

Transportation Performance Management

The Bipartisan Infrastructure Law (BIL) continues the requirements established in Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America's Surface Transportation (FAST) Act for performance management. These requirements aim to promote the most efficient investment of Federal transportation funds. Performance-based planning ensures that the Pennsylvania Department of Transportation (PennDOT) and the Lehigh Valley Transportation Study (LVTS MPO) collectively invest Federal transportation funds efficiently towards achieving national goals.

Transportation Performance Management (TPM) is a strategic approach that uses data to make investment and policy decisions to achieve national performance goals. [23 USC 150\(b\)](#) outlines the national performance goal areas for the Federal-aid program. This statute requires the Federal Highway Administration (FHWA) to establish specific performance measures for the system that address these national goal areas. The regulations for the national performance management measures are found in [23 CFR 490](#).

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

The LVTS MPO continues to follow a Performance Based Planning and Programming (PBPP) process, with a focus on collaboration between PennDOT and FHWA. 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
- Public Transportation Agency Safety Plans (PTASP)

- 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)

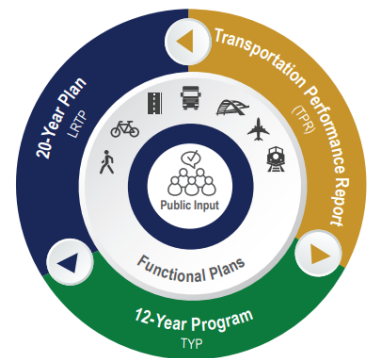
The above documents in combination with data resources including PennDOT’s bridge and pavement management systems, crash databases, historical travel time archives, and the CMAQ public access system provide the resources to monitor federal performance measures and evaluate needs across the state. Based on these resources, PennDOT and the LVTS MPO have worked together to (1) create data driven procedures that are based on principles of asset management, safety improvement, congestion reduction, and improved air quality, (2) make investment decisions based on these processes, and (3) work to set targets that are predicted to be achieved from the programmed projects. Aligning goals and performance objectives across national (FHWA), state (PennDOT) and the LVTS MPO provide a common framework for decision-making.



PennDOT, in cooperation with the LVTS MPO, 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.

Evaluating 2023-2026 STIP Performance

The LVTS MPO Fiscal Year (FFY) 2023-2026 Transportation Improvement Program (TIP) supports the goal areas established in PennDOT’s current long range transportation plan (Pennsylvania 2045). These include safety, mobility, equity, resilience, performance and resources. The goals are 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. Since asset management, reliability and CMAQ targets have not yet been set for the 2022-2025 performance period, the current project selection process for the FY2023-2026 TIP is highlighted and related to meeting future targets. 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 the LVTS MPO 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				
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). The current regulations are found at 23 CFR 490 Subpart B and 23 CFR 924 . Targets for the safety measures are established on an annual basis.				
Data Source				
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).				
2020 Safety Measures and Targets (Statewide)				
Measure	Statewide		LVTS MPO	
	Baseline (2016-2020)	Target (2018-2022)	Baseline (2016-2020)	Target (2018-2022)
Number of fatalities	1,140.6	1,113.7	50.2	48.6
Rate of fatalities per 100 million VMT	1.157	1.205	0.981	1.007
Number of serious injuries	4445.6	4,490.8	184.8	204.0
Rate of serious injuries per 100 million VMT	4.510	4.860	3.612	4.227
Number of non-motorized fatalities & serious injuries	761.2	730.1	37.2	32.9
Methods for Developing Targets				
An analysis of Pennsylvania’s historic safety trends 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 2% annual reduction for fatalities and maintaining levels for suspected serious injuries, 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.				

Progress Towards Target Achievement and Reporting:

The LVTS MPO and PennDOT continue efforts to ensure the TIP and Long-Range Transportation Plans (LRTPs) are developed and managed to support progress toward the achievement of the statewide safety targets. The LVTS MPO has 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 18 Safety Focus Areas (SFAs) that have the most influence on improving highway safety throughout the state. Within the SHSP, PennDOT identifies 3 key emphasis areas to improve safety – impaired driving, lane departure crashes, and pedestrian safety.

