsylvania Department of Transportation (PennDOT) and the Metropolitan Planning Organizations (MPOs) collectively invest Federal transportation funds efficiently towards achieving national goals. In Pennsylvania, the Rural Planning Organizations (RPOs) follow the same requirements as MPOs.

Transportation Performance Management (TPM) is a strategic approach that uses data to make investment and policy decisions to achieve national performance goals. [23 CFR 490](#) outlines the national performance goal areas for the Federal-aid program. The regulations require the Federal Highway Administration (FHWA) to establish specific performance measures for the system that address these national goal areas.

National Goal Areas	
Safety	<ul style="list-style-type: none"> To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
Infrastructure Condition	<ul style="list-style-type: none"> To maintain the highway infrastructure asset system in a state of good repair
Congestion Reduction	<ul style="list-style-type: none"> To achieve a significant reduction in congestion on the National Highway System
System Reliability	<ul style="list-style-type: none"> To improve the efficiency of the surface transportation system
Freight Movement and Economic Vitality	<ul style="list-style-type: none"> To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
Environmental Sustainability	<ul style="list-style-type: none"> To enhance the performance of the transportation system while protecting and enhancing the natural environment
Reduced Project Delivery Delays	<ul style="list-style-type: none"> To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices

Performance Based Planning and Programming

Pennsylvania continues to follow a Performance Based Planning and Programming (PBPP) process, with a focus on collaboration between PennDOT, FHWA, and MPOs/RPOs at the county and regional levels. These activities are carried out as part of a cooperative, continuing, and comprehensive (3C) planning process which guides the development of many PBPP documents, including:

- Statewide and Regional Long Range Transportation Plans (LRTPs)
- Twelve-Year Transportation Program (TYP)
- State Transportation Improvement Program (STIP)
- Regional Transportation Improvement Programs (TIPs)
- Transportation Asset Management Plan (TAMP)
- Transit Asset Management (TAM) Plans

- Pennsylvania Strategic Highway Safety Plan (SHSP)
- Comprehensive Freight Movement Plan (CFMP)
- Congestion Mitigation and Air Quality (CMAQ) Performance Plan(s)
- Congestion Management Process (CMP)
- Regional Operations Plans (ROPs)

The above documents in combination with data resources including PennDOT’s bridge and pavement management systems, crash databases, historical travel time archives, and the CMAQ public access system provide the resources to monitor federal performance measures and evaluate needs across the state. Based on these resources, PennDOT and MPOs/RPOs have worked together to set performance measure targets that guide state and regional investment decisions. Aligning goals and performance objectives across national (FHWA), state (PennDOT) and regions (MPOs/RPOs) provide a common framework for decision-making.



PennDOT, in cooperation with the MPOs/RPOs, has developed written provisions for how they will cooperatively develop, and share information related to the key elements of the PBPP process including the selection and reporting of performance targets. In addition, PennDOT has updated their Financial Guidance to be consistent with the PBPP provisions.

Evaluating 2021-2024 STIP Performance

The Federal Fiscal Year (FFY) 2021-2024 State Transportation Improvement Program (STIP) supports the goal areas established in PennDOT’s current long range transportation plan (PA On Track). These include system preservation, safety, personal and freight mobility, and stewardship. The goals are closely aligned with the national goal areas and federal performance measures and guide PennDOT in addressing transportation priorities.



The following sections provide an overview of the federal performance measures, established targets, and how the FFY 2021-2024 STIP will support target achievement. Attributing projects to specific goal measures is difficult as many projects address multiple goal areas. Over the 4-year STIP, nearly 85% of the total funding is associated with highway and bridge reconstruction, preservation and restoration projects. However, these projects are also anticipated to provide significant improvements to highway safety and traffic reliability for both passenger and freight travel. Through these performance measures, PennDOT will continue to track performance outcomes and program impacts on meeting the transportation goals and targets. Decision support tools including transportation data and project-level prioritization methods will be continually developed and enhanced to meet PennDOT and MPO/RPO needs. Dashboards and other reporting tools will be maintained to track and communicate performance to the public and decision-makers.

Safety Performance Measures (PM1)

Background		
<p>The FHWA rules for the <i>National Performance Management Measures: Highway Safety Improvement Program</i> (Safety PM) and <i>Highway Safety Improvement Program</i> (HSIP) were published in the Federal Register (81 FR 13881 and 81 FR 13722) on March 15, 2016, and became effective on April 14, 2016. These rules established five safety performance measures (commonly known as PM1). Targets for the safety measures are established on an annual basis.</p>		
Data Source		
<p>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 Vehicle Miles of Travel (VMT) are derived from the Highway Performance Monitoring System (HPMS).</p>		
2020 Safety Measures and Targets (Statewide)		
Measure	Baseline (2014-2018)	Target (2016-2020)
Number of fatalities	1,182.0	1,171.9
Rate of fatalities per 100 million VMT	1.169	1.148
Number of serious injuries	3839.6	4,400.3
Rate of serious injuries per 100 million VMT	3.797	4.309
Number of non-motorized fatalities & serious injuries	679.0	781.7
Methods for Developing Targets		
<p>Pennsylvania's historic comprehensive approach to the Planning and Programming process was utilized as the basis for PennDOT and MPO/RPO coordination on the State's safety targets. The targets listed above are based on a 1% reduction, which was derived from the actions listed in the Strategic Highway Safety Plan (SHSP), crash data analysis and the desire to support the national initiative Toward Zero Deaths.</p>		

Progress Towards Target Achievement and Reporting:

PennDOT and the MPOs/RPOs continue efforts to ensure the STIP, regional TIPs, and Long Range Transportation Plans (LRTPs) are developed and managed to support progress toward the achievement of the statewide safety targets. At this time, only the Southwestern Pennsylvania Commission (SPC) has elected to establish their own regional safety targets. All other MPOs/RPOs have adopted the statewide targets.

PennDOT's Strategic Highway Safety Plan (SHSP) serves as a blueprint to reduce fatalities and serious injuries on Pennsylvania roadways and targets priority Safety Focus Areas (SFAs) that have the most influence on improving highway safety throughout the state. Within the SHSP, PennDOT identifies 16 key emphasis areas to improve safety.

SHSP Emphasis Areas in Priority Order			
1. Impaired Driving	2. Seat Belt Usage	3. Improved Infrastructure	4. Speed-Aggressive Driving
5. Distracted Driving	6. Mature Driver Safety	7. Motorcycle Safety	8. Young Driver Safety
9. Safety on Local Roads	10. Pedestrian Safety	11. Improving Traffic Records	12. Truck Safety
13. Incident Response	14. Bicycle Safety	15. Safety in Work Zones	16. Vehicle-Train Crashes

A state is determined to have met or made significant progress toward meeting established targets if the outcome in 4 of 5 performance measures is better than the baseline number. Pennsylvania did not meet the 2018 targets and will be subject to the provisions of the federal rulemaking. This will require PennDOT to submit an implementation plan that identifies gaps, develops strategies, action steps and best practices, and includes a financial and performance review of all federally funded safety projects.

PennDOT continues to provide feedback on statewide and MPO/RPO-specific progress towards target achievement. The progress helps regional MPOs/RPOs understand the impacts of their past safety investments and can guide future planning goals and strategy assessments.

ACTPO TIP:

- *Performance Measure 1 (Safety) data is provided through PennDOT's Pennsylvania Crash Information Tool (PCIT).*
- *Performance Measure 2 (Bridges and Pavements) data is provided in report form from PennDOT.*
- *Performance Measure 3 (Interstate Reliability and Air Quality) data is provided through RITIS and the American Community Survey.*
- *ACTPO works closely with PennDOT Central Office and Engineering District 8-0 Staff to ensure planning consistency with PennDOT's Performance Measure Targets. Engineering District 8-0 Staff are frequently consulted and included as part of ACTPO's planning program to provide guidance and insight into best practices based on PennDOT's strategy for meeting established performance measures.*

Evaluation of STIP for Target Achievement:

The following has helped to ensure that planned projects in the STIP will help to achieve a significant reduction of traffic fatalities and serious injuries on all public roads:

- Each year, PennDOT receives federal funding for its Highway Safety Improvement Program (HSIP). This STIP includes \$405 million of HSIP funding. The Department distributes nearly 70% of this funding to its regions based on fatalities, serious injuries and reportable crashes. In addition, a portion of the HSIP funding is reserved for various safety initiatives statewide.
- PennDOT continues to improve on the methods to perceive, define and analyze safety. This includes integration of Regionalized Safety Performance Functions (SPFs) that have been used to support network screening of over 20,000 locations.¹
- PennDOT continues to identify new strategies to improve safety performance. PennDOT is actively participating in EDC 5 to identify opportunities to improve pedestrian safety as well as reduce rural roadway departures. These efforts will lead new strategies that will be incorporated into the 2021 update of the SHSP.
- Safety continues to be a project prioritization criterion used for selecting other STIP highway and bridge restoration or reconstruction projects. Many of these projects also provide important safety benefits.

¹ For more information on SPFs: <https://www.penndot.gov/ProjectAndPrograms/Planning/Research-And-Implementation/Pages/activeProjects/Safety-Performance-Functions.aspx>

- PennDOT continues to evaluate procedures to help in assessing how the STIP supports the achievement of the safety targets. As HSIP projects progress to the engineering and design phases, Highway Safety Manual (HSM) predictive analyses are completed for the project in accordance with PennDOT Publication 638. The HSM methods are the best available state of practice in safety analysis and provides quantitative ways to measure and make safety decisions related to safety performance. Some HSIP projects on the STIP are in an early planning stage and do not have HSM predictive analyses completed. PennDOT will continue to identify ways to expand the application of HSM analyses to support more detailed assessments of how the STIP is supporting achievement of the safety targets.

