Transportation Performance Management/Performance-Based Planning & Programming

2023-2026 TIP

SVATS
Shenango Valley Area Transportation Study
Metropolitan Planning Organization

Introduction

Within the past decade, federal legislation established new requirements to promote the most efficient investment of Federal transportation funds by measuring performance of the system through an increasingly data-driven approach to programming projects. The Federal Highway Administration (FHWA) uses the term Transportation Performance Management (TPM), which is "a strategic approach that uses data to make investment and policy decisions to achieve national performance goals." TPM is (1.) systematically applied, a regular ongoing process; (2.) Provides key information to help decision makers to understand the consequences of investment decisions across transportation assets or modes (3.) Improves communications between decision makers, stakeholders and the traveling public; and (4.) Ensures that targets and measures are developed in cooperative partnerships and based on data and objective information.

This concept, often colloquially referred to as performance measures, was introduced through 2012's Moving Ahead for Progress in the 21st Century Act (MAP-21), and 2015's Fixing America's Surface Transportation (FAST) Act further defined the setting of targets and continued this TPM approach. With the recent (2021) passage of the newest federal transportation bill—The Infrastructure Investment and Jobs Act (IIJA) a.k.a. Bipartisan Infrastructure Law (BIL)—sees this concept continuing, and demonstrates its perhaps permanent status as a focus of how projects are chosen and performance is evaluated. This approach ensures that the Pennsylvania Department of Transportation (PennDOT) and Metropolitan Planning Organizations (MPOs)—such as the Shenango Valley Area Transportation Study (SVATS)—collectively invest Federal transportation funds efficiently towards achieving national 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:

Safety	To achieve a significant reduction in traffic fatalities and serious injuries on all public roads
Infrastructure Condition	To maintain the highway infrastructure asset system in a state of good repair
Congestion Reduction	To achieve a significant reduction in congestion on the National Highway System
System Reliability	To improve the efficiency of the surface transportation system
Freight Movement & Economic Vitality	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	To enhance the performance of the transportation system while protecting and enhancing the natural environment
Reduced Project Delivery Delays	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

What Performance Based Planning and Programming Means to the SVATS MPO

The SVATS MPO follows a Performance Based Planning and Programming (PBPP) approach, with a focus on collaboration between the SVATS MPO, PennDOT District 1-0 and the Center for Program Development and Management (CPDM), FHWA, and our local transit partners in Mercer County. The collaborative development of documents and processes such as the MPO's/County's Long-Range Transportation Plan (LRTP), the Transportation Improvement Program (TIP), SVATS's Unified Planning Work Program (UPWP), the MPO's Congestion Management Process (CMP), District 1-0's Regional Operation Plan (ROP), and various other transportation planning studies covering Mercer County, all (increasingly) take into account a PBPP approach.

The aforementioned planning partners are increasingly utilizing various data resources to guide the development of these plans and processes, as well as the resulting decision-making that informs the programming of projects. Resources include, but are not limited to, Pennsylvania's Transportation Asset Management Plan (TAMP) including bridge and pavement management systems, the Transit Asset Management (TAM) plan, PennDOT crash databases, and traffic count data (both through traditional traffic counts and larger snapshots collecting real-time data through on-board travel data collection).

Through this process, we continue our commitment to a cooperative, continuing, and comprehensive (3C) planning process, one that is increasingly performance-based.

Evaluating Performance on the 2023-2026 TIP

The following sections provide an overview of the federal performance measures, established targets, and how the SVATS MPO's 2023-2026 TIP—and the Statewide TIP (STIP)—will support target achievement. 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 the needs of PennDOT as well as the SVATS MPO. Dashboards and other reporting tools will be maintained to track and communicate performance to the public and decision-makers.

To meet the requirements of federal law and rulemaking regarding PBPP, PennDOT, the SVATS MPO, and the Mercer County Regional Council of Governments (MCRCOG), which oversees the county's transit services—Shenango Valley Shuttle Service (SVSS) and Mercer County Community Transit (MCCT)—approved performance measures and performance targets for several topic areas:

Performance Measure Addressing...	Also Known As...
Safety	PM-1
Pavement Condition*	PM-2
Bridge Condition*	PM-2
System Performance*	PM-3
Transit Asset Management	TAM
Public Transit Safety	Transit Safety

** - Currently this PM only applies to National Highway System (NHS) Routes. Mercer County's NHS Routes include Interstates 79, 80 and 376; portions of US Routes 62/Business Route 62 and all of US Route 322; and portions of State Routes 18 and 58.*

PennDOT, the SVATS MPO, and the MCRCOG are required to jointly agree on written provisions for how information will be cooperatively developed and shared related to the selection of performance targets and the collection and reporting of data to track progress in meeting critical outcomes. Two steps were taken to meet this requirement: (1.) In November 2018, the SVATS MPO entered into an agreement acknowledging cooperative development and sharing of public transportation performance data with MCRCOG, on behalf of the Mercer County transit agencies, SVSS and MCCT. (2.) In May 2019, the SVATS MPO approved written data collection and sharing provisions with PennDOT for the safety, pavement, bridge and transportation system performance topic areas (PM1, PM2, and PM3).

The sections on the following pages describe each of these performance measures and how the MPO is specifically contributing toward meeting them.

Safety Performance Measures (PM1)

The FHWA rules 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. These rules established five safety performance measures (commonly known as PM1). (The current regulations can be found at 23 CFR 490 Subpart B and 23 CFR 924). Targets for the safety measures are established on an annual basis.