2022 SHSP Safety Focus Areas			
Lane Departure Crashes	Speed & Aggressive Driving	Seat Belt Usage	Impaired Driving
Intersection Safety	Mature Driver Safety	Local Road Safety	Motorcycle Safety
Pedestrian Safety	Bicycle Safety	Commercial Vehicle Safety	Young & Inexperienced Drivers
Distracted Driving	Traffic Records Data	Work Zone Safety	Transportation Systems Management & Operations
Emergency Medical Services	Vehicle-Train Crashes		

Pursuant to 23 CFR 490.211(c)(2), a State Department of Transportation (DOT) has met or made significant progress toward meeting its safety performance targets when at least 4 of the 5 safety performance targets established under 23 CFR 490.209(a) have been met or the actual outcome is better than the baseline performance for the year prior to the establishment of the target. For Pennsylvania's 2020 targets, the FHWA determined in March 2022 that Pennsylvania did not meet the statewide targets and is subject to the provisions of 23 U.S.C. § 148 (i). This requires the Department to submit an implementation plan that identifies gaps, develops strategies, action steps and best practices, and includes a financial and performance review of all HSIP funded projects. In addition, the Department is required to obligate in Federal Fiscal Year (FFY) 2023 an amount equal to the FFY 2019 HSIP apportionment.

As part of the Highway Safety Improvement Program Implementation Plan, the Department identified gaps and best practices to support further reducing serious injuries and fatalities. The following opportunities were identified as ways to assist with meeting future targets: (1) appropriate project selection, (2) expanding local road safety in HSIP, (3) assessing programs that support non-motorized safety, (4) expanding use of systemic safety projects, (5) improved project tracking for evaluation purposes and (6) project prioritization for greater effectiveness.

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.

Evaluation of STIP for Target Achievement:

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

- PennDOT receives federal funding for its Highway Safety Improvement Program (HSIP). The 2023-2026 STIP includes \$520 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. A complete listing of the HSIP projects is included in **below**:

Highway Safety Improvement Program	Funding Allocation
State Route 29 Improvements Shimersville Hill Safety Improvement Project	\$ 7,419,502
Route 145 (MacArthur Road) Safety Improvements	\$ 3,604,875
Route 191/Newburg Road Intersection Improvements	\$ 1,539,630
25 th Street Hill Improvement	\$ 506,475
Freemansburg Avenue (SR 2018)/Farmersville Road Safety Improvements	\$ 556,200
High Friction Surfacing	\$ 840,000
Safety Line Items	\$ 6,290,879
LVTS Low Cost Signal Upgrades	\$ 190,000
Total	\$ 20,947,561

- All projects utilizing HSIP funds are evaluated based on a Benefit/Cost (B/C) analysis, Highway Safety Manual (HSM) analysis, fatal and injury crashes, application of systemic improvements, improvements on high-risk rural roads, and deliverability. Specifically, as part of PennDOT's HSIP application process, a data-driven safety analysis in the form of B/C analysis or HSM analysis is required. Performing this analysis early in the planning process for all projects will help ensure projects selected for inclusion in the TIP will support the fatality and serious injury reductions goals established under PM1.
- The process for selecting safety projects for inclusion in the TIP begins with the Network Screening Evaluation that the Department has performed on a statewide basis. Selecting locations with an excess crash frequency greater than zero from this network screening is key to identifying locations with a high potential to improve safety. This evaluation has been mapped and is included in PennDOT's OneMap to ease use by PennDOT's partners. At the current time, this is not all inclusive for every road in Pennsylvania. Locations not currently evaluated may be considered by performing the same type of excess crash frequency evaluation the Department utilizes. Once this analysis has been performed, the data is used by the Engineering Districts and planning partners to assist MPO/RPO's in evaluating different factors to address the safety concern
- 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 new strategies are incorporated into future updates to 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.
- 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. 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.

