

Appendix J: Transit Safety Performance Measure

Transit Safety Rule

The Public Transportation Agency Safety Plan (PTASP) regulation, at 49 C.F.R. Part 673, requires covered public transportation providers and state DOTs to establish safety performance targets (SPTs) to address the safety performance measures identified in the National Public Transportation Safety Plan (49 C.F.R. § 673.11(a)(3)). Transit agencies and states must identify SPTs by mode for each of the following categories:

- **Fatalities:** Total number of fatalities reported to the National Transit Database (NTD) and rate per total vehicle revenue miles (VRM) by mode.
- **Injuries:** Total number of injuries reported to NTD and rate per total VRM by mode.
- **Safety Events:** Total number of safety events reported to NTD and rate per total VRM by mode.
- **System Reliability:** Mean distance between major mechanical failures by mode.

Transit agencies are required to report their targets and performance to the state DOT and the agency's MPO in order to prioritize funding to improve transit safety performance.

Transit agencies are required to set their initial safety performance targets by July 20, 2020. 49 C.F.R. § 673.15(b) requires, to the maximum extent practicable, a state or transit agency to coordinate with states and MPOs in the selection of State and MPO safety performance targets; and in accordance with 49 U.S.C. 5303(h)(2)(B) and 5304(d)(2)(B), states and transit agencies must make their SPTs available to states and MPOs to aid in the planning process. MPOs are required to set performance targets for each performance measure, per 23 C.F.R. § 450.306; and these must be established 180 days after the transit agency establishes their performance targets. FTA will not impose penalties for failing to meet safety performance targets set by transit providers.

In the Pennsylvania TIP DVRPC is only required to list the SEPTA projects, as PATCO projects are listed in the New Jersey TIP. DVRPC coordinated with SEPTA on target setting during the summer and fall of 2020 and agreed to accept SEPTA Transit Safety Targets at the January 28, 2021 Board Meeting.

To help establish favorable trends for these SPTs SEPTA has developed and implemented, various safety programs, rules, and standard operating procedures. In addition to these administrative controls, SEPTA develops engineering controls or eliminates these risks by investing capital funds on various projects. The projects will be maintaining SEPTA's state of good repair and reduce risks, improve safety, and help achieve the SPTs goals. Under SEPTA's FY2022 Capital Program, SEPTA is committing \$50 million toward Communication and Signal System Improvements, \$52 million toward Infrastructure Safety Renewal Programs, \$18.49 million toward Safety and Security Improvements, \$159.72 million toward vehicle acquisition and overhauls, and \$ 31.9 million toward projects of significance early action phases for SEPTA's Bus Network Redesign, trolley modernization and vehicle acquisition projects. For specific details on each of the referenced programs/projects, refer to SEPTA's Capital Program Report.

Transit Safety Targets and Goals

Measure 1: Fatalities:

The transit safety performance measure requires that transit providers set annual targets for the number of fatalities that occur on each mode of transit that the agency operates, excluding deaths that result from trespassing, suicide, or natural causes. The National Public Transportation Safety Plan (NTPSP) defines the

modes as rail, fixed guideway bus service, and non-fixed route bus service. Fatalities are required to be calculated for both the total number of fatalities and the fatality rate per vehicle revenue mile.

Specific targets are set for:

- Total fatalities, by mode, across the transit agency's system.
- The rate of fatalities, by mode, per vehicle revenue mile operated by the transit agency.

Measure 2: Injuries:

The PTASP requires that transit agencies set annual targets for the number of injuries that occur on each mode of transit that the agency operates. Injuries are defined as "harm to person that requires immediate medical attention away from the scene." Injuries are required to be calculated for both the total number of injuries and the injury rate per vehicle revenue mile for each of the modes that the agency operates.

Specific targets are set for:

- Total injuries, by mode, across the transit agency's system.
- The rate of injuries, by mode, per vehicle revenue mile operated by the transit agency.

Measure 3: Safety Events:

Transit providers are required to set annual targets for the number and rate of safety events, by mode, that occur across the transit agency's system. A safety event is defined by FTA as a "collision, derailment, fire, hazardous material spill, or evacuation." Safety events are required to be calculated for both the total number of events and the event rate per vehicle revenue mile for each of the modes that the agency operates.

Specific targets are set for:

- Total safety events, by mode, across the transit agency's system.
- The rate of safety events, by mode, per vehicle revenue mile operated by the transit agency.