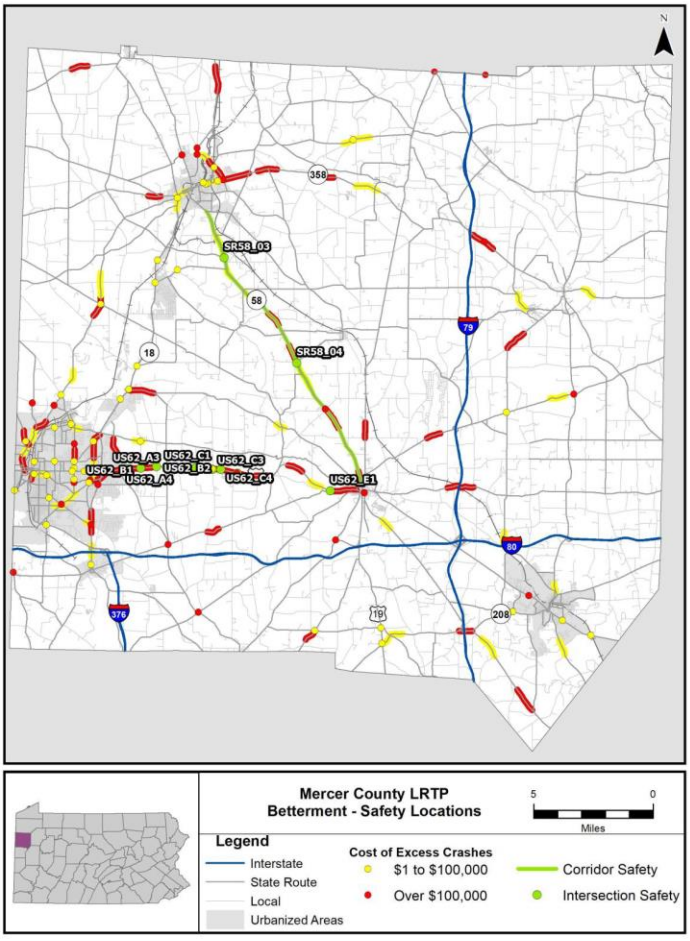
PennDOT developed methodology on establishing the State's safety targets and provided the SVATS MPO with existing baseline data and regional (Mercer County) targets. The targets listed on the following page's table are based on a 2% annual reduction for fatalities, and maintaining levels for suspected serious injuries. These targets were 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. The SVATS MPO received these most recent targets in the fall of 2021 and agreed—as they have in past years—to contribute toward the accomplishment of statewide targets at their November 2021 Coordinating Committee meeting.

If the outcome of at least four out of five performance measures is better than the baseline number, a state is determined to have met or made significant progress toward meeting established targets. 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. Since the SVATS MPO (and other MPOs/RPOs) are individually doing their part to reach the statewide goal, PennDOT continues to provide feedback on statewide and regionally-specific progress towards target achievement. The progress helps regional the SVATS MPO and PennDOT District 1-0 understand the impacts of their past safety investments and can guide future planning goals and strategy assessments.

Safety Performance Measure	Statewide Baseline (2016-2020)	Statewide Target (2018-2022)	SVATS MPO Baseline (2016-2020)	SVATS MPO Target (2018-2022)
Number of fatalities	1,140.6	1,113.7	13.0	13.0
Rate of fatalities per 100 million VMT	1.157	1.205	1.1	1.152
Number of serious injuries	4,445.6	4.490.8	47.6	39.6
Rate of serious injuries per 100 million VMT	4.510	4.860	4.026	3.509
Number of non-motorized fatalities and serious injuries	761.2	730.1	6.6	5.6

Safety is the Number-One driver of project selection at the MPO. This is evidenced by the MPO's LRTP Project Prioritization Criteria, various corridor safety studies (many of which were direct LRTP recommendations), and through increasingly close and detailed collaboration of the allocation of Highway Safety Improvement Program (HSIP) dollars with PennDOT District 1-0's Traffic Safety staff. MPO staff continues to advocate for HSIP dollars spread around to various lower-cost but high-impact projects and has continued to work with the district to take a more targeted approach to programming safety projects. A major component of this is utilization of PennDOT's Network Screening Tool, which is something District 1's Traffic Unit utilizes as we look at potential safety projects. Further, during the recent LRTP update, all locations across Mercer County were investigated through the Network Screening Tool in order to evaluate excess crash costs; those greater than zero and, especially, those over $100,000 were cataloged so we can more easily get a sense of potential locations to target HSIP improvements (as noted in the graphic to the right). Crash data (including the type and frequency of crashes) and the cost-benefit ratio of anticipated safety improvements are discussed between the MPO and the District; and programming-level decisions are made as a direct result of these conversations.



The programming of safety projects is a process that has evolved significantly over the years, and is expected to become more targeted as the process continues to evolve. MPO staff have committed to working even more closely with the district so that we can continue to get the most impact for our limited HSIP funding. Efforts should continue to be made to avoid the situation of simply programming HSIP funds toward a TIP project that happens to qualify for HSIP. Instead, a much more robust process closely evaluates the candidate projects from the LRTP and other known priorities

The SVATS MPO will receive an average allocation of $1.16m in HSIP annually over the next four years. Prior to IIJA's/BIL's passage, this amount was projected to be $962,000 per year. Even though this increase is somewhat modest and isn't nearly enough to cover safety issues, IIJA's/BIL's infusion adds just over $800,000 to the TIP over the four-year horizon—nearly a year's worth of funding under the old formula.

The 2023-2026 TIP proposes to split HSIP funding four ways: toward three specific projects and the rest remaining in the HSIP Line-Item. The thought behind leaving Years' Three and Four HSIP allocations in a budget line item is that gives planners and programmers a chance to get a more comprehensive understanding of potential projects and how they might qualify. As we all seek to get more creative and utilize the many tools at our disposal, we can make more-informed decisions on how we target HSIP.