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

- PennDOT’s Safety and Mobility Initiative (SAMI) funding has also been used to address other safety needs within LVTS MPO:

Safety and Mobility Initiative Projects	Funding Allocation
Corridor Signal Improvement Line Items	\$ 4,665,070
Urban ITS funding	\$ 3,502,000
Transportation Operations Center operations	\$ 100,000
State Route 29/Cedar Crest Boulevard Signal Improvements	\$ 460,750
MacArthur Road Signal Improvements	\$ 2,398,000
State Route 309 Center Valley Interchange	\$ 22,562,225
Mauch Chunk Road Signal Upgrades	\$ 344,400
All Weather Pavement Markers	\$ 800,000
State Route 248 Signal Upgrades	\$ 1,339,000
Total	\$ 36,171,445

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. The current regulations are found at 23 CFR 490 Subpart C and Subpart D . Targets are established for these measures as part of a four-year performance period, the first was 2018 to 2021. This TIP includes projects that will impact the second four-year performance period of 2022 to 2025.			
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).			
2022-2025 Pavement Performance Measure Targets (Statewide) – Due October 1 st 2022			
Measure	Baseline 2021	2-year Target 2023	4-year Target 2025
% of Interstate pavements in Good condition	TBD	TBD	TBD
% of Interstate pavements in Poor condition	TBD	TBD	TBD
% of non-Interstate NHS pavements in Good condition	TBD	TBD	TBD
% of non-Interstate NHS pavements in Poor condition	TBD	TBD	TBD
Bridge Performance Measure Targets (Statewide)			
Measure	Baseline 2021	2-year Target 2023	4-year Target 2025
% of NHS bridges by deck area in Good condition	TBD	TBD	TBD
% of NHS bridges by deck area in Poor condition	TBD	TBD	TBD
Methods for Developing Targets			

Pennsylvania's pavement and bridge targets will be established by October 2022 through extensive coordination with a Transportation Asset Management Plan (TAMP) steering committee and workshops with MPOs/RPOs and FHWA's Pennsylvania Division. The targets will be 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 Targets are expected to be calculated based general system degradation (deterioration curves) offset by improvements expected from delivery of the projects in the TIP along with planned state funded maintenance projects.

Progress Towards Target Achievement and Reporting:

PennDOT continues to implement enterprise asset management for programming and decision-making as outlined in the TAMP.³ PennDOT is transitioning to the new TAMP that was finalized in the summer of 2022. 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 goals established in the TAMP.

PennDOT and the LVTS MPO continue to ensure regional TIPs and LRTPs are developed and managed to support progress toward the achievement of the statewide pavement/bridge objectives and targets that will be established for the 2022-2025 performance period. Pennsylvania's pavement and bridge projects provided in the FY2023-2026 TIP were selected through extensive coordination with PennDOT's Asset Management Section in accordance with the TAMP. The projects 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.

After the 2022-2025 performance targets are set, PennDOT will provide feedback on statewide and LVTS MPO-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.

Proposed Bridge and Pavement projects are evaluated against LVTS MPO goals and policies documented in the long-range plan. Those goals and policies are consistent with the regional comprehensive plan. The following are relevant policies regarding project selection:

- Plan Consistency- Projects must comply with the transportation goals and policies of the LVTS and *FutureLV: The Regional Plan* adopted by Lehigh and Northampton Counties in June 2019.

² For more information on LLCC: <https://www.penndot.gov/ProjectAndPrograms/Asset-Management/Documents/Lowest-Life-Cycle-Cost-Infographic.pdf>

³ PennDOT TAMP: <https://www.penndot.pa.gov/ProjectAndPrograms/Asset-Management/Pages/default.aspx>

- Give high priority to projects that upgrade unsafe roads and intersections, rehabilitate, or replace deficient bridges and upgrade existing highways that are deficient.
- Priority will only be given to bridges deemed structurally deficient. Bridges with a sufficiency rating of 0 to 50 are eligible for replacement. Bridges with a sufficiency rating of 50 to 80 are eligible for rehabilitation. All other bridges are eligible for preventative maintenance improvements only.
- Improve the overall ratings of pavement and bridges on the regional freight transportation system.

These policies indicate the types of projects the LVTS MPO is willing and not willing to fund. LVTS MPO applies the policies in our long-range plan noted above and also considers potential impacts to land use and the natural and built environments, key issues in the regional comprehensive plan.

