

## Appendix 3: Transportation Performance Management

National performance measures and goals ([23 CFR 490](#)) have been established by federal legislation (MAP-21 and FAST Act) for the federal-aid highway program to assess the following: the condition of pavements and bridges on the National Highway System (NHS); safety in terms of serious injuries and fatalities on public roads; performance of the Interstate and non-Interstate NHS; freight movement on the Interstate system; traffic congestion and on-road mobile source emissions as related to the CMAQ Program; NHS asset management; and, public transit asset management through state of good repair (SGR) measures. Data is being gathered and shared among MPO and RPO planning partners to develop baseline measurements and prepare for the ongoing assessment of progress toward performance targets. Processes are being developed by PennDOT for publishing standardized reports to disseminate this information to planning partners and the public.

### Metropolitan Planning Final Rule

The FHWA final rule for Statewide and Nonmetropolitan Transportation Planning; Metropolitan Transportation Planning was published in the Federal Register ([81 FR 34050](#)) on May 27, 2016 and became effective on June 27, 2016.

The final rule establishes that the statewide and metropolitan transportation planning processes must provide for the use of a performance based approach to decision making in support of the national goals described in [23 U.S.C. 150\(b\)](#) and the general purposes described in [49 U.S.C. 5301](#). The final rule requires that states, MPOs, and operators of public transportation establish targets in key national performance areas to document expectations for future performance and that states, MPOs, and operators of public transportation must coordinate the targets that they set for key areas.

It further establishes that MPOs must reflect those targets in their Long-Range Transportation Plans and that states must reflect those targets in their Long-Range Statewide Transportation Plans. The final rule establishes that the states and MPOs must each describe the anticipated effect of their respective Transportation Improvement Programs (TIP/STIP) toward achieving their targets. MAP-21 contained new performance-related provisions requiring states, MPOs, and operators of public transportation to develop other performance-based plans and processes, which support the seven National Performance Goals. The final rule establishes that states and MPOs must integrate the goals, objectives, performance measures, as well as targets of other performance based plans and processes into their overall performance based planning process.

To support the effective implementation of a performance-based planning process, the final rule establishes that every MPO serving an area designated as a transportation management

area (TMA) must include on its policy board an official (or officials) who is formally designated to represent the collective interests of the operators of public transportation in the metropolitan planning area (MPA) and will have equal decision making rights and authorities as other officials on its policy board. The Port Authority of Allegheny County and the Chair Person of the SPC Transit Operators Committee are represented on the Southwestern Pennsylvania Commission.

As discussed in previous sections, states, MPOs and transit providers must establish performance targets to address USDOT established performance measures. States must establish targets within one year of final rule implementation and no later than 180 days after the state adopts target(s); MPOs either adopt the respective state target(s) or establish their own target(s). These targets must be coordinated with relevant state and public transportation providers to ensure consistency. The State, MPO and transit providers must cooperatively develop provisions for the development and sharing of performance data, selection and reporting of targets, and data collection for the state asset management system for the NHS. The documentation of a data development, sharing and PM reporting mechanism can be implemented as a part of the MPO planning agreement or in some other mutually agreed upon and documented means.

States and MPOs may also adopt locally defined performance measures and targets to complement those required by the U.S. DOT. The federal PBPP targets must be integrated with other performance based planning efforts undertaken, such as the MPO Congestion Management Process.

### **Metropolitan Long-Range Transportation Plan**

Once the MPO sets its respective performance targets, those targets along with a description of the measures and accompanying performance reports that discuss progress achieved in meeting the targets must be included in the MPO Long-Range Transportation Plan (LRTP). Other elements include a description of the planning process used to integrate other MPO performance based plans and documentation of the agreement and coordination between the MPO, state and public transportation providers on performance data collection, target setting and reporting. Metropolitan Long-Range Transportation Plans adopted after May 20, 2019 must comply with the Final Planning Rule. The performance based elements of the LRTP include:

### **Transportation Improvement Program**

The Transportation Improvement Program (TIP) must demonstrate consistency with the Long-Range Transportation Plan as well as other performance management plans such as: state and transit asset management plans, the Strategic Highway Safety Plan (and Regional Safety Action Plan), the MPO CMAQ performance plan, the MPO Congestion Management Process and any other applicable state or regional plans performance based 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.