MPMS #	***Project***	***Description and Location***	***4 Yr. TIP Cost***
111157	SR 518/SR 3025 Intersection	Addition of turning lanes and signal improvements to Sharpsville Borough's only signalized intersection	$750,000
110234	SR 18/SR 4006 Intersection	Realignment of slightly-skewed intersection and visibility improvements approximately two miles north of Greenville	$800,000
117671	US 62 and Neshannock Intersection	Addition of EB and WB turning lanes, minor widening of shoulder backup lanes, and minor sight-distance improvements (removal of cut slope) to increase intersection's conspicuity in the City of Hermitage.	$870,000 ($740,000 HSIP)
106423	HSIP Highway/Bridge Line Item	Money for additional HSIP Projects to be determined at a later date	$2,487,000

Recent discussions have focused on setting a significant portion of the remaining line item funding as well as any future HSIP Set-Aside that we may receive toward a host of qualifying improvements along the US 62 corridor between Hermitage and Mercer, as well as the PA 58 corridor between Greenville and Mercer. Safety-based corridor studies were recently completed along both of these corridors and several discussions with PennDOT District 1-0 have transpired over the past two-plus years regarding our collective top priorities. The MPO is also wrapping up a corridor safety study along US-19 in the Leesburg section of Springfield Township, so this location will also be a focus of potential projects.

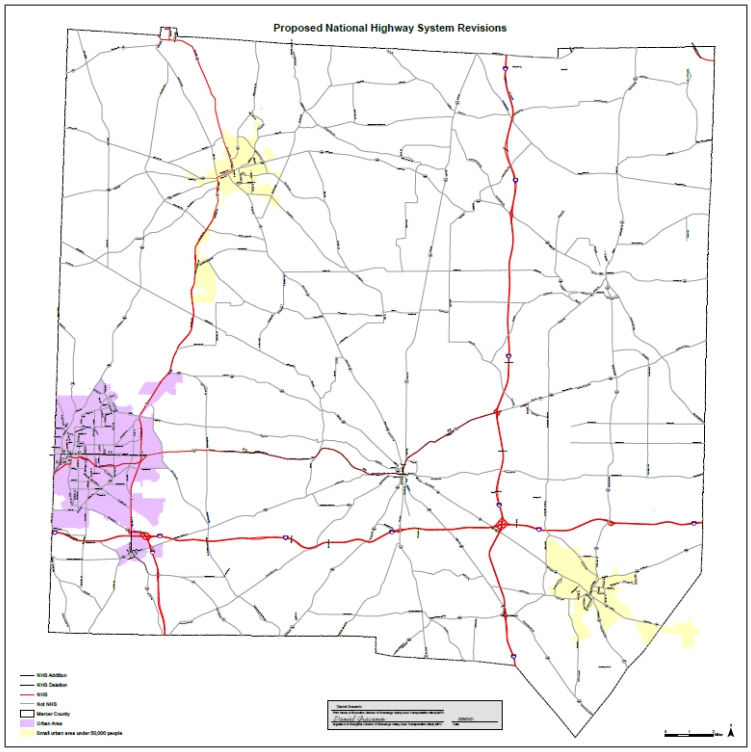
As noted above, HSIP cannot possibly fund all safety issues that exist across the county. Although PennDOT District 1 has done an admirable job of eliminating or improving so many of the most dangerous locations over the years, there still are areas of concern. Therefore, the MPO will continue to advocate for a fair consideration of safety in overall project selection, and the prioritization of safety improvements beyond what HSIP will allow. **To better illustrate this, consider that the TIP's four-year HSIP allocation ($4.651m) is 6.46% of the overall TIP's four-year allocation ($71.96m). With safety as our documented top priority, does it make sense to only program 6 or 7% of our TIP toward improving safety?** To at least partially answer this question, there are actually several other, non-HSIP-funded projects on the TIP are likely to have measurable safety benefits. Admittedly this is often harder to quantify and can get a bit subjective in determining which components of a project are safety related. However, the projects listed below are some of the more notable examples of *non*-HSIP projects that still will likely yield safety improvements:

MPMS #	*Project*	*Description and Location*	*4 Yr. TIP Cost*
110764	SR 18/SR 4005 Intersection	Signal and intersection improvements at two closely-spaced signals in Greenville	$650,000
109773	PA 18: SR 358 to Mill Hill Road	Roadway betterment project in Greenville: pavement, stormwater, ADA compliant elements, sidewalks, etc., including redesign of the main intersection (College and Packard) to allow for safer pedestrian crossing	$2,900,000
109340	US 62 Bessemer and Lake Erie Railroad Tunnel	Replacement of existing tunnel in Coolspring Township and significant geometric improvements and intersection redesigns on each approach to the tunnel so as to improve safety and provide greater efficiency for travelers	$200,000 (Additional funding needed; TIP funding only covers early engineering work)
116641	I-79 Mercer County ITS Addition at Grove City	Dynamic message signs near the I-79/SR 208 Interchange in Springfield Twp. (TSMO funded w/ TIP match; from D 1-0's Regional Operations Plan)	$318,500
98388	SR 3020: SR 18 to SR 3011	Full reconstruction of roadway, grade/sight distance improvements, and sidewalk construction along Lamor Road in vicinity of Hermitage's Joy Cone factory to improve freight safety and access	$2,350,000 (Municipality/Joy Cone awarded state DCED funds as well)

One new and very notable feature of the 2023-2026 TIP is the addition of a state-funded safety line item used to supplement the MPO's federal HSIP allocation (MPMS # 90401). This funding—programmed at $250,000 annually—can be utilized toward safety-focused projects that may or may not qualify for HSIP.

Pavement/Bridge Performance Measures (PM2)

The PM2 measures apply to both pavement and bridge condition. Both, however, are only applicable to the National Highway System (NHS). In other words, the performance of all other state and local routes are not considered as part of this analysis. As shown in the graphic to the right, Mercer County's NHS Routes (red lines on the map) include Interstates 79, 80 and 376; portions of US Routes 62/Business Route 62 and all of US Route 322; and portions of State Routes 18 and 58. Mercer County's NHS Network was recently (2021) reviewed and some changes were made to better-reflect the current functions of the network. Notably, US 62's NHS mileage increased significantly while Business Route 62 (State Street) and a small portion of SR 18 (south of I-80) were removed from the NHS because they duplicated nearby parallel NHS routes, and therefore were considered functionally redundant.



