

# Transportation Performance Management

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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.

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	
<b>Safety</b>	▪ To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
<b>Infrastructure Condition</b>	▪ To maintain the highway infrastructure asset system in a state of good repair
<b>Congestion Reduction</b>	▪ To achieve a significant reduction in congestion on the National Highway System
<b>System Reliability</b>	▪ To improve the efficiency of the surface transportation system
<b>Freight Movement and Economic Vitality</b>	▪ To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
<b>Environmental Sustainability</b>	▪ To enhance the performance of the transportation system while protecting and enhancing the natural environment
<b>Reduced Project Delivery Delays</b>	▪ 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
- 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 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 Wayne County 2021-2024 TIP Performance

The Wayne County Federal Fiscal Year (FFY) 2021-2024 Transportation Improvement Program (TIP) 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 Wayne County 2021-2024 TIP will support target achievement. Safety measures address all public roads. The pavement, bridge, and traffic reliability measures focus on the National Highway System (NHS). In Wayne County, only a 6-mile section of Interstate 84 is on the NHS, so the TIP program will have a limited impact on statewide measures. In addition, attributing projects to specific goal measures is difficult as many projects address multiple goal areas. Over the 4-year TIP, just over 88% of the total funding in Wayne County is associated with 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 the 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 (<a href="#">81 FR 13881</a> and <a href="#">81 FR 13722</a>) 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	<b>1,171.9</b>
Rate of fatalities per 100 million VMT	1.169	<b>1.148</b>
Number of serious injuries	3839.6	<b>4,400.3</b>
Rate of serious injuries per 100 million VMT	3.797	<b>4.309</b>
Number of non-motorized fatalities & serious injuries	679.0	<b>781.7</b>
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 <a href="#">Strategic Highway Safety Plan (SHSP)</a>, 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 across the state continue efforts to ensure regional TIP and Long Range Transportation Plans (LRTPs) are developed and managed to support progress toward the achievement of the statewide safety targets. Wayne County 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 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.

### **Evaluation of Wayne County TIP for Target Achievement:**

PennDOT District 4-0 continues to work to ensure that planned projects in Wayne County are consistent with PennDOT's statewide performance measure targets. In addition, the District continues to track the impacts of past safety investments to help guide future planning goals and strategy assessments. The following activities and projects aim to achieve a reduction of traffic fatalities and serious injuries within Wayne County:

- PennDOT receives federal funding for its Highway Safety Improvement Program (HSIP). 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. In the 2021-2024 Wayne County TIP, HSIP funding has been allocated to State Route 6 and Long Ridge Road in Texas Township. The planned improvements include turning lanes, geometry improvements, high friction surface treatments, lighting, signing and pavement markings.
- PennDOT's Safety and Mobility Initiative (SAMI) funding has also been used to address other safety needs within Wayne County. This includes safety improvements along State Route 191 and guiderail upgrades in the county.
- 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 roadway locations within Wayne County.<sup>1</sup>
- 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 TIP 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 TIP 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 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 TIP is supporting achievement of the safety targets.

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

## 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 ( <a href="#">82 FR 5886</a> ) 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. <sup>2</sup>			

### Progress Towards Target Achievement and Reporting:

PennDOT continues to implement enterprise asset management for programming and decision-making as outlined in the TAMP.<sup>3</sup> 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

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

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

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. PennDOT and the MPOs/RPOs continue to ensure the regional TIPs and LRTPs are developed and managed to support progress toward the achievement of the statewide pavement/bridge objectives and 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.

### **Evaluation of Wayne County TIP for Target Achievement:**

At this time, Wayne County has not established separate regional pavement or bridge targets. PennDOT District 4-0 continues to work to ensure that planned projects in Wayne County are consistent with PennDOT's statewide performance measure targets. The following activities and projects aim to achieve improvements in bridge and pavement conditions within Wayne County:

- Over 88% of Wayne County's TIP funding is directed to bridge restoration and reconstruction projects. However, within Wayne County, only about 6 miles of Interstate 84 is on the NHS. As such, the projects currently on the TIP will focus on improving bridge conditions within the county but will have limited impacts on the federal statewide PM-2 performance measures.
- 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.<sup>4</sup> 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.
- 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.
- 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.

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<sup>4</sup> The 2020 Financial Guidance can be found at: [www.talkpatransportation.com](http://www.talkpatransportation.com)

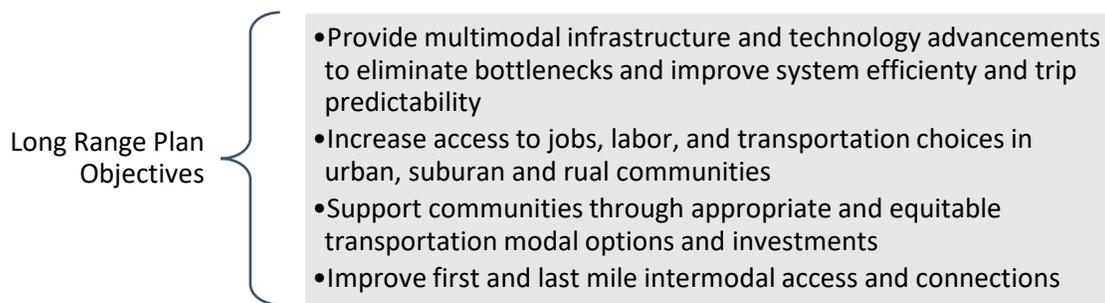
## System Performance Measures (PM3)

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 ( <a href="#">82 FR 5970</a> ) 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.			
Data Source			
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.			
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			
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.			

### Progress Towards Target Achievement and Reporting:

PennDOT and the MPOs/RPOs continue efforts to ensure regional TIPs and LRTPs 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 LRTP provides system performance objectives that guide investment decisions. These objectives are measured using multiple performance metrics including the federal systems performance measures.



### Evaluation of Wayne County TIP for Target Achievement:

PennDOT District 4-0 continues to work to ensure that planned projects in Wayne County are consistent with PennDOT's statewide PM-3 performance measure targets. Due to limited NHS road coverage and the region currently attaining air quality standards, the Wayne County TIP does not contain transportation projects that focus on mobility, reliability or air quality improvements. Needs related to the PM-3 measures have not been identified in the County. However, PennDOT will continue to monitor future needs through the following activities:

- 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.
- 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.
- PennDOT continues to evaluate multi-modal alternatives. Within Wayne County, this may include support for regional carpooling and bike/pedestrian infrastructure. These projects

provide opportunities to reduce vehicle miles of travel (VMT) and increase the percentage of non-single occupant vehicles.

- 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.

## 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 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 Wayne County Transportation System, which provides county-operated shared ride services, falls under this 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) (age only)
- Equipment – Percentage of service vehicles past the ULB (age only)
- 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. 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 2021-2024 TIP does not contain any transit investments within Wayne County.