ACTPO TIP (PM-1)

- *ACTPO will continue to work with PennDOT Central Office and Engineering District 8-0 and review progress towards achieving the established Statewide Performance Measure Targets on an ongoing basis. This will ensure a continuing, comprehensive, and coordinated approach towards meeting the Performance Measure Targets.*
- *In January 2020, ACTPO approved the Safety Performance Targets set forth by PennDOT. (See attached charts).*
- *Further, ACTPO has identified that, while the PM-1 targets are a good start, a complete safety plan for Adams County will need to consider all types of crashes, including property damage only and not just fatalities and serious injuries. ACTPO will continue to work towards integrating the PM- 1 targets with the full range of crash types through its forthcoming LRTP Update.*
- *ACTPO has \$3,516,000 programmed onto the FFY2021 TIP for safety via HSIP funds. ACTPO and District 8-0 staff will continue to evaluate candidate safety projects using PennDOT's Network Screening Tool, compared those with locally identified safety needs, and evaluated conceptual designs to determine cost/benefit analysis required for inclusion on the TIP.*
- *ACTPO staff is working to analyze publicly available crash data from PennDOT using GIS to incorporate spatial analysis of crashes into the development of the forthcoming LRTP update.*

Pavement/Bridge Performance Measures (PM2)

Background			
The FHWA rule for the National Performance Management Measures; Assessing Pavement 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 rule established six measures related to the condition of the infrastructure on the National Highway System (NHS). The measures are commonly known as PM2. Targets are established biennially for these measures as part of a four-year performance period, the first of which began in 2018.			
Data Source			
Data for the pavement and bridge measures are based on information maintained in PennDOT's Roadway Management System (RMS) and Bridge Management System (BMS). The VMT are derived from the Highway Performance Monitoring System (HPMS).			
2021 Pavement Performance Measure Targets (Statewide)			
Measure	Baseline 2017	2-year Target 2019	4-year Target 2021
% of Interstate pavements in Good condition	67.2 %	N/A	60.0 %
% of Interstate pavements in Poor condition	0.4 %	N/A	2.0 %
% of non-Interstate NHS pavements in Good condition	36.8 %	35.0 %	33.0 %
% of non-Interstate NHS pavements in Poor condition	2.3 %	4.0 %	5.0 %
Bridge Performance Measure Targets (Statewide)			
Measure	Baseline 2017	2-year Target 2019	4-year Target 2021
% of NHS bridges by deck area in Good condition	25.6 %	25.8%	26.0 %
% of NHS bridges by deck area in Poor condition	5.5 %	5.6%	6.0%
Methods for Developing Targets			
Pennsylvania's pavement and bridge targets were established through extensive coordination with a Transportation Asset Management Plan (TAMP) steering committee and workshops with MPOs/RPOs and FHWA's Pennsylvania Division. The targets are consistent with PennDOT's 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. ²			

Progress Towards Target Achievement and Reporting:

PennDOT continues to implement enterprise asset management for programming and decision-making as outlined in the TAMP.³ The tools and methodologies are continually evaluated to prioritize state-of-good repair approaches that preserve transportation system assets. Within the TAMP, PennDOT identifies the following key objectives:

TAMP Objectives

- Sustain a desired state of good repair over the life cycle of assets
- Achieve the lowest practical life-cycle cost for assets
- Achieve national and state goals

PennDOT's analyses pertaining to life cycle management, risk management, financial planning, and any performance gaps culminate in an investment strategy to support the objectives and targets established in the TAMP.

For more information on LLCC: <https://www.penndot.gov/ProjectAndPrograms/Asset-Management/Documents/Lowest-Life-Cycle-Cost-Infographic.pdf>

PennDOT and the MPOs/RPOs continue to ensure the STIP, regional TIPs, and LRTPs are developed and managed to support progress toward the achievement of the statewide pavement/bridge objectives and targets. At this time, MPO/RPOs have not established separate regional pavement or bridge targets. States are permitted to adjust their 4-year targets at the midterm of the performance period, representing data through 2019 in a report due to FHWA by October 1, 2020. In addition, PennDOT continues to provide feedback on statewide and MPO/RPO-specific progress towards target achievement. The progress helps each region understand the impacts of their past bridge and pavement investments and can guide future planning goals and strategy assessments.

ACTPO TIP (PM-2)

- *ACTPO staff works closely with PennDOT Engineering District 8-0 to ensure consistency with Performance Measure 2 targets as established by PennDOT. ACTPO will continue to work closely with District 8-0 on an ongoing basis to ensure planning and project programming is consistent with PennDOT best practices.*
- *Continue to monitor based on annual reports provided by PennDOT.*
- *For PM-2, candidate projects needed to address asset management were matched with regional needs based on the priorities established in the Adams County LRTP. MPO staff worked with District 8-0 staff to address immediate needs and opportunities where they intersected with the LRTP priorities.*

Evaluation of STIP for Target Achievement:

The following has helped to ensure that planned projects in the STIP will help to achieve an improvement in bridge and pavement conditions for the state interstate and NHS roads:

- Nearly 85% of PennDOT's STIP funding is directed to highway and bridge restoration and reconstruction projects. Many of these projects are focused on our state's interstate and NHS roads.
- Pennsylvania's investment strategy, reflected in the statewide 2021 Twelve Year Program (TYP) and 2021-2024 STIP, is the result of numerous strategic decisions on which projects to advance at what time. These decisions are made by many different entities and must be made consistently across the state.
- The TAMP is a 10 year outlook that includes the financial strategy for various work types and is a driver for the TIP, STIP and LRTP development.
- In support of the STIP development, PennDOT and MPOs/RPOs jointly developed and approved General Procedural Guidance and Transportation Program Financial Guidance documents.⁴ The guidance, which is consistent with the TAMP, formalizes the process for MPOs/RPOs and other interested parties as they identify projects, perform a project technical evaluation, and reach consensus on their portion of the program—while meeting asset management targets within the available budget.
- The Procedural Guidance also helps standardize the project prioritization process. The guidance is key to resolving issues between programming to lowest life-cycle cost, managing current infrastructure issues—such as worst-first programming—and risk mitigation. The resulting methodology allows data-driven, asset management-based decisions to be made with human input and insight to achieve maximum performance of the available funds. The guidance document is revised for each STIP cycle as PennDOT's asset management tools and methods evolve and enhance its ability to program to lowest life-cycle cost.

³ PennDOT TAMP: <https://www.penndot.gov/ProjectAndPrograms/Asset-Management/Documents/PennDOT-TAMP.pdf>

⁴ The 2020 Financial Guidance can be found at: www.talkpatransportation.com

- In the short term, candidate projects are defined and the proposed program is compared to Pavement Asset Management System (PAMS) and Bridge Asset Management System (BAMS) outputs to verify that the program is developed to the lowest practical life cycle cost. The percentages of good, fair, and poor can also be projected and compared to PM-2 targets based on the proposed improvements and built-in deterioration models. When PAMS and BAMS are further implemented and in the hands of planners, then the system outputs can be used to select projects. Draft programs can then be analyzed in relation to the PM-2 measures.

ACTPO TIP (PM-2)

- *ACTPO's Long Range Transportation Plan recommends a policy of prioritizing Asset Management projects based on facility conditions (IRI for roads, "Poor" for bridges, etc.) and Roadway Functional Classification. ACTPO and District 8-0 staff work closely to identifying candidate asset management projects based on this criteria.*
- *ACTPO also has an established scoring system to prioritize Local Bridges over 20' for the TIP. This ranking system factors in data on Deck Area, Posted/Closed status, Structural Component Ratings, Overall Condition, Sufficiency Rating and ADT. ACTPO staff works closely with the Adams County Bridge Engineer, Municipal Officials, and District 8-0 staff to identify candidate Local Bridge projects.*

System Performance Measures (PM3)

Background			
<p>The FHWA final rule for the <i>National Performance Management Measures; Assessing Performance of the National Highway System, Freight Movement on the Interstate System, and Congestion Mitigation and Air Quality Improvement Program</i> was published in the Federal Register (82 FR 5970) on January 18, 2017 and became effective on May 20, 2017. This rule established six measures related to various aspects of the transportation system (commonly known as PM3). Targets are established biennially for these measures as part of a four-year performance period, the first of which began in 2018.</p>			
Data Source			
<p>The Regional Integrated Transportation Information System (RITIS) software platform is used to generate all the travel time based measures. Data from the American Community Survey (ACS) and FHWA's CMAQ annual reporting system are used for the non-SOV travel and mobile source emissions measures, respectively.</p>			
Travel Time and Annual Peak Hour Excessive Delay Targets			
Measure	Baseline 2017	2-year Target 2019	4-year Target 2021
Interstate Reliability (Statewide)	89.8 %	89.8 %	89.8 %
Non-Interstate Reliability (Statewide)	87.4 %	N/A	87.4 %
Truck Reliability Index (Statewide)	1.34	1.34	1.34
Annual Peak Hour Excessive Delay Hours Per Capita (Urbanized Area)	DVRPC - 16.8	N/A	17.2
	SPC - 11.1	N/A	11.8
Non-SOV Travel Measure Targets			
Measure	Baseline 2017	2-year Target 2019	4-year Target 2021
Percent Non-Single Occupant Vehicle Travel (Urbanized Area)	DVRPC - 27.9 %	28.0 %	28.1 %
	SPC - 24.8 %	24.6%	24.4 %
CMAQ Emission Targets			
Measure		2-year Target 2019	4-year Target 2021
VOC Emissions (Statewide)		109.460	201.730
NOx Emissions (Statewide)		337.700	612.820
PM2.5 Emissions (Statewide)		10.760	20.490
PM10 Emissions (Statewide)		9.540	17.470
CO Emissions (Statewide)		567.700	1135.400
Methods for Developing Targets			
<p>The System Performance measure targets were developed in coordination with MPOs/RPOs within the state. 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 has established conservative targets. In some respects, these may be more appropriately referred to as benchmarks. PennDOT will track the measures over the reporting period to identify trends and to support future target revisions. Note: The Peak Hour Excessive Delay and Non-SOV measures are only calculated for the urbanized areas. For the first four-year period, it is only the urbanized areas with a population over 1 million (which is Pittsburgh and Philadelphia). In the next performance period (beginning 1/1/2022), this will include urbanized areas with a population over 200,000.</p>			

Progress Towards Target Achievement and Reporting:

PennDOT and the MPOs/RPOs continue efforts to ensure the STIP, regional TIPs, and L RTPs are developed and managed to support progress toward the achievement of the statewide system performance targets. At this time, MPO/RPOs have not established separate regional reliability targets. Regional targets are required for the Congestion Mitigation and Air Quality (CMAQ) delay and emissions measures per the applicability requirements of the federal performance measure rule. States are permitted to adjust their 4-year targets at the midterm of the performance period, representing data through 2019 in a report due to FHWA by October 1, 2020. PennDOT is planning to revise the system performance targets based on new data processing methodologies and will coordinate any updates to the performance measures with the MPOs/RPOs.