Pavement

Federal regulations require that no more than 5 percent of Pennsylvania's NHS Interstate lane miles be in Poor pavement condition. If that requirement is not met, restrictions are placed on how PennDOT can allocate federal NHPP and Surface Transportation Program (STP) funds. PennDOT's targets for NHS Interstate roadways reflect the federal regulation: no more than 5 percent of Pennsylvania's NHS Interstate pavements shall be rated in poor condition. Although FHWA has not established a minimum condition for NHS non-Interstate roadways, PennDOT has established performance targets for the non-Interstate NHS roadways.

Pavement performance measures require reporting on the following 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 a composite score of Good, Fair, or Poor. The tables below show the percentage of lane miles in both poor and good condition (baseline), as well as PennDOT's Statewide Pavement Performance Targets. These targets were formally supported by the SVATS MPO in November of 2018:

Interstate Routes			
Measure	**2017—Baseline**	**2019—2-Year Target**	**2021—4-Year Target & 2023—4 Year Target**
% in Good Condition	67.2%	N/A	60.0%
% in Poor Condition	0.4%	N/A	2.0%

NHS Non-Interstate Routes			
Measure	**2017—Baseline**	**2019—2-Year Target**	**2021—4-Year Target**
% in Good Condition	36.8%	35.0%	33.0%
% in Poor Condition	2.3%	4.0%	5.0%

Four-year targets remained the same in 2021 and 2023. New statewide targets for 2025 will be collaboratively established prior to October 2022. The targets will be consistent with PennDOT's asset management objectives of maintaining the system at the desired state of good repair, managing roadways to the lowest life-cycle cost (LLC), and achieving national and state transportation goals. 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.

SVATS MPO's 2023-2026 TIP contains four paving projects along the NHS network, plus one safety improvement project that will involve pavement (the aforementioned US 62/Neshannock intersection improvement). Together, these projects constitute a more than $10m investment toward improving deteriorating pavement conditions along NHS (Non-Interstate) routes. These five projects are shown on the following page:

MPMS #	*Project*	*Description and Location*	*4 Yr. TIP Cost*
109773	SR 18 from SR 358 to Mill Hill Road	3R Restoration/rehabilitation including paving and base repair, drainage, ADA improvements, intersection improvements, etc. in Town of Greenville	$2,900,000
114012	US 322: All Mercer County Sections	3R Restoration/rehabilitation including paving and base repair, drainage, ADA improvements, etc. in Jamestown Borough area and NE corner of Mercer County (two sections)	$2,000,000
114013	SR 18 from SR 358 to Divided Hwy	Pavement resurfacing/rehabilitation project in Greenville and West Salem Township to the south	$2,000,000
97912	US 62: Ohio Line to E. Budd Street	Pavement resurfacing/rehabilitation project in the City of Sharon's far western portion	$2,300,000
117671	US 62 and Neshannock Intersection	Addition of EB and WB turning lanes, minor widening of shoulder backup lanes, and minor sight-distance improvements (removal of cut slope) to increase intersection's conspicuity in the City of Hermitage	$870,000

Between the current TIP's levels of investment and previous recent investments, Mercer County's NHS pavement conditions are among the best in the Commonwealth. According to the 2020 PM Annual Performance Report for Pavements, Mercer County did not have any Interstate mileage in poor condition, and only 0.6 miles of non-Interstate NHS mileage in poor condition.

Finally, while not part of the regional (SVATS) TIP (but rather the Interstate Management TIP) a significant investment is being made along Interstate 80 from the Ohio-PA State Line to—eventually—Mile Marker (MM) 15 (US 19/Mercer Exit). This project is broken into three phases: MM 0-5, MM 6-10 and MM 11-15, with work starting at the westernmost section (MM 0-5), and moving eastward. The first phase, much of the second phase, and a small amount of the third phase will be funded during the FY 2023-2026 timeframe in the amount of over $83m, an incredibly significant amount of funding for this region (I-80 alone will see more total investment than Mercer County's entire Regional TIP allocation during this same time period!). Additionally, $500,000 will be funded toward improvements along I-79. This is a local reflection of Pennsylvania's commitment to increased Interstate maintenance, based on the 2023-2026 TIP Financial Guidance.

Bridges

The FHWA final rulemaking also established performance measures for all mainline Interstate Highway System and non-Interstate NHS bridges 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 (value of 7-9), fair (5-6), or poor (0-4) condition score rating.

A structure's overall condition rating is determined by the lowest rating of its deck, superstructure, substructure, and/or culvert. If any of the components of a structure qualify as poor, the structure is rated as poor. 23 CFR 490.411(a) requires that no more than 10 percent of a state's total NHS bridges by deck area are in poor condition. PennDOT BOMO and Engineering Districts utilize its bridge asset management tools and processes, which continue to be systematically expanded to analyze Pennsylvania's bridges. As was done with pavement condition, statewide performance targets (as shown below) were formally supported by the SVATS MPO in November of 2018:

Bridge Measures			
Measure	**2017—Baseline**	**2019—2-Year Target**	**2021—4-Year Target & 2023—4 Year Target**
% in Good Condition	25.6%	25.8%	26.0%
% in Poor Condition	5.5%	5.6%	6.0%

In Mercer County's 2018 Bridge Performance Report, there was not a single structure on the NHS found to be in Poor condition. Demonstrating PennDOT's proactiveness in programming bridge improvements along NHS routes before they become poor, the 2023-2026 TIP includes over $2.5m of investment into five structures, all of which are along US 62:

MPMS #	***Project***	***Description and Location***	***4 Yr. TIP Cost***
88486	US 62 Bridge over Spring Creek	Rehabilitation of the bridge over Spring Creek in Coolspring Township	$175,000 (Construction funding post-26)
109340	US 62 Bessemer and Lake Erie Railroad Tunnel	Replacement of existing tunnel and significant geometric improvements and intersection redesigns on each approach to the tunnel so as to improve safety and provide greater efficiency for travelers	$200,000 (Additional funding needed; TIP funding only covers some PE).
58052	US 62 Bridge over I-79	Replacement of the 4-lane bridge over I-79 in Jackson Township (Exit 121)	$2,000,000
97306	US 62 Bridge over Lackawannock Creek	Rehabilitation of the bridge over Lackawannock Creek in East Lackawannock Township	$100,000 (Construction funding post-26)
97327	US 62 over a Shenango River Tributary	Rehabilitation of the bridge over an unnamed tributary of the Shenango River in the City of Hermitage	$100,000 (Construction funding post-26)

In addition, rehabilitation of the large Interstate 80 bridge over the Shenango River is part of the aforementioned I-80 project from MM 0-5. This itself represents significant additional investment in NHS bridge deck area.