Measure 4: System Reliability:

Transit providers are required to set annual targets for the agency's system reliability for each mode of transit that the agency operates. The system reliability performance measure accounts for major mechanical failings of a vehicle that prevent the vehicle from starting or completing a scheduled trip. Mechanical failings and interrupted trips can create hazardous conditions for the transit operators and passengers depending on the location of the service interruption and if passengers are required to de-board in unsafe locations.

Specific targets are set for:

- The miles traveled between major mechanical failures calculated for each mode that the transit agency operates.

Coordination on Transit Safety Target Setting

MPOs have 180 days after the transit agencies set their targets, to decide to either adopt the transit operators' targets or develop their own metropolitan targets. DVRPC has taken formal action to adopt the same set of safety targets as SEPTA. DVRPC has also worked with SEPTA and the Pennsylvania Department of Transportation (PennDOT) to develop a set of written procedures that outline the coordination process for Transit Safety. SEPTA operates on a Fiscal Year of July 1 through June 30.

Table 1: Transit Safety Rule – Fatalities and Injuries

| Transit Safety Rule – Fatalities and Injuries (number/rate) | | | |
|--|-----------------------|-----------------------|-----------------------|
| NTD Category | FY 2020 Target | FY 2020 Actual | FY 2021 Target |
| SEPTA Fatalities per 100,000 miles | | | |
| Fatalities | - | 0.0175 | -- / 0.0173** |
| SEPTA Passenger Injuries per 100,000 miles | | | |
| Bus | -- / 5.90 | -- / 5.23 | -- / 5.53** |
| Trolley Bus | -- / 4.72 | -- / 6.74 | -- / 5.75** |
| Heavy Rail (MFL) | -- / 0.93 | -- / 0.71 | -- / 0.79** |
| Heavy Rail (BSL) | -- / 0.41 | -- / 0.38 | -- / 0.40** |
| Heavy Rail (NHSL) | -- / 4.16 | -- / 2.52 | -- / 3.48** |
| Light Rail | -- / 7.40 | -- / 6.10 | -- / 6.48** |
| Commuter Rail | -- / 0.59 | -- / 0.78 | -- / 0.69** |
| SEPTA Employee Injuries per 100,000 miles | | | |
| | -- / 3.51 | -- / 3.35 | -- / 3.28*** |

** : SEPTA has only submitted rates, not numbers, for their Fatalities and Injuries targets

Table 2: Transit Safety Rule – Safety Events

| Transit Safety Rule – Safety Events | | | |
|--|-----------------------|-----------------------|-----------------------|
| NTD Category | FY 2020 Target | FY 2020 Actual | FY 2021 Target |
| SEPTA Vehicle Accidents per 100,000 miles | | | |
| Bus | 8.87 | 7.59 | -- / 8.18** |
| Trolley Bus | 9.61 | 8.99 | -- / 9.51** |
| Heavy Rail (MFL) | 0.06 | 0.13 | -- / 0.09** |
| Heavy Rail (BSL) | 0.05 | 0.09 | -- / 0.07** |
| Heavy Rail (NHSL) | 1.21 | 2.19 | -- / 2.30** |
| Light Rail | 9.29 | 7.88 | -- / 8.38** |
| Commuter Rail | 0.07 | 0.08 | -- / 0.07** |
| SEPTA Station Accidents per 100,000 miles | | | |
| Heavy Rail (MFL) | 0.23 | 2.88 | -- / 1.59** |
| Heavy Rail (BSL) | 0.18 | 0.86 | -- / 0.56** |
| Heavy Rail (NHSL) | 3.04 | 0.81 | -- / 0.72** |
| Light Rail | 0.62 | 1.17 | -- / 1.01** |
| Commuter Rail | 0.86 | 0.88 | -- / 0.95** |
| SEPTA Safety Events | | | |
| Bus | 631 | 555 | 595 |
| Trolley Bus | 10 | 10 | 13 |
| Heavy Rail | 132 | 115 | 132 |
| Light Rail | 121 | 83 | 104 |
| Commuter Rail | 4 | 0 | 3 |