PennDOT remains committed to expand and improve system mobility and integrate modal connections despite the large percentage of funding dedicated to infrastructure repair and maintenance. PennDOT's L RTP provides system performance objectives that guide investment decisions. These objectives are measured using multiple performance metrics including the federal systems performance measures.

Long Range Plan
Objectives

- Provide multimodal infrastructure and technology advancements to eliminate bottlenecks and improve system efficiency and trip predictability
- Increase access to jobs, labor, and transportation choices in urban, suburban and rural communities
- Support communities through appropriate and equitable transportation modal options and investments
- Improve first and last mile intermodal access and connections

ACTPO TIP (PM-3)

- *ACTPO will continue to work with PennDOT Central Office and Engineering District 8-0 and review progress towards achieving the established Statewide Performance Measure Targets on an ongoing basis. This will ensure a continuing, comprehensive, and coordinated approach towards meeting the Performance Measure Targets.*
- *Federal and State Guidance for achieving established Performance Measure Targets will be considered and integrated into ACTPO's planning programs.*
- *ACTPO will use safety and available performance measure data in evaluating and updating its congestion management process plan.*

Evaluation of STIP for Target Achievement:

The following has helped to ensure that planned projects in the STIP will help to achieve an improvement in the system performance measures for the statewide interstate and NHS road system:

- PennDOT continues to emphasize their Transportation Systems Management and Operations (TSMO) initiatives to program low-cost technology solutions to optimize infrastructure performance. This has included the development of Regional Operations Plans (ROPs) that integrate with the MPO Congestion Management Process (CMP) to identify STIP projects. A TSMO funding initiative was established in 2018 to further support these efforts. The 2021-2024 STIP includes over \$289 million of funding dedicated to congestion relief projects.

- PennDOT has funded interstate projects to address regional bottlenecks. Mainline capacity increasing projects are limited to locations where they are needed most. These investments will provide significant improvements to mobility that support meeting the interstate and freight reliability targets.
- The statewide CMAQ program provides over \$440 million of funding on the STIP for projects that benefit regional air quality. PennDOT has worked with Districts and MPO/RPOs to develop more robust CMAQ project selection procedures to maximize the air quality benefits from these projects.
- Over \$210 million is provided in the STIP for multi-modal alternatives. This includes funding for transit operating costs, transit and rail infrastructure, support for regional carpooling and other bike and pedestrian infrastructure within the state. These projects provide opportunities to reduce vehicle miles of travel (VMT) and increase the percentage of non-single occupant vehicles.
- At this time, the potential impact of the STIP on PM-3 performance measures cannot be determined. PennDOT continues to monitor the impact of recently completed projects on the reliability and delay measures. As more data is obtained, these insights will help PennDOT in evaluating potential project impacts and in revising future targets and goals.

ACTPO TIP (PM-3)

- *ACTPO's current LRTP pre-dates the PM-3 system performance measures. These measures will be integrated into the forthcoming ACTPO Long Range Transportation Plan update.*
- *ACTPO continues to support the Susquehanna Regional Transportation Partnership (SRTP) Commuter Services program. While ACTPO no longer receives CMAQ funds, \$250,321 in STP funding has been allocated towards the Commuter Services program.*

Transit Performance Measures

In July 2016, FTA issued a final rule requiring transit agencies to maintain and document minimum Transit Asset Management (TAM) standards, policies, procedures, and performance targets. The TAM rule applies to all recipients of Chapter 53 funds that either own, operate, or manage federally-funded capital assets used in providing public transportation services. The TAM rule divides transit agencies (see Appendix 13) into two categories based on size and mode:

- Tier I
 - Operates Rail Fixed Guideway (Section 5337) **OR**
 - Operates over 100 vehicles across all fixed route modes **OR**
 - Operates over 100 vehicles in one non-fixed route mode

- Tier II
 - Urban and Rural Public Transportation (Section 5307, 5310, and 5311 eligible) **OR**
 - Operates up to and including 100 vehicles across all fixed route modes **OR**
 - Operates up to and including 100 vehicles in one non-fixed route mode

The TAM rule requires states to participate and/or lead the development of a group plan for recipients of Section 5311 and Section 5310 funding (Tier II), and additionally allows other Tier II providers to join a group plan at their discretion. All required agencies (Section 5311 and 5310) and remaining Tier II systems in Pennsylvania, except for the Centre Area Transportation Authority (CATA), elected to participate in the PennDOT Group Plan.

The TAM process requires agencies to annually set performance measure targets and report performance against those targets. Required measures are:

- Rolling Stock – Percentage past the Useful Life Benchmark (ULB) (ageonly)
- Equipment – Percentage of service vehicles past the ULB (ageonly)
- Facilities – Percentage of passenger/parking and admin/maintenance facilities that are below a 3 on the Transit Economic Recovery Model (TERM)Scale
- Infrastructure – Percentage with performance restrictions (fixed-guideway only)

Performance targets, and how those targets translate into project prioritization, is the focus of TAM plans. The Pennsylvania Group Plan is available on PennDOT's website at <https://www.penndot.gov/Doing-Business/Transit/InformationandReports/>. The group plan is updated annually with new targets as well as the current performance of the group.

All transit agencies are required to utilize Pennsylvania's transit Capital Planning Tool (CPT) as part of their capital planning process and integrate it into their TAM process. The CPT is an asset management and capital planning application that works as the central repository for all Pennsylvania transit asset and performance management activities.

Transit agencies update CPT data annually to provide a current picture of asset inventory and performance. From this data, PennDOT BPT updates performance targets for both the statewide inventory of Tier II agencies and for each individual agency in the plan based on two primary elements: the prior year's performance and anticipated/obligated funding levels. PennDOT BPT then reports this information to FTA and shares it with the MPOs/RPOs, along with investment information on priority capital projects anticipated for the following year. Agencies that are Tier I or non-participating Tier II use similar CPT data to set independent TAM performance targets and report these directly to the MPOs/RPOs.

Consistent with available resources and in coordination with the PennDOT BPT, transit agencies are responsible for submitting projects consistent with the CPT for the development of the transit portion of the Program. This will ensure that projects identified on the TIP are consistent with the TAM approach and respective TAM plans. PennDOT CPDM will update this project information in MPMS and share it with the MPOs/RPOs, PennDOT BPT, and the transit agencies.

Adams MPO – Safety Performance Measures (PM1)

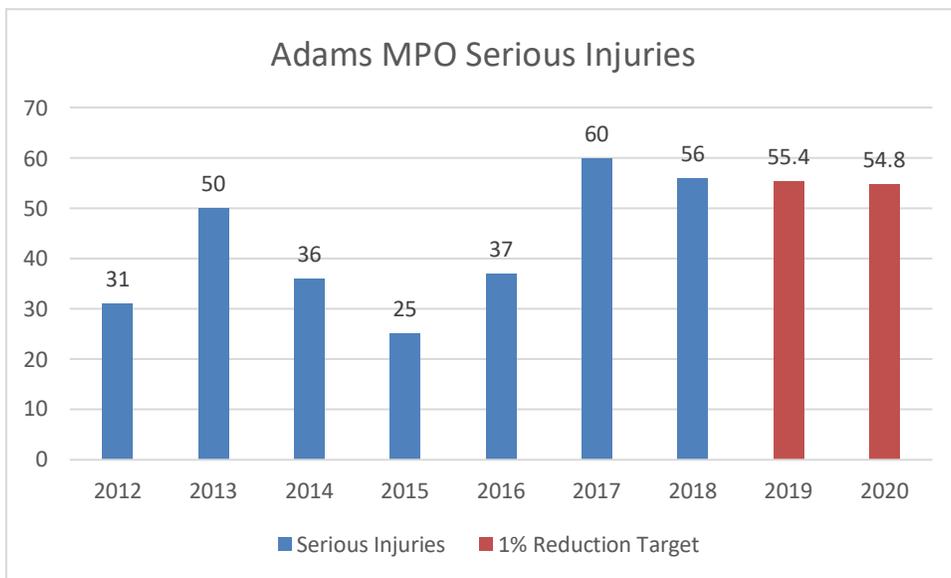
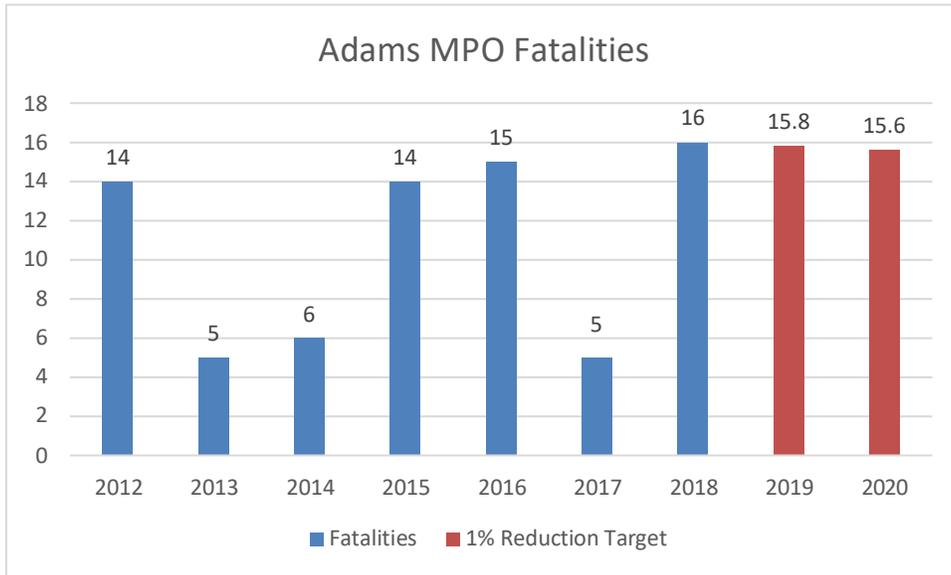
PM-1 BASELINES

Performance Measure	2012-2016 Baseline	2013-2017 Baseline	2014-2018 Baseline
Fatalities	12.8	9	11.2
Fatality Rate	1.433	1.008	1.253
Serious Injuries	34.0	41.6	42.8
Serious Injury Rate	3.805	4.659	4.787
Non-Motorized Fatalities/Serious Injuries	3.5	2.8	4