## Safety Performance Measures

The FHWA final rule for the *National Performance Management Measures: Highway Safety Improvement Program* (Safety PM) and *Highway Safety Improvement Program* (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.

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 as the five-year rolling averages to include:

- 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 Planning and Programming process was utilized as bases for PennDOT and MPO/RPO coordination on the State's safety targets.

The coordinated efforts to deliver the Safety Targets began back in April of 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 of 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 PA.

Pennsylvania's current [Strategic Highway Safety Plan \(SHSP\)](#) was updated in early 2017. It 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. The SHSP contains Pennsylvania's statewide goals for fatalities and serious injuries over the next 3-4 years. The SHSP was developed and will be updated in conjunction with stakeholders including federal, state, local and private sector agencies including Pennsylvania's MPOs/RPOs.

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 MPO/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 collected traffic volumes for about 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 evaluate it for overall trends. PennDOT will compare these trends to what was 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 Death initiative.

PennDOT will share both the statewide data and planning region specific findings with the MPOs/RPOs to assist them in their decision-making process as to whether they were going to support the State's targets or adopt their own. SPC also evaluated regional trends over a 15 year period (2002-2016).

PennDOT evaluated the overall trends for the states crash and fatality data for the Baseline (2012-2016) and Target (2014-2018) periods. Over the past several years' data yielded a downward trend of approximately one percent. This was then compared to what was observed at a national level. Nationally these same numbers were rising by almost seven percent per year. In support of the National Toward Zero Death initiative there was the desire to be aggressive in trying to further push down the numbers in PA. This coupled with emerging technologies like autonomous vehicles lead all those involved to the belief that a two percent annual reduce goal was both aggressive and obtainable. Upon reaching this conclusion PennDOT shared both the statewide data and planning region specific data to the MPO/RPO's 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 December 2017, SPC took action to endorse PennDOT's statewide Safety Performance Target of a 2% reduction for all five federal safety metrics for the 2014-2018 reporting period. The following table shows the CY 2018 Statewide Targets established based on 2% reduction of five-year average (2014-2018) and aggregated supporting regional SPC Targets.

Safety Performance Measure	Baseline (2012-2016)	Statewide Target (2014-2018)	SPC Target (2014-2018)
Number of fatalities	1,220.2	1,177.6	221.5
Rate of fatalities per 100 million VMT	1.220	1.161	1.072
Number of serious injuries	3,434.0	3,799.8	759.7
Rate of serious injuries per 100 million VMT	3.433	3.746	3.677
Number of non-motorized fatalities and non-motorized serious injuries	602.4	654.4	97.9

The targets for number of fatalities, number of serious injuries and rate of fatalities need to be identical in submission to National Highway Traffic Safety Administration (NHTSA). PennDOT included the required three targets in the [Federal Fiscal Year 2018 Pennsylvania Highway Safety Plan](#) submitted to NHTSA by July 1, 2017. PennDOT included all five targets as part of the [2017 Pennsylvania Highway Safety Improvement Program](#) annual report submitted to FHWA by August 31, 2017.

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 31 of each year. The state targets for number of fatalities, number of serious injuries and rate of fatalities needed to be identical in submission to National

Highway Traffic Safety Administration (NHTSA). PennDOT will submit the state targets as part of the annual Pennsylvania Highway Safety Plan submitted to NHTSA by July 1 of each year.

### Reporting on Progress toward Target Achievement

The 2019 STIP and individual 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 2017 Strategic Highway Safety Plan (SHSP) through a data-driven safety analysis, and the use of low-cost safety improvements system-wide support achieving these reductions.
- In January 2017 the HSIP funding site was opened in 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 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).
- Pennsylvania started using the PA Regionalized Safety Performance Functions (SPFs) developed for a statewide network screening of about 20,000 locations. These new evaluations will use the Highway Safety Manual (HSM)'s 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.

PennDOT will continue to include information on Safety Targets and progress towards meeting 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 2014-2018 HSIP targets in December of 2019. Four of the five measures will need to be met or significantly improved upon. FHWA will utilize 2012-2016 data as a base line period for assessing significant progress. FHWA will report their findings to PennDOT by March 2020.