**SEPTA has only submitted rates, not numbers, for their Vehicle Accidents and Station Accidents targets

Progress Towards Transit Safety Targets

The Transit Safety Rule requires MPOs to describe how the region's Transportation Improvement Program (TIP) will help to achieve the Transit Safety targets. The DVRPC FY2021 TIP was not necessarily developed to ensure progress toward target achievement as the deadline for target setting was after DVRPC Board adoption of the TIP. However, transit safety, and safety in general, is an extremely high priority for all projects in the TIP as shown by Safety being the top criterion in the **Error! Reference source not found.** on page**Error! Bookmark not defined.** of the DVRPC FY2021 TIP for PA. Internally, SEPTA tracks these indicators on a Fiscal Year (FY) basis and publishes a monthly report evaluating performance against establish targets. Targets set by System Safety are calculated as an average of the previous two fiscal years (FY) reduced by 1%. FY21 runs from July 1, 2020 to June 30, 2021. SEPTA will collect the safety data and analyze it to be able to adjust the Transit Safety Targets and then share that information with DVRPC at the end of calendar year 2021. There should be enough data, at that time, to where SEPTA will be able to determine what progress is being made towards the Transit Safety Targets, with projects that will be programmed in the Draft FY2023 TIP. At that time, SEPTA will also provide DVRPC with total numbers as well as the rates for the Transit Safety Targets. Similar language for PATCO's transit projects in New Jersey will be shown in the New Jersey TIP.

Measure 1: Fatalities, Measure 2: Injuries, and Measure 3: Safety Events

To reduce the number of fatalities, injuries and safety events, SEPTA is implementing the following projects that will help reduce rail vehicle collisions, grade crossing events, trespassing, and Pedestrian safety in and around SEPTA's operating environments.

Stations, Loops and Parking Improvements (MPMS #77183 Transit & Regional Rail Station Program & MPMS# 90497 Infrastructure Safety Renewal Program) – The program provides for the construction, reconstruction or rehabilitation of transit and regional rail stations and terminals, bus/trolley loop facilities, transportation centers, bicycle facilities and parking expansions and improvement. In FY22 SEPTA is scheduled to progress the following projects.

- Ardmore Transportation Center
- Conshohocken Station & Parking
- 11th Street Station
- A Rail Transit Global Wayfinding and signage project
- Replacing and adding new ADA bridge plates for Regional rail and transit stations,
- Chestnut Hill East ADA improvements
- Swarthmore Station Design
- Willow Grove Station Phase 1
- Center City Concourse Phase 2 & 4.
- Somerset Station edge of platform safety rail pilot.

Due to reduced ridership resulting from the COVID-19 pandemic, SEPTA is re-evaluating its station, loops and parking needs and will finalize additional projects based on that evaluation.

Signal System Safety Renewal Program (MPMS #102571 Communications, Signals, & Technology Program) – SEPTA will be modernizing various signal systems throughout their system including a positive train control system on the Media Sharon Hill Line (MSHL), modernizing their Broad Street Line signal system, advancing a positive Train Control preliminary design for the Market Frankford Line, and reconfiguring interlockings on the Norristown High Speed Line (NHSL) to enhance train movement. These signal system enhancements will provide the improved technology to reduce if not eliminate train incidents due to overspeed, close separation and signal run-throughs.

Track and Right-of-Way Safety Renewal Program (MPMS #102565 Track Improvement Program) – This program focuses on the renewal and replacement of track switches and special work including yard and shop areas, track surfacing, culverts, bridges and retaining walls. In FY22 SEPTA will be working on the following sections of right-of-way.

- Market Frankford Line (MFL) Bridge St Yard
- NHSL Ties and CWR,
- Route 101/102 Yard Track,
- Route 101/102 – Hilltop Road
- Route 102 – Spruce Street (adding 2nd track)
- Route 102 – Broad Street (adding 2nd track)
- Route 102 – Walnut Street (adding 2nd track)

City Street track replacement at 41st & Filbert, Curve Renewal at 59th & Callowhill, Tangent Track renewal from Callowhill to Girard, Callowhill from 58th to 60th & Girard including curve. The street track will also include Route 15, Tangent Track Renewal on Girard Avenue from 26th to 33rd and from 34th to 38th

Regional Rail - Bishop Avenue

Elevator Escalator Improvements (MPMS #107011 Safety & Security Improvements) – SEPTA has programed to modernize and upgrade escalators and elevators throughout the system to maintain safe transport and ADA compliance for SEPTA’s customers. In FY22 SEPTA will be working on the design phase of the following units.

Replacement of five (5) escalators.

One escalator at each of the five (5) stations:

- Broad Street Subway (BSS) Olney Station
- BSS C.B. Moore Station
- BSS City Hall Station
- Market Frankford Subway Elevated (MFSE) Spring Garden Station
- MSFE 13th Street Station

Overhaul/Modernization of eight (8) elevators.

Two elevators at each of the four (4) stations.