PM-1 TARGETS

Performance Measure	2014-2018 Target	2015-2019 Target	2016-2020 Target
Fatalities	10.8	8.7	13.5
Fatality Rate	1.218	0.956	1.492
Serious Injuries	35.8	47.7	52.6
Serious Injury Rate	4.044	5.242	5.812
Non-Motorized Fatalities/Serious Injuries	2.8	2.9	6.9

Adams MPO – Fatal and Serious Injury Crashes (2012 to 2018)



Adams MPO – Total Crashes by Year

2017

Crash Type	# of Crashes	% of Crashes
Fatal	5	0.50%
Injury	426	42.51%
Property Damage	571	56.99%
Total Crashes	1,002	

2018

Crash Type	# of Crashes	% of Crashes
Fatal	16	1.525%
Injury	430	40.87%
Property Damage	606	56.61%
Total Crashes	1052	

MAP-21 Bridge Performance by Business Plan Network (Based on all NHS Bridge Owners Greater than or Equal to 20' in Length)

MAP-21 Bridge Performance Measure												
Business Plan Network	Good				Fair				Poor			
	Count	Count %	Deck Area (Msf)	Deck Area %	Count	Count %	Deck Area (Msf)	Deck Area %	Count	Count %	Deck Area (Msf)	Deck Area %
Interstate	0	0.00%	0.000	0.00%	0	0.00%	0.000	0.00%	0	0.00%	0.000	0.00%
NHS, Non-Interstate	9	30.00%	0.047	32.73%	20	66.67%	0.092	64.06%	1	3.33%	0.005	3.21%
Total NHS	9	30.00%	0.047	32.73%	20	66.67%	0.092	64.06%	1	3.33%	0.005	3.21%

Total NHS Deck Area Poor %	Map-21 Goal	End of Year 2018 Value	2019 Target	2021 Target
	10.00%	3.21%	4.00%	5.50%

Business Plan Network	Count	Deck Area (Msf)
Interstate	0	0.000
NHS, Non-Interstate	30	0.143
Total NHS	30	0.143

- MAP-21 bridge data is assessed and analyzed by National Bridge Inventory Standards (Bridges 20' and greater), which differs from PennDOT's 8' and greater reporting.
- MAP-21 performance measures apply to all Interstate and NHS Non-Interstate bridges in PA, regardless of ownership. Therefore, PA Turnpike and local-owned bridges are included in totals.

- MAP-21 bridge performance measures required for FHWA reporting include good, fair, or poor condition scores for each bridge. A bridge is considered to be in good condition if the minimum condition rating of the deck, superstructure, substructure, or culvert ratings is 9, 8, or 7, fair if the minimum condition rating is 6 or 5, and poor if the minimum condition rating is 4 or less.
- FHWA requires that no more than 10 percent of a state's total NHS Bridge Deck Area be in poor condition. Additionally, state DOTs are required to establish biennial targets for poor deck area.
- FHWA has not established a minimum condition for Interstate only bridges or NHS non-Interstate bridges, but requires the state DOT to establish targets.
- FHWA requires that no more than 5 percent of a state's bridge data be unreported or missing.
- MAP-21 rulemaking requires that states develop and implement a risk-based asset management plan to achieve and sustain a state of good repair over the life cycle of the asset to improve or preserve the condition of the NHS. Asset Management encompasses two related means of doing so: making infrastructure last as long as reasonably possible through keeping up on preservation activities to minimize costlier major repairs, and utilizing a structure for its entire service life. These practices allow the department to operate to lowest life cycle cost (LLCC) on the network level.
- MAP-21 performance measures are not to explicitly drive planning and programming, but rather be an indication of performance achieved by states operating at the LLCC.

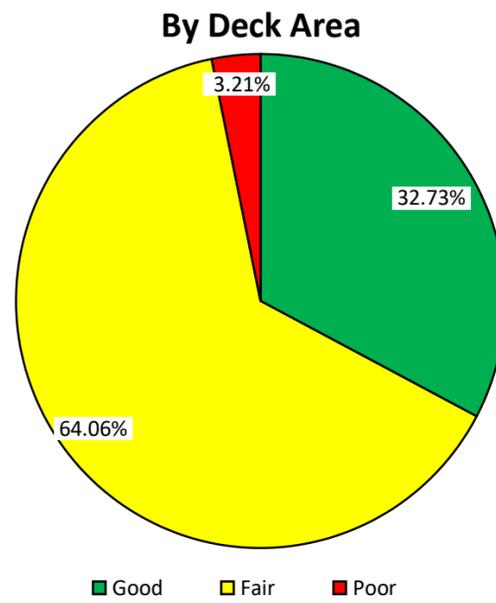
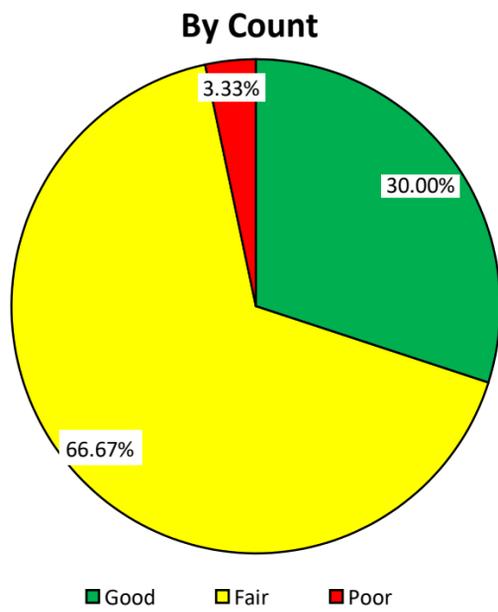
End of Calendar Year 2018 Status of Bridges (Based on 8' and greater)

Business Plan Network	Total Bridge Count	Total Deck Area (Msf)	Aver. Bridge DA (sf)	Closed Bridges	Posted Bridges	Poor Count	% Poor by Count	Poor-Deck Area (Msf)	% Poor by Deck Area	Non-Poor Bridges with a "5" Condition Rating
State >8'; Interstate/Ramps	0	0.0000	0	0	0	0	0.00%	0.0000	0.00%	0
State >8'; NHS (non-Interstate)	56	0.1628	2,907	0	0	1	1.79%	0.0046	2.82%	17
State >8'; non-NHS > 2000 ADT	124	0.2165	1,746	0	3	12	9.68%	0.0113	5.22%	41
State >8'; non-NHS < 2000 ADT	200	0.2571	1,286	0	3	26	13.00%	0.0333	12.93%	55
Total - State Bridges (>8')	380	0.6363	1,675	0	6	39	10.26%	0.0491	7.72%	113
Local >20'	67	0.0947	1,413	0	16	4	5.97%	0.0029	3.09%	27

Reducing Rate of Deterioration through Investment (Non-Replacement) (Based on 8' and greater)

Business Plan Network	Annual New Poor Count (Poor "on")	Annual New Poor Count (Poor "off")	Annual New Poor DA (Poor "on")	Annual New Poor DA (Poor "off")	Preservation (million\$)	Preservation (#bridges)
State >8'; Interstate/Ramps	0	0	0.00%	0.00%	\$0.00	0
State >8'; NHS (non-Interstate)	0	0	0.00%	0.00%	\$0.00	0
State >8'; non-NHS > 2000 ADT	0	4	0.00%	3.52%	\$1.68	3
State >8'; non-NHS < 2000 ADT	0	7	0.00%	4.38%	\$4.48	5
Total - State Bridges (>8')	0	11	0.00%	2.96%	\$6.16	8
Local >20'	0	0	0.00%	0.00%	\$0.00	0

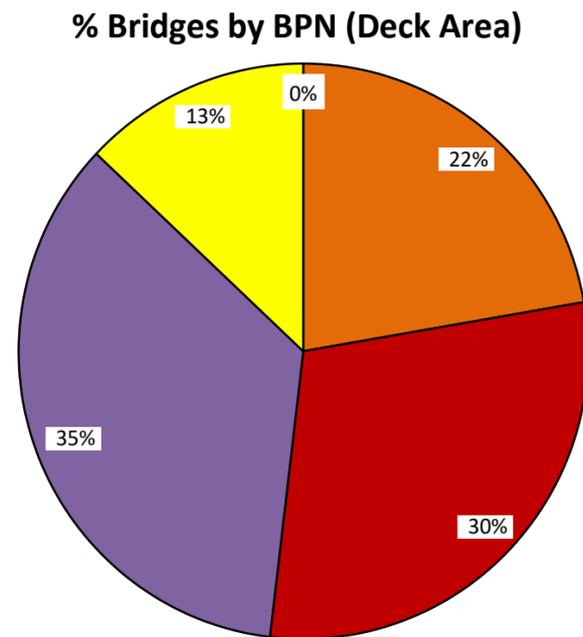
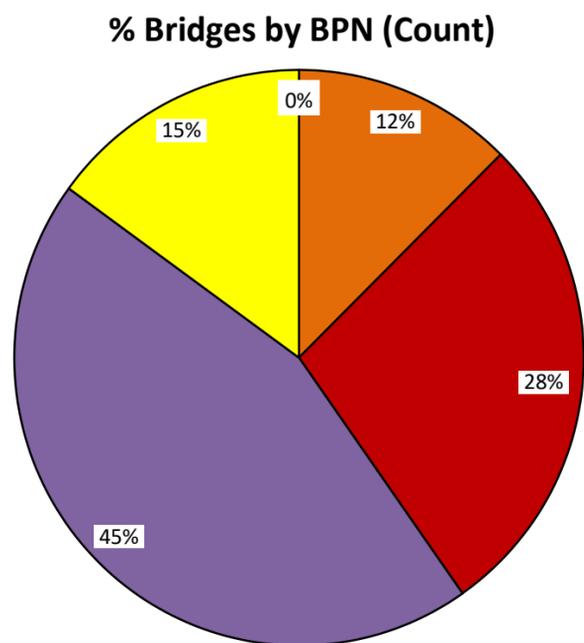
MAP-21 Bridge Performance (Based on all NHS Bridge Owners Greater than or Equal to 20' in Length)