A discussion of investments made to safety related projects is included in Section 5 of the TIP Summary.

## **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 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 establishes a set of performance measures for State DOTs and MPOs to use as required by the 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 which 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 investments of Federal-aid funds in highway construction are 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:

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

## **Coordination on Target setting:**

State 2-year and 4-year targets were due May 20, 2018 and will also be reported to FHWA in the 2017 baseline report due October 2018. 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. Specific coordination efforts are highlighted below:

- A Transportation Asset Management Plan Steering Committee was formed in January 2017.
  - 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 purpose is to manage and coordinate the development, submission, and implementation of the Transportation Asset Management Plan (TAMP), and the pavement and bridge condition performance measures.
  - The Steering Committee met on January 4, 2017, February 6, 2017, September 21, 2017, October 31, 2017, November 13, 2017, December 21, 2017, and April 16, 2018.
- 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 worked to develop the *Pennsylvania Department of Transportation MAP-21 and FAST Act Performance Management Road Map* to provide Planning Partners a resource on the performance measure requirements and calculations

Any portion of the applicable transportation network within the SPC region, must establish targets for the performance measures no later than 180 days after PennDOT establishes (or amends in future) their targets. SPC must establish targets by either agreeing to support the State target or establishing our own quantifiable target.

### **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 is used for this 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 table below 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 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 that 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 that reported section does not provide sufficient 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:

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.” Data from 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 the 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.

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

Pavement Performance			
Measure	Baseline 2017	2-year Target 2019	4-year Target 2021
% of Interstate pavements in Good condition	67.2 %	N/A	<b>60.0 %</b>
% of Interstate pavements in Poor condition	0.4 %	N/A	<b>2.0 %</b>
% of non-Interstate NHS pavements in Good condition	36.8 %	<b>35.0 %</b>	<b>33.0 %</b>
% of non-Interstate NHS pavements in Poor condition	2.3 %	<b>4.0 %</b>	<b>5.0 %</b>

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.

Bridge Performance			
Measure	Baseline 2017	2-year Target 2019	4-year Target 2021
% of NHS bridges by deck area classified in Good condition	25.6 %	<b>25.8%</b>	<b>26.0 %</b>
% of NHS bridges by deck area classified in Poor condition	5.5 %	<b>5.6%</b>	<b>6.0%</b>

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 towards target achievement

PennDOT will need to report on performance at regular intervals. The first State DOT baseline performance period report is 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.

### System Performance Measures

The FHWA final rule for the *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* was published in the Federal Register ([82 FR 5970](#)) on January 18, 2017 and became effective on May 20, 2017.

This final rule is the third in a series of three related rulemakings that together establishes a set of performance measures for state DOTs and MPOs to use as required by the MAP–21 and the FAST Act. The measures in this third final rule will be 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:

- 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
- Interstate System Truck Travel Time Reliability Index
- Annual Hours of Peak-Hour Excessive Delay (PHED) per Capita

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

### **Coordination on Target setting**

State 2-year and 4-year targets were due May 20, 2018 and will also be reported to FHWA in the 2017 baseline report due October 2018. 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. Specific coordination efforts are highlighted below:

- 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 conducted a performance measure workshop on February 26-27, 2018 with the Pittsburgh, Philadelphia and York MPO planning staff to evaluate baseline performance measure trends and methodologies for target setting.
- 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 worked to develop the Pennsylvania Department of Transportation MAP-21 and FAST Act Performance Management Road Map to provide Planning Partners a resource on the performance measure requirements and calculations.

Any portion of the applicable transportation network within the SPC region, must establish targets for the performance measures no later than 180 days after PennDOT establishes (or amends in future) their targets. SPC must establish targets by either agreeing to support the State target or establishing our own quantifiable target.

### **Data Collection and Analysis:**

PennDOT has worked to identify and evaluate the data and tools used to produce the baseline performance measures. The University of Maryland CATT Lab 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. Future revisions and modifications to these tools may impact the reported performance measures and established targets.

### State System Performance Measure (PM3) Targets:

Due to potential tool enhancements, limited historic information, and the need for additional research understanding 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 next two years. 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 will coordinate any updates to the performance measures with the Planning Partners. SPC will also track the annual PHED and Non-SOV travel measures and revisit the estimated established 4-year targets at the mid-term period.