Evaluation of STIP for Target Achievement:

The following has helped to ensure that planned projects in the STIP will help to maintain a desired state of good repair in bridge and pavement conditions for the interstate and NHS roadways:

- Nearly 68% of the 2023-2026 LVTS MPO TIP Funding is directed to highway and bridge preservation, restoration, and reconstruction projects. Many of these projects are focused on our state's interstate and NHS roadways.
- Pennsylvania's investment strategy, reflected in the statewide 2023 Twelve Year Program (TYP) and 2023-2026 STIP, is the result of numerous strategic decisions on which projects to advance at what time. PennDOT continues to address the challenges of addressing local needs and priorities, while ensuring a decision framework is applied consistently across the state.
- The TAMP provides a 12-year outlook that includes the financial strategy for various work types and is a driver for the TIP, STIP and LRTP development. The TAMP projects the levels of future investment necessary to meet the asset condition targets and contrasts them with expected funding levels. This helps PennDOT to make ongoing assessments and to reevaluate data associated with its future investment decisions.
- In support of the STIP development, PennDOT and the LVTS MPO jointly developed and approved General and Procedural Guidance and Transportation Program Financial Guidance documents.⁴ The guidance, which is consistent with the TAMP, formalizes the process for Districts, the LVTS MPO and other interested parties as they identify projects, perform a project technical evaluation, and reach consensus on their portion of the program.
- 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 and risk mitigation. The resulting methodology allows data-driven, asset management-based decisions to be made with human input and insight based on field evaluations 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.
- In the short term, candidate projects are defined, and the proposed program is compared to Pavement Asset Management System (PAMS) and Bridge Asset

⁴ The 2023 Financial Guidance can be found at: <https://talkpatransportation.com/how-it-works/tip>

Management System (BAMS) outputs to verify that the program is developed to the lowest practical life cycle cost. The percentages of good and poor can also be projected for evaluation of how the program may impact the national performance measures. When PAMS and BAMS are further implemented and improved, then planners can use the systems to optimize the selection of projects to achieve optimal performance within the funding constraints. Draft programs can then be analyzed in relation to the PM2 measures.

Lowest life cycle cost methodology is taken into account by both PennDOT District 5 and the LVTS MPO. It has been the LVTS MPO practice to rely on PennDOT District 5 to develop bridge priorities. Highest priority is given to closed bridges, posted bridges, and then bridges that are structurally deficient. PennDOT’s bridge asset management system is considered in this process which takes into account both surface deck area and lane miles. Maintenance projects are also generally proposed and prioritized by PennDOT District 5. As is the case with bridges, LVTS MPO generally defers to PennDOT’s expertise on issues like life-cycle costing and maintenance cycles when addressing these projects. Smaller maintenance projects are handled “off program” using PennDOT maintenance funds. International Roughness Index and Overall Pavement Index are utilized in evaluating maintenance of roadways for inclusion.

Bridge and Pavement projects and funding information:

Spike/Discretionary Funding for Bridges and Pavement	Funding Allocation
State Route 22 Resurfacing: Farmersville Road to State Route 512	\$ 5,500,000
State Route 145 Safety Improvements	\$ 3,000,000
LVTS High Friction Surfaces	\$ 1,400,000
Total	\$ 9,900,000

Key Bridge and Pavement Projects	Project Improvement Focus	Funding Allocation
Jordan Creek Bridge Expansion	Bridge Replacement and Design Improvements	\$ 4,525,050
SR 145 Safety Improvements	Infrastructure Design, Pavement Preservation and Safety Improvements	\$ 7,338,750
PA 309 Resurface,395	Pavement Preservation	\$ 12,730,800
Hill to Hill Bridge	Bridge Preservation	\$ 21,171,500
Gap Bridge Repairs	Bridge Preservation	\$ 9,335,920
Cementon Bridge	Bridge Replacement	\$ 2,500,000
South Walnut Street Bridge	Bridge Rehabilitation / Replacement, Design Improvements	\$ 6,521,040
Fifth Street Bridge	Bridge Replacement	\$ 8,122,580
SR 33 Bushkill Creek Bridges	Bridge Rehabilitation / Replacement	\$ 18,786,685
Farmersville Road Bridge over SR 22	Bridge Rehabilitation / Replacement	\$ 3,820,395
SR 22 Resurfacing	Pavement Preservation	\$ 5,500,000
Linden Street Resurfacing	Pavement Preservation	\$ 4,207,400
	Total	\$ 104,560,120

The above projects along with all the bridge and pavement projects within the LVTS MPO TIP will have a positive effect on achieving the performance goals to be set by PennDOT. The 2022-2025 Pavement Performance Measure Targets (Statewide) have not been set and will not be set until October 2022. The bridge and pavement projects are in line with the goals and

policies of FutureLV: The Regional Plan. The projects will ensure that the Lehigh Valley continues to be a connected mixed-transportation region and that the LVTS MPO TIP will provide for a safe, well-maintained transportation network to move people and goods efficiently, while capitalizing on existing infrastructure.