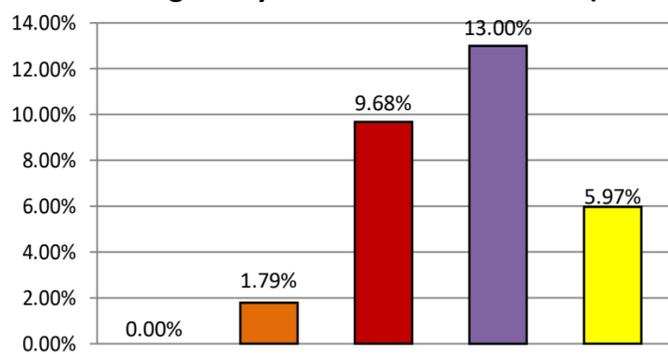
End of Calendar Year 2018 Status of Bridges in Region (Based on 8' and greater)

PennDOT Data 8' and Greater By Business Plan Network

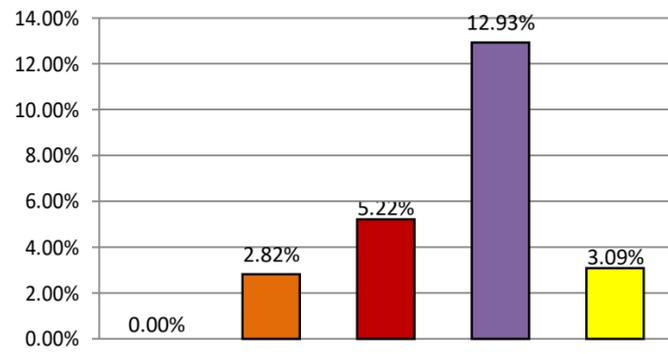
PennDOT Data 8' and Greater By Business Plan Network



Poor Bridge % by Business Plan Network (Count)



Poor Bridge % by Business Plan Network (Deck Area)



- State >8'; Interstate
- State >8'; NHS (non Interstate)
- State >8'; non-NHS >2000 ADT
- State >8'; non-NHS <2000 ADT
- Local >20'

- State >8'; Interstate
- State >8'; NHS (non Interstate)
- State >8'; non-NHS >2000 ADT
- State >8'; non-NHS <2000 ADT
- Local >20'

Current MAP-21 Pavement Performance by Business Plan Network (Based on Total PA Miles)

Business Plan Network	MAP-21 Pavement Performance Measure											
	Good				Fair		Poor				Missing (Max 5%)	
	Miles	%	2020 Target	2022 Target	Miles	%	Miles	%	2020 Target	2022 Target	Miles	%
Interstate	-	-	-	-	-	-	-	-	-	-	-	-
NHS, Non-Interstate	48.5	51.23%	46%	40%	45.9	48.49%	0.3	0.27%	2%	2%	1.4	1.44%

- MAP-21 pavement performance measures required for FHWA reporting include four distress components which translate to good, fair, or poor condition scores. See table on reverse of this page for distresses and thresholds. Three conditions apply to each pavement type. A pavement segment is considered in good condition if all three distress components are rated as good. A pavement segment is considered in poor condition if two or more of its three distress components are rated as poor.
- FHWA requires that no more than 5 percent of a state's NHS Interstate lane-miles be in poor condition. Additionally, state DOTs are required to establish targets.
- FHWA has not established a minimum condition for NHS non-Interstate roadways, but requires the state DOT to establish targets.
- FHWA requires that no more than 5 percent of a state's mileage be unreported or missing.
- Conditions are assessed and analyzed for pavement "sections" that cannot exceed 0.10 miles in length, which differs from PennDOT's historic segment level data.
- MAP-21 performance measures apply to all Interstate and NHS Non-Interstate miles in PA, regardless of ownership. Therefore, PA Turnpike and local-owned miles are in Statewide totals, but not in each District's totals. Local-owned miles are included in MPO/RPO totals as appropriate.
- MAP-21 rulemaking requires that states develop and implement a risk-based asset management plan to achieve and sustain a state of good repair over the life cycle of transportation assets and to improve or preserve the condition of the NHS. Asset Management encompasses two related means of doing so: making infrastructure last as long as reasonably possible, and keeping up on preservation activities to minimize costlier major repairs. Together, these practices extend the life of assets and reduce the cost of maintaining them in the desired state of good repair. This is known as operating the network at the lowest life-cycle cost (LLCC).
- MAP-21 performance measures are not to drive planning and programming, but rather be an indication of performance achieved by states operating at the LLCC.

Current Pavement Smoothness (IRI) Summary by Business Plan Network (Based on PennDOT Miles)

Business Plan Network	Excellent		Good		Fair		Poor		Median	Tested Seg-Mi
	Seg-Mi	%	Seg-Mi	%	Seg-Mi	%	Seg-Mi	%	IRI	
Interstate	-	-	-	-	-	-	-	-	-	0.0
NHS, Non-Interstate	48.8	50.45%	42.9	44.30%	3.2	3.25%	1.9	1.99%	73	96.8
Non-NHS, ≥ 2000 ADT	70.7	42.91%	62.2	37.78%	24.2	14.70%	7.6	4.61%	111	164.7
Non-NHS, < 2000 ADT	44.5	14.40%	111.9	36.18%	82.4	26.66%	70.4	22.76%	168	309.2
Total - Roadway	164.0	28.74%	217.0	38.02%	109.8	19.24%	79.9	14.00%	135	570.7

Current Overall Pavement Index (OPI) Summary by Business Plan Network (Based on PennDOT Miles)

Business Plan Network	Excellent		Good		Fair		Poor		Median
	Seg-Mi	%	Seg-Mi	%	Seg-Mi	%	Seg-Mi	%	OPI
Interstate	-	-	-	-	-	-	-	-	-
NHS, Non-Interstate	15.8	16.46%	76.3	79.71%	2.2	2.25%	1.5	1.58%	93
Non-NHS, ≥ 2000 ADT	52.7	32.10%	61.5	37.44%	49.0	29.83%	1.0	0.63%	87
Non-NHS, < 2000 ADT	93.3	30.13%	178.8	57.76%	35.8	11.55%	1.7	0.56%	82
Total - Roadway	161.7	28.40%	316.5	55.59%	86.9	15.26%	4.3	0.75%	84

Total Miles

PennDOT Seg-Mi	PA Miles
0.0	0.0
97.0	96.1
165.3	
309.9	
569.4	

- The IRI and OPI data presented herein is segment level.
- For the Interstate and NHS, Non-Interstate Business Plan Networks, the IRI and OPI data is for 2018. For the Non-NHS Business Plan Networks, the IRI and OPI data for most recent year captured, either 2017 or 2018.
- PennDOT has historically classified Good Interstate IRI as ≤100, and Poor Interstate IRI as >150; for NHS Non-Interstate, Good is ≤120 and Poor is >170. This practice is maintained in the IRI data presented herein, but differs from the MAP-21 definitions defined in the table on the reverse of this page.

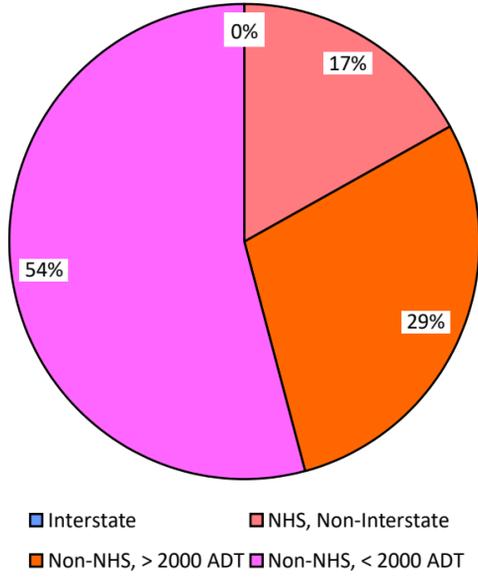
Current Out-Of-Cycle (OOC) Assessment by Business Plan Network (Based on PennDOT Miles)

Business Plan Network	High Level Bituminous		Low Level Bituminous				Concrete				Potentially Past DSL
	Seg-Mi	OOC Mi ¹	Seg-Mi	OOC Mi ²	OOC Mi ³	Total	Seg-Mi	OOC Mi ⁴	OOC Mi ⁵	Total	Seg-Mi
Interstate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NHS, Non-Interstate	86.1	18.2	0.0	0.0	0.0	0.0	15.6	0.6	15.3	0.6	19.5
Non-NHS, ≥ 2000 ADT	158.0	64.8	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Non-NHS, < 2000 ADT	66.5	18.7	243.2	39.0	119.4	39.0	0.0	0.0	0.0	0.0	
Total - Roadway	310.7	101.7	250.4	39.0	119.4	39.0	15.6	0.6	15.3	15.3	

- Out-Of-Cycle Categories:
 - High Level Bituminous Pavement with Age > 12 Years or > 17 Years with Interim Surface Seal
 - Low Level Bituminous Surface with Age > 7 Years
 - Low Level Bituminous Pavement with Age > 20 Years or no Structural Layers
 - Concrete Pavements with Age > 30 Years
 - Concrete Pavements with Age > 20 Years and No Concrete Pavement Restoration (CPR)
- Total Low Level OOC represents the miles that are OOC for either Category 2 or 3. Segments that are OOC for both categories are not double counted. Total Concrete OOC represents the miles that are OOC for either Category 4 or 5. Segments that are OOC for both categories are not double counted.
- Pavement Potentially Past Design Service Life is defined a pavement structure age greater than 40 years, and OOC according to any of the categories. This indicates that, even though the surface is OOC, the pavement may be in need of more than resurfacing or CPR due to it's overall age.
- The IRI miles and Total PennDOT miles include bridge lengths. The Total PA miles, used for MAP-21, do not include bridge lengths.

The Treatment Network miles do not include bridge lengths.