System Performance Measures—(PM3)

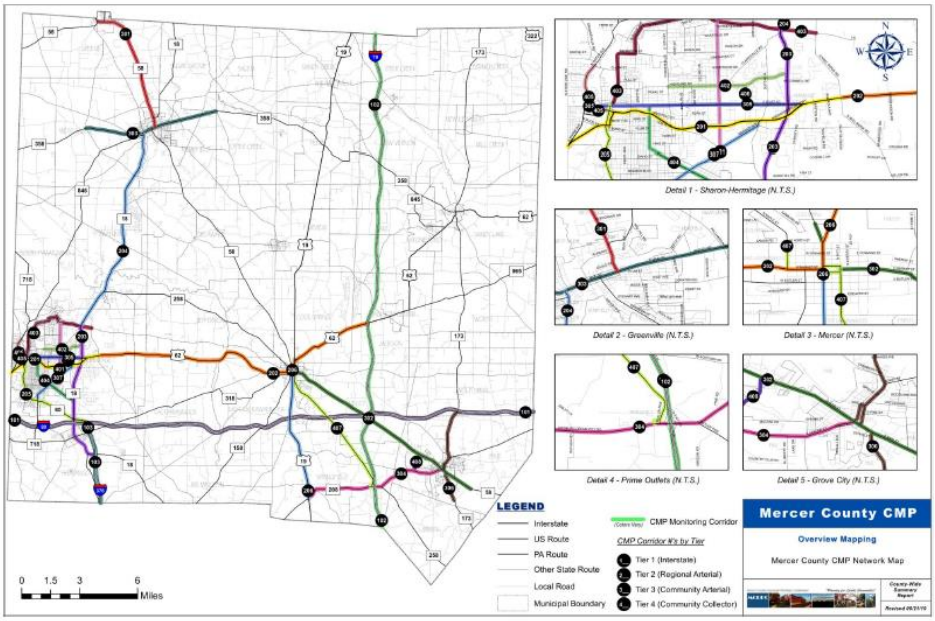
As with the PM2 measures above, The system performance measures apply only to roadways on the NHS. PennDOT identified and evaluated data and tools used to produce the baseline PM 3 performance measures. The University of Maryland CATT Lab's Regional Integrated Transportation Information System (RITIS) software platform is used to generate all the travel time based measures. Because there is limited historic information, and there is a need for additional research understanding the variances and factors influencing each of the travel time performance measures, PennDOT established conservative travel time performance targets, or benchmarks. PennDOT has been tracking the measures since 2018. States are permitted to adjust their 4-year targets at the midterm of the performance period, representing data through 2019 in a report which was due to FHWA in 2020. Therefore. a revision to Mercer County's targets was adopted by the SVATS MPO in early 2021. Specific PM3 performance measures for the SVATS MPO to meet 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
- Truck Travel Time Reliability Index – Interstate System Only

PennDOT's most recent targets, which were formally supported by the SVATS MPO in February 2021, are illustrated in the table below:

Travel Time Targets				
Measure	**2017—Baseline**	**2019—2-Yr. Target**	**2021—4-Yr. Target**	**2023—4 Yr. Target**
Interstate Reliability	89.8 %	89.8 %	89.8 %	89.5%
Non-Interstate NHS Reliability	87.4 %	N/A	87.4 %	87.4%
Truck Reliability Index	1.34	1.34	1.34	1.40%

Because Mercer County and the SVATS MPO are part of a Transportation Management Area (TMA) due to its inclusion within the Youngstown-Warren-Boardman, OH-PA Metropolitan Statistical Area, the SVATS MPO is required to monitor congestion through their Congestion Management Process (CMP). The most recent update is occurring as this TIP process wraps up (spring 2022). However, the prior update, which took place in 2018, included travel time runs as in years past. New to the 2018 CMP update (and continuing with the 2022 update) was the incorporation of INRIX speed and travel time database information, which taps into the concept of using Big Data resources as an alternative to gathering field-level measurements for each corridor. This data was analyzed through the aforementioned RITIS platform.



Nearly all of the NHS routes in Mercer County—including all Interstate Routes and all Other NHS routes except for US 322—are also CMP corridors in Mercer County (see list below for list of NHS corridors on CMP; see map to the right for all CMP corridors). And while the INRIX data was not available for all corridors within the CMP, it was available for all of Mercer County's CMP corridors on the NHS. Having this longer-term data available in addition to recent and historical travel time runs gave the county a relatively comprehensive snapshot of the overall reliability of corridors.

NHS Route Corridors on the Mercer County CMP	
I-80 (#101)	PA 18-Urban (#203)
I-79 (#102)	PA 18-Rural (#204)
I-376 (#103)	PA 58 (#302)
US 62-Urban (#201)	SR 3008 (aka Business U.S Route 62) (#305)

Significant detail of each of these (and other) corridors' delay and overall reliability can be found within the Mercer County CMP's *2018 Countywide Summary Report*. This report can be found on the MCRPC's

CMP website at https://mcrpc.com/transportation/congestion-management/. While it's difficult to condense the findings of an entire analysis and report into a few paragraphs, the 2018 CMP showed that all corridors—and including the NHS routes analyzed here—to be overall relatively reliable from a delay and travel reliability perspective. In fact, of the seven NHS Routes analyzed in the 2018 CMP, only one route indicated a general degradation from previous CMP analyses, based on an increase in buffer index (a still relatively minor 7%). This is shown in the CMP's Exhibit 4, copied below:

Travel Time, Delay, and Reliability Trends

Exhibit 4 from 2018 Countywide Summary Report—Mercer County Congestion Management Processes

CMP Corridor / Location / Description					CMP Data for Last Available Update							CMP Data for Current (2018) Update							CMP Trend Summary			
#	Route	Primary Area	Length (mi)	Source (Note 1)	Data Year	Travel Time (min)		Delay (min)		Buffer Index (%)		Data Year	Travel Time (min)		Delay (min)		Buffer Index (%)		Annual Change in Delay (min)		Annual Change in Buffer Index (%)	
						AM	PM	AM	PM	AM	PM		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
101	I-80	Countywide	27.8	***	2016	27.4	31.4	0.7	4.7	7%	44%	2018	26.4	26.5	-0.2	0.1	2%	17%	*-0.5*	*-2.3*	*-3%*	*-14%*
102	I-79	Countywide	26.1	***	2016	24.1	24.0	-0.2	-0.3	3%	3%	2018	23.8	23.6	-0.5	-0.6	1%	2%	*-0.2*	*-0.2*	*-1%*	*-1%*
103	I-376	South of I-80 to Lawrence Co.	4.3	***	2016	5.7	5.6	-0.1	-0.1	5%	6%	2018	5.6	5.7	0.0	-0.1	15%	10%	0.1	*0.0*	5%	2%
201	US 62 (Urban)	Sharon & Hermitage	5.2	***	2016	13.4	14.4	0.6	1.3	32%	60%	2018	13.6	15.4	0.3	2.0	33%	57%	*-0.2*	0.4	1%	*-2%*
202	US 62 (Rural)	Hermitage to Jackson Twp	15.7	***	2016	21.8	22.2	0.4	0.6	11%	15%	2018	23.6	22.7	1.6	1.1	22%	28%	**0.6**	0.3	**6%**	**7%**
203	PA 18 (Urban)	Hermitage	7.4	***	2016	17.0	17.6	1.2	1.7	35%	58%	2018	16.9	17.5	1.5	1.8	42%	49%	0.2	0.1	4%	*-5%*
204	PA 18	Hermitage to Greenville	10.9	***	2016	15.8	16.1	0.2	1.0	24%	47%	2018	16.1	16.3	0.8	0.9	38%	43%	0.3	*-0.1*	**7%**	*-2%*
205	PA 60 (PA 760)	North of I-80	5.6	*	2009	-	9.2	-	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-
206	US 19	Springfield Twp to Mercer	7.5	***	2016	10.5	11.2	0.3	0.7	18%	19%	2018	11.6	11.8	0.8	1.4	28%	43%	0.3	0.4	5%	**12%**
301	PA 58	Greenville to Jamestown	6.9	***	2016	16.2	16.1	0.9	0.8	20%	25%	2018	17.1	16.1	1.2	0.6	19%	15%	0.2	*-0.1*	*-1%*	*-5%*
302	PA 58	Mercer to Grove City	11.6	***	2016	28.4	28.5	0.6	0.8	12%	11%	2018	29.6	29.8	1.3	2.0	13%	17%	0.4	**0.6**	1%	3%
303	PA 358	Greenville	16.7	***	2016	29.1	30.0	0.6	1.1	9%	14%	2018	29.9	30.6	0.9	1.5	21%	24%	0.2	0.2	**6%**	5%
304	PA 208	Springfield Twp to Grove City	7.5	***	2016	16.6	16.8	0.4	0.8	12%	22%	2018	17.1	17.9	2.1	1.4	61%	45%	**0.9**	0.3	**25%**	**12%**
305	SR 3008 (E State St)	Sharon & Hermitage	3.6	***	2016	-	-	-	-	-	-	2018	13.4	14.2	0.9	2.0	18%	24%	-	-	-	-
306	PA 173	Grove City	5.1	***	2016	16.5	16.5	0.4	0.5	8%	10%	2018	19.0	17.8	2.1	1.4	40%	22%	**0.9**	0.5	**16%**	**6%**
307	PA 418	Wheatland to Hermitage	2.8	*	2009	-	6.3	-	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-
401	SR 3025 (Mercer & Buhl Farm)	Hermitage to Sharpsville	2.8	**	2013	-	7.3	-	3.2	-	-	2018	-	6.6	-	2.5	-	-	-	*-0.1*	-	-
402	SR 3014 (Highland)	Sharon & Hermitage	2.0	**	2013	-	5.6	-	2.5	-	-	2018	-	5.8	-	2.8	-	-	-	0.1	-	-
403	PA 518 & SR 3020 (Lamor)	Sharpsville	5.3	**	2013	-	12.4	-	4.3	-	-	2018	-	12.1	-	4.0	-	-	-	*-0.1*	-	-
404	PA 518 (Longview & Stambaugh)	Sharon & Hermitage	3.2	**	2013	-	7.5	-	2.6	-	-	2018	-	6.7	-	1.9	-	-	-	*-0.1*	-	-
405	PA 718 (Water & Connelly)	Sharon	1.4	*	2013	-	4.7	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-
406	N Kerrwood Dr	Hermitage	0.4	**	2013	-	1.5	-	0.6	-	-	2018	-	1.4	-	0.6	-	-	-	*0.0*	-	-
407	PA 258	Prime Outlets to Mercer	8.1	*	2009	-	12.7	-	3.1	-	-	-	-	-	-	-	-	-	-	-	-	-
408	George Jr Rd	Grove City	1.0	*	2009	-	1.9	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-

Table Note 1:

(*) one-star data derived from the initial 2009 GPS-based travel time runs for the weekday PM peak period only; no subsequent updates or comparison data available at this time.
(**) two-star data and comparisons derived from 2013 and 2018 GPS-based travel time runs for the weekday PM peak period only.
(***) three-star data and comparisons derived from 2016 and 2018 INRIX-based data for the weekday AM and PM peak periods.