System Performance Measures (PM3)

Background			
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). The current regulations are found at 23 CFR 490 Subparts E, F, G & H . Targets are established for these measures as part of a four-year performance period, the first was 2018 to 2021. This TIP includes projects that will impact future performance periods based on when projects are constructed or completed.			
Data Source			
The Regional Integrated Transportation Information System (RITIS) software platform is used to generate 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.			
Travel Time and Annual Peak Hour Excessive Delay Targets - Due October 1 st 2022			
Measure	Baseline 2021	2-year Target 2023	4-year Target 2025
Interstate Reliability (Statewide)	TBD	TBD	TBD
Non-Interstate Reliability (Statewide)	TBD	TBD	TBD
Truck Reliability Index (Statewide)	TBD	TBD	TBD
Annual Peak Hour Excessive Delay Hours Per Capita (Urbanized Area)	Philadelphia - TBD	TBD	TBD
	Pittsburgh – TBD	TBD	TBD
	Reading	TBD	TBD
	Allentown	TBD	TBD
	Harrisburg	TBD	TBD
	York	TBD	TBD
	Lancaster	TBD	TBD
Non-SOV Travel Measure Targets			
Measure	Baseline 2021	2-year Target 2023	4-year Target 2025
Percent Non-Single Occupant Vehicle Travel (Urbanized Area)	Philadelphia - TBD	TBD	TBD
	Pittsburgh – TBD	TBD	TBD
CMAQ Emission Targets			
Measure		2-year Target 2023	4-year Target 2025
VOC Emissions (Statewide)		TBD	TBD
NOx Emissions (Statewide)		TBD	TBD
PM2.5 Emissions (Statewide)		TBD	TBD
PM10 Emissions (Statewide)		TBD	TBD
CO Emissions (Statewide)		TBD	TBD

Methods for Developing Targets

The System Performance measure targets will be established by October 2022 in coordination with the LVTS MPO. PennDOT continues to evaluate historic variances in performance measures in relation to project completion to assist with the target setting process.

Progress Towards Target Achievement and Reporting:

PennDOT and the LVTS MPO continue efforts to ensure the regional TIP and LRTP are developed and managed to support the improvement of the reliability and CMAQ performance measures. This future progress will be measured against the targets established for the 2022-2025 performance period. PennDOT continues to monitor the impacts of completed investments on performance measures to better evaluate investment strategies. These efforts include evaluating the causes of historic reliability and delay issues, identifying freight bottlenecks, and assessing completed projects that provided the most benefits to reliability.

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 LRTP provides objectives to address mobility across the transportation system that will guide investment decisions. The federal systems performance measures will be used to assess future progress in meeting these objectives and the associated targets.

PennDOT LRTP Mobility Goal and Objectives

MOBILITY

Strengthen transportation mobility to meet the increasingly dynamic needs of Pennsylvania residents, businesses, and visitors.

- Continue to improve system efficiency and reliability.
- Continue to improve public transportation awareness, access, and services throughout Pennsylvania.
- Provide and prioritize multimodal transportation choices to meet user needs, expand mobility options, and increase multimodal system capacity and connectivity.
- Implement regional transportation, land use standards, and tools that result in improved multimodal coordination and complementary development.
- Adapt to changing travel demands, including those associated with e-commerce and post-COVID-19 pandemic changes.
- Work with private sector partners to establish data standards for mobility services and their applications (e.g., Uber and Lyft, carsharing services, bikeshares, etc.)

In support of the System Performance Measures (PM3), the LVTS MPO will work with PennDOT, NJDOT, the Delaware Valley Regional Planning Commission, the North Jersey Transportation Planning Authority, the Northeastern Pennsylvania Planning Alliance MPO and the Reading Area Transportation Study to provide targets for the percent non-single occupant vehicle travel and the peak hour excessive delay per capita for the Allentown-Bethlehem-Easton PA-NJ Urbanized Area. The threshold for target setting has been lowered to Urbanized Areas greater than 200,000 people with final target setting set for October 1, 2022. The LVTS MPO, PennDOT and all partner agencies will continue efforts to ensure regional TIPs and LRTPs are developed and managed to support progress toward the achievement of the new system performance targets to be set in October 2022.