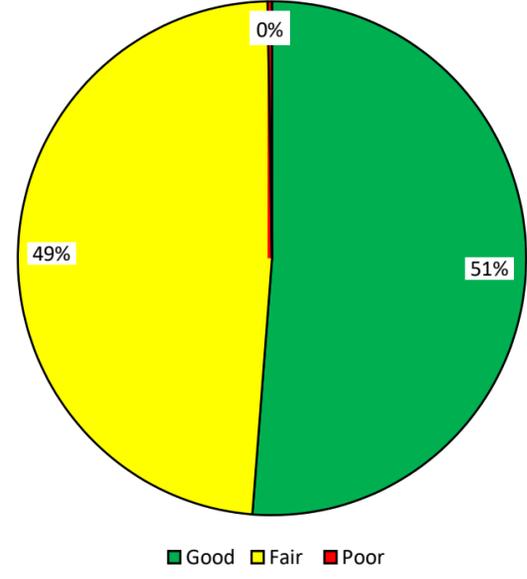
Percent Total PennDOT Segment Miles by Business Plan Network



MAP-21 Interstate Performance All PA Miles



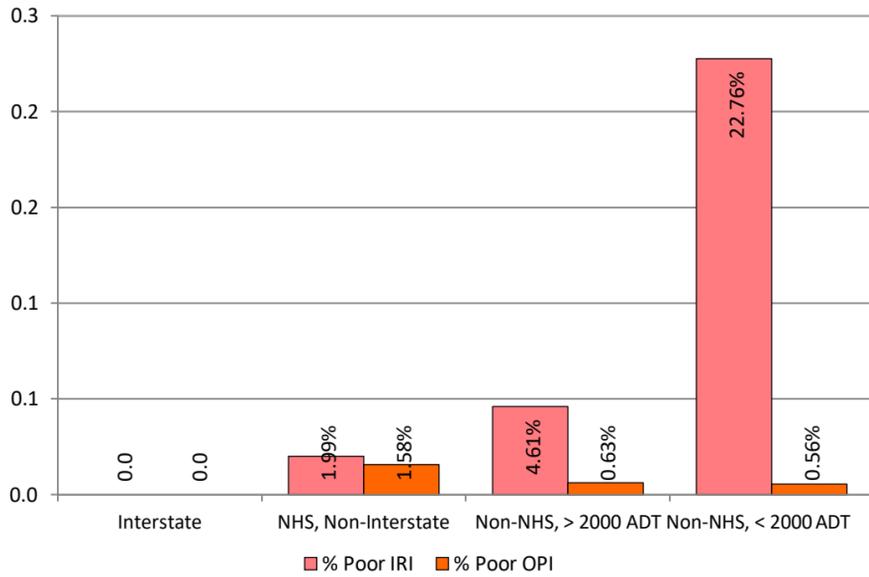
MAP-21 NHS Non-Interstate Performance All PA Miles



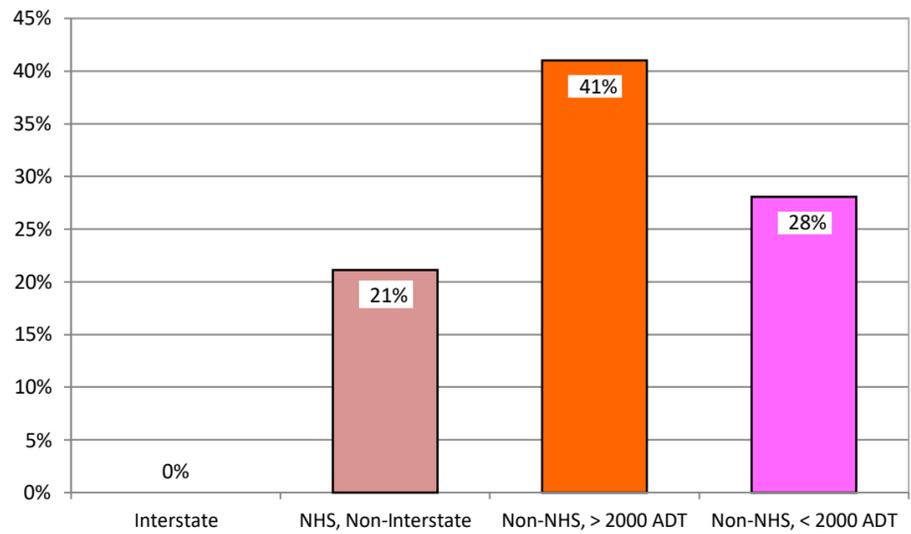
MAP-21 Pavement Conditions and Thresholds

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

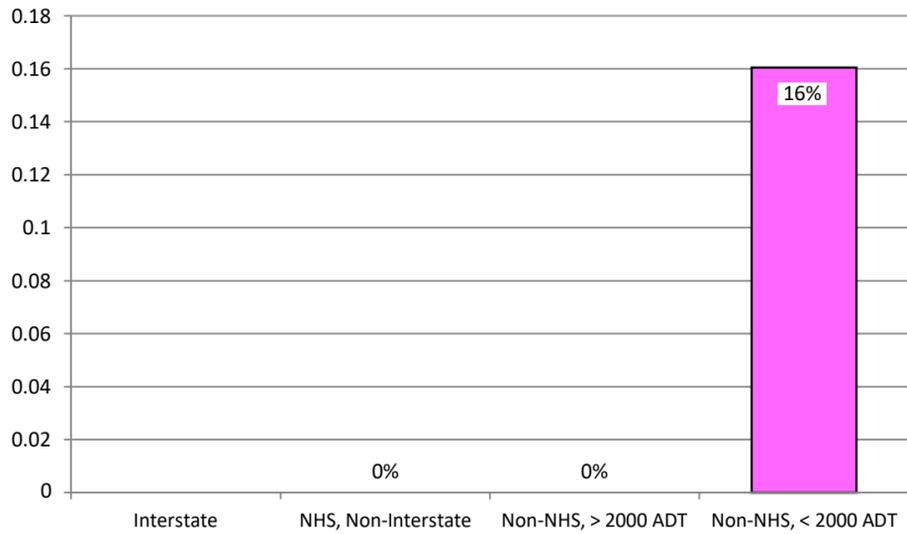
Percent of Poor IRI and Poor OPI by Business Plan Network



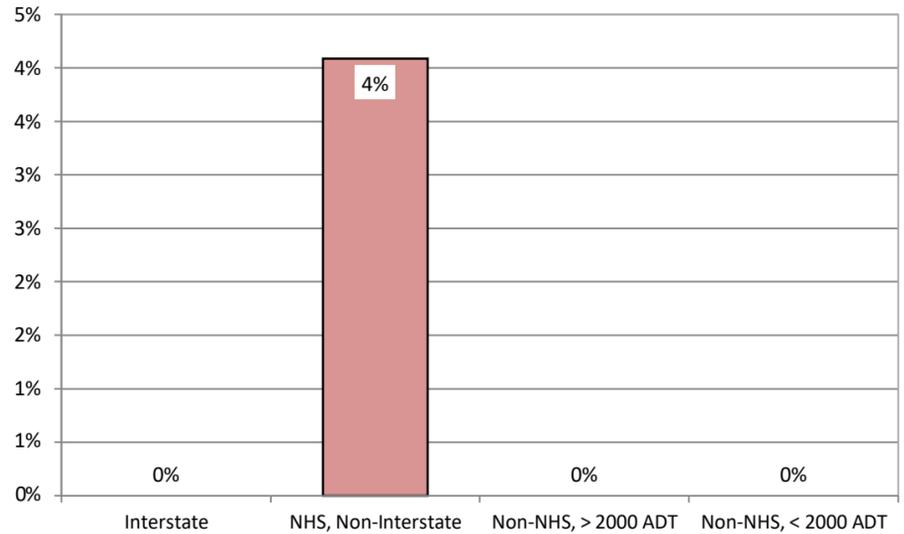
Percent of High Level Bituminous Miles Out-Of-Cycle by Business Plan Network



Percent of Low Level Bituminous Miles Out-Of-Cycle by Business Plan Network



Percent of Concrete Miles Out-Of-Cycle by Business Plan Network





COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
HARRISBURG, PENNSYLVANIA

OFFICE OF
SECRETARY OF TRANSPORTATION

July 16, 2018

Dear Planning Partners:

The Moving Ahead for Progress in the 21st Century Act (MAP-21) and Fixing America's Surface Transportation (FAST) Act established a series of performance measures to ensure effective use of Federal transportation funds. Title 23 Part 490 of the Code of Federal Regulations (23 CFR 490) establishes measures to assess pavements on the National Highway System (NHS), bridges carrying the NHS, and pavements on the Interstate, which are collectively referred to as the PM-2 measures. 23 CFR 490.105 establishes measures to assess the performance of the NHS, freight movement on the Interstate, and the Congestion Mitigation and Air Quality Improvement (CMAQ) Program. These measures are collectively referred to as the PM-3 measures.

PM-2 Performance Measures include:

- 1) Percentage of pavements on the Interstate System in Good condition
- 2) Percentage of pavements on the Interstate System in Poor condition
- 3) Percentage of pavements on the NHS (excluding the Interstate System) in Good condition
- 4) Percentage of pavements on the NHS (excluding the Interstate System) in Poor condition
- 5) Percentage of NHS bridge deck area classified as in Good condition
- 6) Percentage of NHS bridge deck area classified as in Poor condition

PM-3 Performance Measures include:

- 1) Percent of Person-miles Traveled on the Interstate System that are Reliable
- 2) Percent of Person-miles Traveled on the Non-Interstate NHS that are Reliable
- 3) Interstate System Truck Travel Time Reliability Index
- 4) Annual Hours of Peak-Hour Excessive Delay (PHED) per Capita
- 5) Percent Non-Single Occupant Vehicle (SOV) Travel
- 6) On-Road Mobile Source Emissions Reduction for CMAQ-funded Projects

For the three reliability measures, PennDOT has set statewide targets (sub-state targets are optional). Metropolitan Planning Organizations (MPOs) baseline reliability measures have been provided for informative purposes only. For the first performance period, the annual hours of excessive delay and non-SOV travel measures must be developed for the Pittsburgh and Philadelphia urbanized areas only. PennDOT has worked closely with the Southwestern Pennsylvania Commission (SPC) and the Delaware Valley Regional Planning Commission (DVRPC) to develop these targets and to include the necessary multi-state coordination partners in the target-setting process.

The mobile source emissions measure targets are produced statewide and for each MPO that is in nonattainment or maintenance of the National Ambient Air Quality Standards.

Federal regulations require MPOs to establish targets for each performance measure, within 180 days of PennDOT establishing targets (by November 16, 2018) either by agreeing to plan and program projects in support of PennDOT targets, or by committing to their own quantifiable targets. PennDOT is requesting that Rural Planning Organizations (RPOs) also establish targets by November 16, 2018, by agreeing to support the PennDOT targets or setting their own. The Federal Highway Administration (FHWA) will determine annually whether PennDOT has met, or has made significant progress toward meeting established statewide targets. More information on Transportation Performance Management (TPM) is available at <https://www.fhwa.dot.gov/tpm/faq.cfm>.