For the three reliability measures, PennDOT has set statewide targets (sub-state targets are optional). MPO baseline reliability measures have been provided for information purposes only. For the first performance period, the annual peak hour excessive delay and non-SOV travel measures must be developed for the Pittsburgh and Philadelphia urbanized areas only. PennDOT has worked closely with SPC and DVRPC to develop these targets and to include the necessary multi-state coordination partners in the target-setting process. The mobile source emission measure targets are produced statewide and for 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 (CMAQ) program funds.

<b>Travel Time and Annual Peak Hour Excessive Delay Measures</b> (Estimated using RITIS Data Extract from May 8, 2018)			
<b>Measure</b>	<b>Baseline 2017</b>	<b>2-year Target 2019</b>	<b>4-year Target 2021</b>
<b>Interstate Reliability (Statewide)</b>	89.8 %	89.8 %	89.8 %
<b>Non-Interstate Reliability (Statewide)</b>	87.4 %	N/A	87.4 %
<b>Truck Reliability Index (Statewide)</b>	1.34	1.34	1.34
<b>Annual Peak Hour Excessive Delay Hours Per Capita (Urbanized Area)</b>	SPC - 11.1	N/A	11.8

<b>PM-3 Baseline and Target Values for Non-SOV Travel Measure</b>			
<b>Measure</b>	<b>Baseline 2017</b>	<b>2-year Target 2019</b>	<b>4-year Target 2021</b>
<b>Percent Non-Single Occupant Vehicle Travel (Urbanized Area)</b>	SPC - 24.8 %	24.6%	24.4 %

<b>PM-3 Target Values for CMAQ Emission Measures</b>			
Applicable MPOs and Pollutants Determined from: <a href="https://www.fhwa.dot.gov/environment/air_quality/cmaq/measures/cmaq_applicability/page03.cfm#toc494364458">https://www.fhwa.dot.gov/environment/air_quality/cmaq/measures/cmaq_applicability/page03.cfm#toc494364458</a>			
Measure	MPO	Emissions (kg/day)	
		2-year Target* 2019	4-year Target 2021
VOC Emissions	Statewide	109.460	201.730
	SPC	<b>58.060</b>	<b>107.000</b>
NOx Emissions	Statewide	337.700	612.820
	SPC	<b>256.110</b>	<b>464.770</b>
PM <sub>2.5</sub> Emissions	Statewide	10.760	20.490
	SPC	<b>7.010</b>	<b>13.350</b>
PM <sub>10</sub> Emissions	Statewide	9.540	17.470
	SPC	9.540	17.470
CO Emissions	Statewide	567.700	1135.400
	SPC	<b>284.970</b>	<b>569.930</b>

\* 2-year emission targets are only applicable for states and for MPOs with populations >1 million. MPOs with populations < 1 million are not required to report 2-year emission targets. The values were used to establish statewide 2-year targets.

### Progress Towards Target Achievement and Reporting:

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

SPC must establish targets for the performance measures no later than 180 days after PennDOT establishes (or amends in future) their targets. SPC must establish targets by either agreeing to support the State target or establishing our own quantifiable target. SPC must develop a CMAQ Performance plan for monitoring progress toward targets, reporting progress to PennDOT for inclusion in PennDOT's performance reports. The CMAQ performance plan will also include a process for reviewing and revising targets on a regular 2 year cycle.

### Transit Performance Measures

The regulations required the U.S. Department of Transportation/Federal Transit Administration (FTA) to develop a strategic and systematic process of operating, maintain and improving public capital assets based on their life cycle.

The Transit Asset Management Final Rule [49 CFR part 625](#), effective October 2016, established four performance measures for transit. The following performance measures are a minimum standard for measuring and monitoring transit operators:

1. Rolling stock – vehicles used for providing public transportation, revenue and non-revenue
2. Equipment – articles on non-expendable, tangible property with a useful life of at least one year
3. Facilities – building or structure used in providing public transportation
4. Infrastructure – the underlying framework or structures that support the public transportation system

A Transit Asset Management (TAM) Plan is required to be in place for transit operators by October 1, 2018.