Evaluation of LVTS MPO TIP for Target Achievement:

The following has helped to ensure that planned projects in the LVTS MPO TIP 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 2023-2026 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 past and planned STIP investments on PM-3 performance measures are still being evaluated. The timeline for project implementation often prevents an assessment of measurable results until a number of years after project completion. 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 in relation to other factors including incidents and weather on system reliability and delay.

Proposed projects are evaluated against the LVTS MPO goals and policies documented in the long-range plan. Those goals and policies are consistent with the regional comprehensive plan. The following are relevant policies regarding project selection on projects which will work to ensure a positive effect on system performance measures:

- Projects with a mobility justification must have documented evidence of existing or forecasts of future congestion. Projects must be identified in the Congestion Management Process.
- New and/or expanded facilities must be justified primarily on the basis of current or future congestion or safety problems. Secondary factors, such as access improvement and economic development, may be given consideration to the degree that they support the goals and policies of the FutureLV: The Regional Plan and that financial resources are available.
- Congestion relief and access improvement projects shall address intermodal connections where such connections are appropriate.

- This plan supports transportation system management, operations strategies, intelligent transportation systems, access management practices, context sensitive design and other innovative transportation practices in appropriate situations.
- Travel demand on existing facilities should be met to the greatest degree possible by programming low-cost safety and mobility improvements.
- Support development for park and ride lots where there is documented demand for such facilities.
- Improve sidewalk, trail, and local street connectivity to offer multimodal options to reduce the number of vehicle trips taken on the major highway network; encourage growth and revitalization of the region's urbanized areas; and support social, cultural, and economic equality.
- Promote transportation infrastructure improvement, such as road diets, shoulder improvements, sidewalks, and crosswalks, to resolve bicycle and pedestrian safety issues.
- Promote construction of missing links in the bicycle and pedestrian networks.
- Support Safe Routes to School projects.

LVTS MPO Congestion Management and Air Quality (CMAQ)

Projects proposed with a justification of congestion mitigation must be on the LVTS MPO congestion management process (CMP) to be considered. The CMP is developed using the LVPC's regional travel forecast model and there are several screens the projects go through before being included on the CMP. First, projects must be on a freeway, major arterial, or minor arterial, must be at least a mile long, have an average level-of-service of "D" or worse, and not have had publicly funded improvements in the last 20 years. After completing the modeling analysis and identifying the most congested segments, a methodology for identifying a limited number of priority corridors was developed utilizing the following criteria:

- Location on the National Highway System - The NHS includes the Interstate Highway System as well as other roads important to the nation's economy, defense, and mobility.
- Percentage of Truck Traffic – The percentage of truck traffic to total traffic reflects the importance of the corridor to regional goods movements.
- Location in the area recommended for urban development – This area is depicted in the LVPC Comprehensive Plan and indicates the consistency of the corridor with surrounding areas that are targeted for future development. The Comprehensive Plan includes a general land use plan that classifies all areas of the region based upon their suitability for future development.
- Functional Classification – Organizes roads based upon their importance to carrying through traffic versus local traffic.

Congested corridors were assigned numerical ratings using these criteria in order to identify the highest priority corridors. For the first criterion, corridors were given a rating of 1.0 if all segments of the corridor were designated as part of the National Highway System, 0.5 if some segments are on the NHS, 0.0 if no segments are on the NHS. The second criterion assigned 1.0 points to those corridors where all segments have 10% or greater truck traffic, 0.5 points if some segments have 10% or greater truck traffic, or 0.0 points if no segments do. The last

criterion assigned 1.0 points to corridors lying completely within the area recommended for urban development, 0.5 points to corridors in which some segments lie in these areas, and 0.0 points if all segments are located outside the area recommended for urban development. The three criteria ratings were added together into a total point rating. Corridors with a total rating of at least 2.5 were selected as priority corridors, as were corridors with a rating of 2.0 that had a level of service F in 2040. Corridors were given a higher numerical rating if they are on the National Highway System

In an effort to strengthen the land use/transportation infrastructure investments link, LVTS maintains a policy that congestion problems outside the area recommended for urban development in *FutureLV: The Regional Plan* will NOT be addressed using Federal or state money available to the MPO, except in situations where only capacity adding improvements will effectively address safety concerns.