To ensure compliance with 23 U.S.C. §134, please respond to this letter by selecting an option for PM-2 and PM-3 measures below before November 16, 2018.

Please select one of the following options for PM-2 measures:

The MPO/RPO decision-making body agrees to support the state PM-2 targets by planning and programming projects that contribute to meeting or making significant progress toward the established PennDOT performance targets. See Attachment 1 and 2 of the enclosures for statewide baseline and target values.

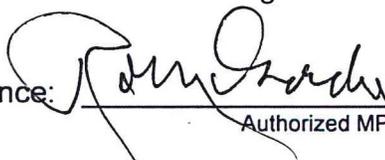
The MPO/RPO decision-making body commits to establishing their own quantifiable targets and has attached their methodology. MPOs/RPOs that establish their own targets will report the methodology used to develop them.

Please select one of the following options for PM-3 measures:

The MPO/RPO decision-making body agrees to support the state PM-3 targets by planning and programming projects that contribute to meeting or making significant progress toward the established PennDOT performance targets. See Attachment 3, 4, 5, and 6 of the enclosures for statewide baseline and target values.

The MPO/RPO decision-making body commits to establishing their own quantifiable targets and has attached their methodology. MPOs/RPOs that establish their own targets will report the methodology used to develop them.

Concurrence:



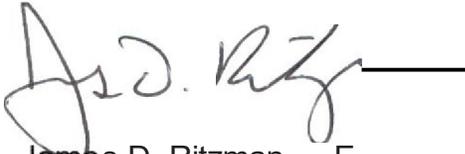
Authorized MPO/RPO Spokesperson

Date: *DJ* It.;;r&I 9

SUBMIT

Should you have any questions, please contact Kristin Mulkerin , Transportation Planning Manager, at 717.783.2430 or via email at kmulkerin@pa.gov.

Sincerely,



James D. Ritzman, P.E.
Deputy Secretary for Planning

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George W. McAuley, Jr., P.E.
Deputy Secretary for Highway Administration

Enclosure

Attachment 1: PM-2 Baseline and Target Values for Pavement Measures

Interstate:

Measure	2017 Baseline	2019 2-year Target	2021 4-year Target
Percentage in Good Condition	67.2%	<i>N/A</i>	60.0%
Percentage in Poor Condition	0.4%	<i>N/A</i>	2.0%

NHS Non-Interstate:

Measure	2017 Baseline	2019 2-year Target	2021 4-year Target
Percentage in Good Condition	36.8%	35.0%	33.0%
Percentage in Poor Condition	2.3%	4.0%	5.0%

Definitions:

Pavement performance measures required for FHWA reporting include 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 percent, rutting, and faulting:

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 pav ements, 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 490.31S(a) , Subpart C, requires t hat no more than 5 percent of a state's NHS Interstate lane-miles be in poor pavement condition .

- PennDOT's pavement condition target (its desired state of good repair) for NHS Interstate roadways mirrors 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 LLCC, and achieving national and state transportation goals.
- 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 that reported section does not provide sufficient data to determine its Overall Condition .

Methodology:

- Since no historical data at tenth -mile increments exists, previously collected segment-level data for the years 2013-2016 was quantified and used to determine deterioration rates for each condition . For each segment, the change of each condition value was determined from 2013 to 2014, from 2014 to 2015, and from 2015 to 2016.
- If a value was missing for any year, no change was calculated . If a condition value equaled zero for any year, it was excluded based on the assumption that a significant repair (i.e., a project) had been completed. The change in condition for each year was averaged for each segment; the segment averages were then averaged to determine an overall deterioration rate for each condition .
- There are instances where there was incremental improvement from one year to the next for the conditions. This is attributed to minor maintenance and/or bias in the collection process. These values were included in the analysis . The overall deterioration rate was then increased by 3 percent to reflect the impact of inflation . Since minor maintenance is reflected in the deterioration rate, and our ability to continue to perform those activities is affected by inflation, as a worst case, the deterioration would increase proportionately to the decrease in spending power for this work.
- Where the segment average resulted in a negative number (i.e., the condition value improved over the three-year period), a value of zero was used for the segment average since deterioration was not reflected in that segment average value.
- The resultant deterioration rates are provided in the following table:

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. These values reflect a state of "do nothing."
- Based on data from MPMS, all projects programmed on the Interstate and NHS non-Interstate networks for the next four years (2018-2021) were compiled. The mileage of these programmed projects that affected pavements in good, fair, and poor condition was determined, and these proportions were projected over the next four-year period (2022-2025) and the following four-year period (2026-2029). Since the TYP is not fully developed beyond the first four years, projecting programmed mileage for the first four years is 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.

Attachment 2: PM-2 Baseline and Target Values for Bridge Measures

Measure	2017 Baseline	2019 2-year Target	2021 4-year Target
Percentage in Good Condition	25.6%	25.8%	26.0%
Percentage in Poor Condition	5.5%	5.6%	6.0%

Definitions:

Separate bridge structure condition ratings are collected for deck, superstructure, and substructure components during regular inspections using the National Bridge Inventory 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 FHWA scoring system for bridge condition metrics for deck, superstructure, substructure, and culvert components is summarized in the following table:

Rating	Good	Fair	Poor
Deck	7-9	5 or 6	3-4
Superstructure	7-9	5 or 6	3-4
Substructure	7-9	5 or 6	S4
Culvert	7-9	5 or 6	S4

- 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.
- 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.

Methodology:

- 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.

Attachment 3: PM-3 Baseline and Target Values for Reliability and Peak Hour Delay Measures

(Baseline Estimated using RIT/5 Data Extract from May 8, 2018)

Measure	2017 Baseline	<i>2019</i> 2-year Target	<i>2021</i> 4-year Target
Interstate Reliability (Statewide)	89.8%	89.8%	89.8%
Non-Interstate Reliability (Statewide)	87.4%	<i>N/A</i>	87.4%
Truck Reliability Index (Statewide)	1.34	1.34	1.34
Annual Peak Hour Excessive Delay Hours Per Capita (Urbanized Area)	<i>DVRPC</i> 16.8	<i>N/A</i>	17.2
	<i>SPC</i> 11.1	<i>N/A</i>	11.8

Attachment 4: PM-3 Baseline and Target Values for Non-SOV Travel Measure

(Baseline Estimated using American Community Survey)

Measure	2017 Baseline	<i>2019</i> 2-year Target	<i>2021</i> 4-year Target
Percent Non-Single Occupant Vehicle Travel (Urbanized Area)	<i>DVRPC</i> 27.9%	28.0%	28.1%
	<i>SPC</i> 24.8%	24.6%	24.4%

Attachment 5: PM-3 Baseline and Target Values for CMAQ Emission Measures

Applicable MPOs and Pollutants Determined from:

<https://www.fhwa.dot.gov/11/en11/ironment/airquality/cmaq/measures/cmaqapplicability/page03.cfm#oc494364458>

Measure	MPO	Emissions (kg/day)	
		2019 2-year Target*	2021 4-year Target
VOE Emissions	Statewide	109.460	201.730
	DVRPC (PA only)	37.610	69.310
	SPC	58.060	107.000
	Lehigh Valley	11.690	21.540
	Lancaster	1.950	3.600
	Reading	0.150	0.270
	NEPA	0.000	0.000
NOx Emissions	Statewide	337.700	612.820
	DVRPC (PA only)	23.420	42.500
	SPC	256.110	464.770
	Lehigh Valley	57.550	104.440
	Lancaster	0.570	1.030
	Reading	0.040	0.080
	NEPA	0.000	0.000
PM _{2.5} Emissions	Statewide	10.760	20.490
	DVRPC (PA only)	1.080	2.060
	SPC	7.010	13.350
	Lehigh Valley	2.320	4.410
	York	0.060	0.110
	Harrisburg	0.050	0.100
	Lancaster	0.020	0.040
	Lebanon	0.050	0.090
	Johnstown	0.170	0.320
PM ₁₀ Emissions	Statewide	9.540	17.470
	SPC	9.540	17.470
CO Emissions	Statewide	567.700	1135.400
	DVRPC (PA only) **	282.740	565.470
	SPC	284.970	569.930

* 2-year emission targets are only applicable for SPC, DVRPC and Statewide targets (bold above). MPOs with populations <1 million are not required to report 2-year emission targets. The values were used to establish statewide 2-year targets.

** As of December 2017, DVRPC's CO 2nd 10-year maintenance plan has ended. The applicability determination is made based on NAAQS designations as of one-year before the State DDT Baseline Performance Period Report is due. PennDOT and DVRPC will request that CD targets be excluded from the requirements at the midpoint of the performance period.

PM 3 Target Setting Notes:

Reliability Measures:

- Targets set equivalent to 2017 baseline values
- Limited historic data to understand trends of reliability measures.
- More research and data monitoring required to identify trends and project impacts on measure.
- Reassessment at mid-term period .

Delay Measure:

- Historical Vehicle Miles Travel (VMT) and INRIX GPS data suggest increasing delay trends.
- MPO travel models in each region indicate potential increases to VMT and delay.
- Combination of MPO staff input, travel model forecasts, VMT and vehicle registration trends, and forecast economy information used to establish higher delay targets at this time.
- DVRPC estimates 0.6% annual increase in delay/capita .
- SPC estimates 1.5% annual increase in delay/ capita.
- Reassessment at mid-term period.

Non-SOV Travel Measure:

- Non-SOV Travel trends based on ACS survey data are relatively constant over the last 5 years.
- DVRPC trend indicates slightly increasing Non-SOV percentage.
- SPC trend indicates slightly decreasing Non-SOV percentage.
- Reassessment at midterm .

Emission Measures:

- Targets based on reported emissions in FHWA's CMAQ annual database.
- Targets are very difficult to anticipate as CMAQ-funded projects can produce a wide range of benefits.
- 4-year (2014-2017) historical benefits for new CMAQ projects averaged to support target setting.
- Many projects are expected to provide less emissions benefit in the future due to fleet turnover.
- Historical average CMAQ benefits by MPO adjusted to reflect cleaner fleet in future years.