Table Note 2:

CMP Trend Summary data in *green italic text* indicate a general improvement based a reduction in annual delay (implying less delay) and/or a reduction in buffer index (implying more reliable or predictable travel)
CMP Trend Summary data in **red bold text** indicate a general degradation based on an increase in annual delay (> 30 seconds) and/or an increase in buffer index (> 5%)

Among the multiple performance measures reviewed by the initial Mercer County CMP in 2009-2010, Total Delay (measured in vehicle-hours for the PM peak period) was referenced as a primary factor. Although perhaps a tangent to the required PBPP documentation here, this still assists in understanding congestion (and system performance) in Mercer County more holistically. Total Delay balances a review of the measured travel delay alongside the estimated volume of traffic experiencing that delay. To provide similar perspectives and related corridor rankings, subsequent updates (including the 2018 update) incorporated a review of Total Delay for every corridor on the existing CMP network. The calculation methods for updating this measure varied depending on the delay data source (as depicted by the one, two, or three-star data notes in the 2018 CMP's Exhibit 5 chart on the following page); therefore, while generally valid for order-of-magnitude perspectives, direct comparisons of Total Delay or rankings across different sources should be used with caution. Traffic volumes for all corridors were consistently updated to 2018 based on the latest available traffic volume data reported by PennDOT's online Traffic Information Repository (TIRe) system. A few notable (i.e. pertinent to NHS routes) summary perspectives based on Total Delay comparisons in the 2018 CMP's Exhibit 5 include the following:

• Consistent with previous CMP updates, Corridor #305 (SR 3008/Business Route US 62 E State St) had the highest level of Total Delay (85 vehicle-hours) of all corridors during the weekday PM peak. However, this entire corridor recently (2019) saw significant investment through three major (previous) TIP projects, including many signal improvements. What effect any signal improvements may have had on the overall delay remain to be seen in the 2022 CMP update.
• Five corridors yielded Total Delay of 20-30 vehicle-hours, including two (both on the NHS) that are also ranked as having the most variable (i.e. least reliable) travel conditions on the network, specifically along Corridor #201 (US 62, urban) and #203 (PA 18, urban).
• All three major interstates in Mercer County yielded less than 10 vehicle-hours of delay during the weekday PM peak.

PM Peak Period Total Delay Rankings

Exhibit 5 from 2018 Countywide Summary Report—Mercer County Congestion Management Processes

CMP Corridor			PM Peak Period Total Delay		Estimated Traffic Volume	PM Peak Period Average Delay	PM Peak Period Travel Time Reliability	
#	Route	Source	Rank by Corridor	Vehicle-Hours of Delay	Vehicles per Day	Minutes	Rank by Corridor	% Buffer Index
305	SR 3008 (E State St)	***	1	85	4,300 - 14,900	2.0	7	24%
403	PA 518 & SR 3020 (Lamor)	**	2	35	2,500 - 9,600	4.0	-	-
401	SR 3025 (Mercer & Buhl Farm)	**	3	33	5,700 - 11,400	2.5	-	-
402	SR 3014 (Highland)	**	4	31	5,800 - 11,200	2.8	-	-
201	US 62 (Urban)	***	5	28	10,000 - 15,200	2.0	1	57%
203	PA 18 (Urban)	***	6	26	3,200 - 20,500	1.8	2	49%
302	PA 58	***	6	26	4,800 - 16,300	2.0	10	17%
404	PA 518 (Longview & Stambaugh)	**	6	26	6,000 - 9,600	1.9	-	-
205	PA 60 (PA 760)	*	9	22	4,300 - 15,900	1.7	-	-
303	PA 358	***	10	20	3,100 - 11,200	1.5	7	24%
307	PA 418	*	11	16	2,900 - 8,400	2.2	-	-
405	PA 718 (Water & Connelly)	*	12	14	3,300 - 6,400	2.0	-	-
407	PA 258	*	12	14	2,300 - 7,100	3.1	-	-
202	US 62 (Rural)	***	14	13	3,500 - 9,300	1.1	6	28%
306	PA 173	***	15	12	3,200 - 8,200	1.4	9	22%
204	PA 18	***	16	10	12,000 - 14,000	0.9	4	43%
206	US 19	***	17	9	2,100 - 9,300	1.4	4	43%
101	I-80	***	18	8	26,300 - 30,500	0.1	10	17%
304	PA 208	***	19	7	6,100 - 12,100	1.4	3	45%
301	PA 58	***	20	5	2,400 - 3,900	0.6	12	15%
406	N Kerrwood Dr	**	21	3	9,500	0.6	-	-
408	George Jr Rd	*	22	2	4,400 - 4,900	0.3	-	-
103	I-376	***	23	1	13,600 - 14,700	0.0	13	10%
102	I-79	***	24	0	15,100 - 23,700	0.0	14	2%

Table Note 1:
(*) one-star data approximates total delay using 2009 GPS-based measurements x 2018 traffic volumes for the corresponding travel segment.
(**) two-star data approximates total delay using 2018 GPS-based measurements x 2018 traffic volumes for the corresponding travel segment.
(***) three-star data approximates total delay using 2018 INRIX averages by INRIX segment x 2018 traffic volumes for the nearest comparable travel segment.

While it is extremely important to note that the methods used for the CMP and PM3 data collection are not *quite* an apples-to-apples comparison, this does provide a general snapshot of the overall congestion picture in Mercer County. More importantly, it demonstrates Mercer County's somewhat minimal overall congestion, relative to many other regions.