The LVTS MPO continues to seek to improve system performance measures as can be seen by the below project charts.

Spike/Discretionary Funding for Congestion and Air Quality	Funding Allocation
Low Cost Signal Upgrades	\$ 305,000
LVTS Urban ITS	\$ 586,250
Freeway Service Patrol	\$ 154,980
Total	\$ 1,046,230

2023-2026 Key Congestion and Air Quality Projects	Funding Allocation
LVTS CMAQ LANTA Flex	\$ 3,360,000
Corridor Signal Improvements Line Item	\$ 4,665,070
LVTS Urban Intelligent Transportation Systems	\$ 3,502,000
SR 29/Cedar Crest Boulevard Signal Upgrades	\$ 460,750
MacArthur Road (SR 145) Signal Upgrades	\$ 2,398,000
309 Center Valley Interchange	\$ 3,502,000
Mauch Chunk Road Signal Upgrades	\$ 344,400
SR 248 Signal Upgrades	\$ 1,339,000
Total	\$ 19,571,220

Transit Asset Management Performance Measures

Background				
<p>In July 2016, FTA issued a final rule (TAM 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 into two categories (tier I and II) based on size and mode. The TAM process requires agencies to annually set performance measure targets and report performance against those targets. For more information see: Transit Asset Management FTA (dot.gov)</p>				
Data Source				
<p>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, 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 except for Centre Area Transportation Authority (CATA), have elected to participate in the PennDOT Group Plan. The Group Plan is available on PennDOT's website at PennDOT Group Plan. The group plan is updated annually with new targets as well as the current performance of the group.</p>				
Transit Asset Management Targets (for all agencies in PennDOT Group Plan)				
Performance Measure	Asset Class	FY2020-21 Target	Current Performance	FY 2021-22 Target
Rolling Stock (Revenue Vehicles)				
<p>Age % of revenue vehicles within a particular asset class that have met or exceeded their Estimated Service Life (ESL)</p>	AO-Automobile	16%	18%	18%
	BR-Over-the-road Bus	12%	18%	18%
	BU – Bus	29%	28%	28%
	CU-Cutaway	42%	52%	52%
	VN-Van	64%	63%	63%
	SV-Sports Utility Vehicle	17%	33%	33%
Equipment (Non-Revenue Vehicles)				
<p>Age % of non-revenue/service vehicles within a particular asset class that have met or exceeded their ESL</p>	Automobiles	46%	57%	57%
	Trucks / Rubber Tire Vehicles	50%	27%	27%
Facilities				
<p>Condition % of facilities with a condition rating below 3.0 on the FTA TERM scale</p>	Administrative / Maintenance Facilities	30%	14%	14%
	Passenger / Parking Facilities	83%	84%	84%
Methods for Developing Targets				

PennDOT annually updates performance targets based on two primary elements: the prior year's performance and anticipated/obligated funding levels. PennDOT requires rolling stock and non-revenue vehicles (equipment) to meet both age and mileage ESL standards prior to being replaced. While the identified annual targets represent only age and condition in line with FTA guidelines, PennDOT will continue to apply age and mileage when making investment decisions.

Progress Towards Target Achievement and Reporting:

The Pennsylvania TAM Group Plan fulfills the PBPP requirement and encourages communication between transit agencies and their respective MPOs and RPOs. In accordance with the plan, the following actions take place that fulfill the PBPP requirement:

- PennDOT provides asset performance reports to transit agencies by August 31 of each year that measure performance against established targets for the previous fiscal year.
- Transit agencies review the content for accuracy and confirm with PennDOT that information related to transportation asset performance has been received and is accurate.
- Transit agencies share performance data with their respective planning partner by the end of each calendar year, or earlier as decided between the partners.
- New performance goals for the upcoming fiscal year are established no later than September 15 of each year and communicated to transit agencies covered under the group plan.
- Transit agencies continue regular coordination regarding the local Transportation Improvement Plan (TIP) and other planning initiatives of the local planning partner.

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.

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 ensures 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.