Attachment 6: Supplemental Information for MPO Distribution
PM-3 Baseline Reliability Measure Values by MPO
(Extracted from RIT/5 on May 8, 2018)

MPO*	2017 Baseline Travel Time Values		
	Interstate Reliability	Non-Interstate Reliability	Truck Reliability
Statewide	89.8%	87.4%	1.34
Adams	N/A	87.9%	N/A
Altoona	100.0%	83.5%	1.20
Johnstown	N/A	95.1%	N/A
Centre	100.0%	92.6%	1.14
DVRPC**	74.4%	84.1%	1.83
Erie	100.0%	83.9%	1.25
Franklin	100.0%	94.0%	1.09
Harrisburg	90.9%	91.9%	1.37
Scranton - Wilkes-Barre	98.1%	87.5%	1.40
Lancaster	100.0%	94.1%	1.08
Lebanon	100.0%	93.0%	1.11
Lehigh Valley	100.0%	87.1%	1.34
NEPA	100.0%	92.1%	1.22
Reading	100.0%	93.4%	1.12
Shenango Valley	99.4%	94.9%	1.18
SPC	92.3%	87.0%	1.44
SEDA-COG	100.0%	95.5%	1.10
WilliamSPORT	100.0%	98.3%	1.16
York	100.0%	89.5%	1.22

- The RIT/5 analysis platform currently does not directly produce MAP-21 measures for RPO areas
- DVRPC MPO values currently include areas outside of Pennsylvania that are within MPO boundaries

TRANSIT PERFORMANCE MEASURES

CENTRAL PENNSYLVANIA TRANSPORTATION AUTHORITY

FFY 2021-2024 TRANSIT TIP UPDATE

TRANSIT PERFORMANCE MEASURES DOCUMENTATION

April 2020

BACKGROUND

The final rule on metropolitan and statewide planning, published in the Federal Register on May 27, 2016, addressed changes to the metropolitan planning process stemming from the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America's Surface Transportation Act (FAST) and discussed Performance Based Planning and Programming (PBPP).

As part of the implementation of the PBPP requirements, States, MPOs, and providers of public transportation must jointly agree upon and develop specific written provisions for cooperatively developing and sharing information related to transportation performance data, the selection of performance targets, and the reporting of performance targets, with the reporting of performance to be used in tracking progress toward attainment of critical outcomes for the MPO region.

The Central Pennsylvania Transportation Authority (CPTA) Transit Asset Management Plan (TAMP) State of Good Repair (SGR) and TAM Policy statements were adopted by the CPTA Board in September 2018. Further, the CPTA Board, in the capacity as the York Area Metropolitan Planning Organization (YAMPO) Transit Committee, requested adoption of the plan and underlying performance targets by the YAMPO Coordinating Committee. A motion to approve CPTA's TAM Plan and associated Performance Targets was motioned and carried by the YAMPO Coordinating Committee in December of 2018. The TAMP identified the required elements of a Tier I TAMP, as required of CPTA per the one hundred and one (101) or more vehicles in revenue service during peak regular service across any one non-fixed route mode threshold. Elements included an outlined the performance measures, targets, and implementation strategies CPTA will use to maintain its transit system assets. Specific reference to these nine (9) required elements in 49 CFR 625 and as outlined in the TAMP itself.

The goal of the TAMP is for CPTA to reach and maintain a state of good repair for all of its capital assets through the Performance Based Planning and Programming process. Annually, a Performance Goal is to be developed or reviewed and confirmed for agency appropriate asset category that the FTA has identified in its implementing guidelines. In the case of CPTA, these include vehicles, facilities, and equipment. While CPTA is aware of infrastructure as a defined category, it does not own or maintain any qualify assets and thus excludes it from the TAMP. The expectation is that by achieving the annual Performance Goals CPTA will reach and maintain a state of good repair for the asset category identified.

PERFORMANCE GOALS

FY 2019 was the first year Performance Goals were required to be established and coordinated between CPTA and YAMPO. CPTA's Performance Goals are authority-wide and reflect consideration of facilities, vehicles and equipment supporting its ten counties of operation. These ten counties include Adams, Columbia, Cumberland, Franklin, Montour, Northumberland, Perry, Snyder, Union and York Counties.

To reiterate, The TAMP and included performance targets were approved by the CPTA Board in September 2018 and YAMPO in December 2018. CPTA employs a performance measure target based on a percentage threshold. While the objective of the CPTA is to assign performance measurement targets of zero across all categories, it is in the nature of limited resources to defer replacement of assets based on strategic planning and historic life of like assets. This threshold is therefore adjusted and defined with asset category specific elements in mind. The below table identifies the target percentage as it is currently defined. These performance targets have been maintained since the implementation of the TAMP as no substantive changes were identified since inception.

Asset Category	Performance Measure	Target Percent
Rolling Stock	Age - % of revenue vehicles within a particular asset class that have met or exceeded their Useful Life Benchmark (ULB)	10%
Equipment	Age - % of vehicles that have met or exceeded their Useful Life Benchmark (ULB)	25%
Facilities	Condition - % of facilities with a condition rating below 3.0 on a the FTA Transit Economic Requirements Model (TERM) Scale	0%

FACILITIES

CPTA owns and operates seven (7) facilities, which are spread out and based across the ten county system. Included in this county of facilities is two (2) park and rides, two (2) passenger stations, and three (3) administrative and maintenance facilities. County based offices and leases are included in the state plans and are thus excluded from CPTA's current facility listing. Regular inspections of the facilities and their operating systems are performed consistent with the agency's facility maintenance plan. Further, an overall condition assessment is performed on an annual basis using Transit Economic Requirements Model (TERM) measurements by a senior staff within the Operations or Maintenance department. This annual inspection includes a visual inspection rating of various components and subcomponents in which the total score is averaged to generate a final condition assessment on a one (worse) to five (best) scale consistent with TERM guidance.

Reference to the scale and criteria utilized in the facility inspections is provided below:

FTA TERM Rating Scale		
Rank	Category	Description
5.00	New/Excellent	New asset; no visible defects.
4.00	Good	Some slightly defective/deteriorated component(s).
3.00	Adequate	Some moderately defective/deteriorated component(s).
2.00	Marginal	Increasing # of defective/deteriorated component(s) & maintenance needs.
1.00	Poor	In need of immediate repair or replacement; Item is a safety hazard, and may have critically damaged component(s).

CPTA's current facilities are in good to excellent condition across the board with all facilities achieving a score

of three (3) or higher. This means that CPTA currently maintains a 0% performance in terms of facilities beyond Useful Life Benchmark (ULB) consistent with target. CPTA does anticipate renovations to the York Transfer Center in the next few years, but these renovations are primarily associated to safety and security enhancements rather than deterioration of facility below condition threshold.

The Performance percentage of 0% exceeding ULB remaining unchanged reflects the investment that has occurred to date has been adequate and planned investments will only serve to maintain these facilities in a high state of good repair.

Further improvements are not currently identified in the TIP update period.

VEHICLES

In accordance with the agency TAMP, CPTA utilizes an aspirational target for rolling stock. This means that while the agency has a desired target of 10%, the agency is aware that real percentage of vehicles beyond ULB exceeds that threshold. The agency decision to utilize an aspirational target was originally because the agency was in a transitional period where the majority of its diesel fuel rolling stock is being retired and replaced with compressed natural gas (CNG) fuel type. While that process is concluding early in 2020, the past few years have been a period of expansion of service, and CPTA anticipates some minor delays in replacement of demand response vehicles such as cutaway, vans, and minivans due to delays in some active procurement awards. This will result in a general balance of the status quo and thus why CPTA did not make substantive revision to the targets.

CPTA assesses the performance of vehicles differently from how facilities are assessed, as identified in the table in Performance Goals. Instead, the agency utilizes the default ULB, as provided by the FTA, to assess each assets performance and then identifies a percentage of assets that exceed that target. This is not to be confused with the grant agreement capital asset guidance of the Estimated Service Life (ESL) utilized for state-funded or the Estimated Useful Life (EUL) for federally funded assets. Instead, ULB identifies when the vehicle is no longer viewed as in a state of good repair. These ULBs are classified by vehicle type. CPTA identifies two-hundred and ninety-two (292) vehicle assets across the following asset classes: over-the-road bus, bus, cutaway, minivan, and van.

Since November 2019, CPTA has received, and replaced several of their heavy-duty diesel buses with heavy-duty CNG buses. While this results in a decline in the asset class "bus" percentage exceeding ULB target from 37% to approximately 3%, this fleet is proportionately smaller than the demand response assets in the cutaway, minivan, and van grouping. As noted, the delays in replacement of several of these assets associated to delays in joint shared ride vehicle procurement will result in a balancing of the ULB overall percentage that this heavy-duty replacement otherwise would have improved. However, this is viewed as short-term and CPTA anticipates the joint shared ride vehicle procurement to have available options to replace those held vehicle by the middle to end of 2020.

In general, CPTA strives to maintain consistency with the TAMP in that the agency will begin programming the replacement of assets within a year of their ESL or EUL with the expectation of replacing them within the period they have exceeded their ESL and EUL requirements, but still fall within the state of good repair.

EQUIPMENT

All CPTA identified equipment that is identified in this list is a service vehicle or a capital equipment that has an acquisition value of \$50,000 or more. At this time, CPTA only identifies service vehicles in this list. However, it is important to note there is a lot of other equipment being used and maintained by CPTA that is below that \$50,000 threshold. CPTA evaluates such equipment and maintains their records, inclusive of the

condition rating, in the PennDOT Capital Planning Tool (CPT).

In accordance with the agency TAMP, CPTA utilizes an aspirational target of 25% for equipment. This is largely because the ULB for Automobile and Trucks and other Rubber Tire Vehicles default ULBs of eight (8) for Automobiles and fourteen (14) for trucks and other rubber tire vehicles. As CPTA does not desire to adjust default ULB during the first few years of the plan implementation it recognizes that support vehicles have historically been held for at least ten (10) years based on PennDOT Estimated Service Life (ESL) requirements. This would result in this class of vehicles being held at least two years beyond the default ULB in standard capital planning.

CONCLUSION

The implementation of the proposed projects included in the FFY 2021-2024 are expected to assure CPTA achieves its goal of maintaining its facilities, vehicles and equipment in a state-of-good-repair and to work towards achievement of or exceeding of performance targets. CPTA will prepare, maintain and coordinate as per the requirements of the TAM guidance and the agency's TAMP Evaluation Plan section.