Still, travel time can always be improved through various interventions. On Mercer County's 2023-2026 TIP, a few projects along NHS routes are likely to positively affect system reliability. These are shown on the table below:

MPMS #	*Project*	*Description and Location*	*TIP Cost*
109773	SR 18 from SR 358 to Mill Hill Road	Intersection improvements as part of larger 3R Betterment project in Town of Greenville*	$2,900,000
116641	I-79 Mercer County ITS Addition at Grove City	Dynamic message signs near the I-79/SR 208 Interchange in Springfield Twp. (TSMO funded w/ TIP match; from D 1-0's Regional Operations Plan)**	$318,500
117671	US 62 and Neshannock Intersection	Addition of EB and WB turning lanes, minor widening of shoulder backup lanes, and minor sight-distance improvements (removal of cut slope) to increase intersection's conspicuity in the City of Hermitage.	$870,000 ($740,000 HSIP)
110764	SR 18/SR 4005 Intersection	Signal and intersection improvements at two closely-spaced signals in Greenville	$650,000

* Part of this project includes a redesigned intersection of these two routes. This intersection (specifically) is proposed to be partially-funded ($1,000,000) through the MPO's STU funding source through a competitive, MPO-allocated process, with the remainder coming from state 581 funds. The primary impetus for this project related to safety for pedestrians (as it is adjacent to a college), but modest operational benefits are likely to be realized.

**Mercer County was also successful in receiving dedicated TSMO Spike through the competitive TSMO funding initiative. Two separate projects along I-80 will make various ITS improvements such as dynamic message boards and cameras.

One project programmed along NHS routes through previous (recent) TIPs—the US 62 roundabout project—is also likely to yield significant improvements to travel time reliability.

In addition to travel reliability, and in accordance with 23 U.S.C. 149(l), some regions within Pennsylvania must also develop a performance plan related to congestion mitigation and air quality (CMAQ) improvements. This applies only to MPOs serving a Transportation Management Area (TMA) with a population over 1 million representing nonattainment and maintenance areas for air quality. These MPOs must update these CMAQ Performance Plans biennially to report baseline condition/performance, targets, projects that will contribute to the targets, and the progress toward achievement of targets for the CMAQ traffic congestion and on-road mobile source emissions measures. Likewise, 23 CFR 490.105(f)(5)(iii) requires these MPOs must establish both 2-year and 4-year targets for the metropolitan planning area.

Although Mercer County is part of a TMA, it is well below the population threshold of 1 million. Therefore, the SVATS MPO is not required to develop a CMAQ Performance Plan. However, the previously-mentioned CMP can be used as a programming tool in Mercer County, as the MPO works with PennDOT District 1-0 to select projects that will have impactful improvements to the overall system in terms of overall congestion and, concomitantly, improved air quality.

Public Transit Asset Management Performance Measures—(TAM)

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 Mercer County Regional Council of Governments (MCRCOG) oversees Mercer County's transit agencies—The Shenango Valley Shuttle Service (SVSS) and Mercer County Community Transit (MCCT)—and these qualify into the Tier II category. 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 nearly all remaining Tier II systems in Pennsylvania, (including MCRCOG) elected to participate in the PennDOT Group Plan.

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

- Rolling Stock – Percentage past the Useful Life Benchmark (ULB) (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. Current performance targets are listed in the table on the following page.

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.

Performance Measure	Asset Class	FY 2020-21 Target	Current Performance	FY 2021-22 Target
Rolling Stock (Revenue Vehicles)				
Age - % of revenue vehicles within a particular asset class that have met or exceeded their Estimated Service Life (ESL)	AO-Automobile	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)				
Age - % of non-revenue/service vehicles within a particular class that have met/exceeded their ESL	Automobiles	46%	57%	57%
	Other Rubber Tire Vehicles	50%	22%	22%
Facilities				
Condition - % of facilities with a condition rating below 3.0 on the FTA TERM scale	Administrative/Maintenance Facilities	30%	14%	14%
	Passenger/Parking Facilities	83%	84%	84%

On the 2023-2026 TIP, several projects from the Public Transit portion of the TIP work toward meeting the performance targets listed above. In total, the four-year funding for asset management-related expenses totals over $3.2m, with about half of the total going toward actual revenue vehicles:

MPMS #	*Project*	*Description*	*4-Yr TIP Cost*
83653	Asset Maintenance Expenses	Section 5307 funds to maintain transit assets	$900,000
83656	Shop/Garage Equipment	Purchase of shop and garage equipment deemed necessary to the efficient operation of the maintenance system	$160,000
83658	Office Equipment	Upgrade of the office equipment and computers at the SVSS facilities	$45,000
95413	Office and Garage Improvements	Interior and exterior office and garage improvements: painting, paving, landscaping, doors, cement pad	$432,000
102638	Vehicle Purchase	Purchasing of fixed route buses	$1,254,000
111059	Small Transit Buses	Purchasing of shared-ride/paratransit buses	$360,000
118142	Replace Service Vehicle	Project to replace service vehicle for SVSS	$100,000

Public Transit Safety Performance Measures—(Transit Safety)

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
4. System Reliability

Mercer County's Transit Agencies (SVSS and MCCT), as with all public transit agencies in the Commonwealth, have written an Agency Safety Plan (ASP) compliant with Part 673 as of July 20, 2021. The ASM 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.

Current SVSS/MCCT Transit Safety performance targets are as follows:

	Fatalities		Injuries		Safety Events		System Reliability
Transit Service Type	**Total Events**	**Rate***	**Total Events**	**Rate***	**Total Events**	**Rate***	**Miles Between Major Mechanical Failures**
Fixed-Route (SVSS)	0	0 per 100,000	1	1 per 100,000	1	1 per 100,000	9,800
Paratransit (MCCT)	0	0 per 100,000	1	1 per 100,000	1	1 per 100,000	60,000

* per vehicle revenue mile

The 2023-2026 TIP includes several projects (as noted in the TAM section) that help to maintain and/or purchase new rolling stock. These, of course, should help to improve system reliability. Having up-to-date shop equipment (also an aforementioned TIP project) will also assist in keeping the system's reliability in-check.

Safety events are a bit less predictable, and there are so many factors that can affect the local transit agencies' safety performance. Weather, the randomness of other drivers' actions, the defensiveness and practicing of safety for each driver, and many other factors can increase or decrease the risk of an accident. However, if past performance is any indicator, the drivers hired to operate SVSS's and MCCT's rolling stock are well-trained and safe drivers, and Mercer County Regional Council of Governments (MCRCOG) staff (which oversees the two transit systems) is committed to ensuring drivers have the proper training to keep the safety of transit riders a top priority.