Evaluation of STIP for Target Achievement:

The STIP includes an investment prioritization process using established decision support tools. The investment prioritization process occurs annually as part of the capital budgeting process. To prioritize investments at an agency level and at a statewide level, the following basic actions take place:

- Update inventory in the CPT to include age, mileage, condition, and operational status
- Identify assets that are not in a state-of-good-repair, using the following priority process:
 - Vehicles that surpass age and mileage ESL
 - Vehicles that surpass age or mileage ESL and are rated in poor condition or represent a safety hazard
 - Facilities that have a condition rating of less than 3 on the TERM Scale, with priority given to facilities that are the lowest in the scale and represent a critical need to maintain operational capacity
- Determine available funding based on federal and state funding sources
- Develop projects within the CPT Planner based upon funds availability
- Import CPT Planner into DotGrants for the execution of capital grants

Throughout the process, PennDOT reviews projects and works with agencies to approve and move projects forward through the grant process.

LANTA 2021 TAM Performance Measures

Agency: Lehigh and Northampton Transportation Authority

1. Revenue Vehicles - Percent of revenue vehicles that have met or exceeded their useful life benchmark				
Performance Measure	2021 Target (%)	2021 Performance (%)	2021 Difference	2022 Target (%)
BU - Bus	29	0	-29	28
CU - Cutaway	42	54.90196078	12.90196078	52

2. Service Vehicles - Percent of service vehicles that have met or exceeded their useful life benchmark				
Performance Measure	2021 Target (%)	2021 Performance (%)	2021 Difference	2022 Target (%)
Automobiles	46	100	54	57
Trucks and other Rubber Tire Vehicles	50	14.28571429	-35.71428571	27

3. Facility - Percent of facilities rated 3 or below on the condition scale				
Performance Measure	2021 Target (%)	2021 Performance (%)	2021 Difference	2022 Target (%)
Administrative / Maintenance Facilities	30	0	-30	14

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. 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. The current LVTS 2023-2026 TIP funding guidance is for over \$90 million within Lehigh Valley Planning Commission

Specific asset management projects included in the LVTS MPO 2023-2026 TIP include the purchase of vans and minibuses, service vehicle replacement, heavy-duty bus purchases, and LANTA facility improvements and equipment.

Public Transit Safety Performance Measures

In addition to the Transit Asset Management Performance, FTA issued a final rule on Public Transportation Agency Safety Plans (PTASP), effective July 19, 2019. The PTASP final rule (49

C.F.R. Part 673) is meant to enhance safety by creating a framework for transit agencies to manage safety risks in their organization. It requires recipients of FTA funding to develop and implement safety plans that support the implementation of Safety Management Systems (SMS). At this time, recipients of only Section 5311 (Formula Grants for Rural Areas) or Section 5310 (Enhanced Mobility of Seniors and Individuals with Disabilities Program) are exempt from the PTASP requirement.

As part of the plan development process, performance targets must be established for the following areas:

1. Fatalities,
2. Injuries,
3. Safety Events, and System Reliability

All public transit agencies in the Commonwealth have written safety plans compliant with Part 673 as of July 20, 2021. These safety plans must be updated annually based on agency specific execution dates and shared with PennDOT BPT. It is also the transit agency's responsibility to share the updated plan with their respective MPO/RPO, so the new targets and measures can be incorporated into regional planning practices.

LANTA 2022 Transit Safety Performance Targets							
Mode of Transit Service	Fatalities (total)	Fatalities (per 10 thousand VRM)	Injuries (total)	Injuries (per 100 thousand VRM)	Safety Events (total)	Safety Events (per 100 thousand VRM)	System Reliability (VRM/failures)
Fixed Route Bus	0	0	4	7.7	9	3.4	67,472
ADA / Paratransit	0	0	0	0	0	0	132,009

These targets are specific numerical targets set by LANTA, based on review of LANTA's safety performance data for Fiscal Year 2021, and are based on the Safety Performance Measures established by FTA in the National Public Transportation Safety Plan. In the most recent version, the 2017 NSP3, FTA adopted four initial safety Performance Measures: (1) Fatalities, (2) Injuries, (3) Safety Events, and (4) System Reliability.

FTA requires that LANTA coordinate with PennDOT and the LVTS MPO to the maximum extent practicable. Pursuant to 49 CFR Part 673.15(a), LANTA will transmit safety performance targets available to PennDOT and the LVTS MPO to aid in the planning process upon certification of this plan. Additionally, LANTA will transmit performance data against the safety performance targets to PennDOT and the LVTS MPO on an annual basis.