- MFSE Tioga Station
- MFSE Girard Station
- MFSE Erie-Torresdale Station
- MFSE 69th Street Station

SEPTA is currently working (construction) on MFSE Allegheny elevators and finished MFSE Somerset elevators prior to that. The next, SEPTA in-house, elevator construction/rehab will be at MFSE Huntingdon Station.

SEPTA’s Grade Crossing Enhancement Program (MPMS #107011 Safety & Security Improvements) – This program incorporates upgrades to various grade crossings to help mitigate grade crossing events involving private over the road vehicles and pedestrians. In FY22 SEPTA will be completing quad gates at Ford Street on the Norristown Line and going out for bid for, Oak Street, Main St., 2nd, 3rd, Walnut and Beaver streets.

SEPTA is also submitting a grant that would allow for improvements at Bellevue and Woodbourne on the West Trenton line and Union Ave on the Media line.

Fern Rock Transportation Center Security upgrades (MPMS #107011 Safety & Security Improvements) – The work will address trespassing issues and security improvements around the Fern Rock Transportation Center. The work includes, a grade separated pedestrian cross over, platform repairs and elevator upgrades on the Railroad platform as well as security fencing, lighting, and CCTV upgrades to Fern Rock Subway rail yard.

System Wide Security - Through the U.S. Department of Homeland Security (DHS), the Transit Security Grant Program provides funds to operators of public transportation systems to protect critical surface transportation assets and the traveling public from acts of terrorism, and to increase the resilience of transit infrastructure. From this grant program, SEPTA has funded closed circuit television (CCTV) cameras on vehicles; multi-jurisdictional counter terrorism emergency simulation drills on various transit modes; directed SEPTA Transit Police Patrols in strategically designated areas during periods of elevated alert using specially trained anti-terrorism teams; hazardous material identification kits for Special Operations and Response Teams (SORT); purchase of explosive detection devices, intrusion detection and surveillance equipment, and bulletproof vests; Special Operations and Response Teams (SORT) and K-9 patrol teams; upgraded mobile communications and Control Center monitoring equipment; installation of video surveillance cameras at transit facilities; implementation of a radio interoperability system (RIOS); maintenance of a computer aided dispatch and records management system (CAD/RMS) for the Philadelphia region; and perimeter fencing and security cameras at SEPTA’s Fern Rock facility

Revenue Fleet Collision Avoidance Technology Pilots - Collision avoidance system technology is evolving and there are systems now available to the public transit industry that can help reduce the human factors component to vehicle accidents. SEPTA will be testing two separate collision avoidance systems. One pilot project will retrofit four (4) Light Rail trolleys with a collision avoidance system and one pilot project will retrofit two (2) buses. The results of these pilot programs will help SEPTA determine if the available technology is effective and reliable to pursue this technology on a fleet wide basis.

Table 3: Transit Safety Rule – System Reliability

| SEPTA System Reliability (Mean Distance in Miles between Major Service Failures) | | | |
|---|-----------------------|-----------------------|-----------------------|
| | FY 2020 Target | FY 2020 Actual | FY 2021 Target |
| SEPTA | | | |
| Heavy Rail (MFL) | 85,000 | 129,796 | 85,000 |
| Heavy Rail (BSL) | 130,000 | 145,757 | 130,000 |
| Heavy Rail (NHSL) | 35,000 | 35,129 | 35,000 |
| Light Rail (City) | 8,000 | 13,909 | 8,000 |
| Light Rail (MSHL) | 20,000 | 27,341 | 20,000 |
| Commuter Rail | 30,000 | 46,373 | 30,000 |

Measure 4: System Reliability

To insure safe, efficient, and reliable service to our riders, it is paramount that system infrastructure and revenue fleet equipment remains reliable and minimizes failures that can cause SEPTA to suspend or significantly delay our service. The following programs will be implemented to help maintain SEPTA's system reliability.

Track and Right of Way renewal Program (MPMS #102565 Track Improvement Program) – In addition to the safety benefits mentioned above, the track renewal program also supports system reliability. See details above.

Vehicle Acquisitions and Overhauls (MPMS #60638 Regional Rail Car & Locomotive Acquisitions; (MPMS# 90512 SEPTA Bus Purchase Program; MPMS# 60582 Vehicle Overhaul Program) – Under this program SEPTA's vehicle fleets are overhauled on a planned schedule to maintain a quality reliable fleet throughout the vehicles service life. The program also provides for the replacement of vehicles and equipment that have exceeded their useful life and for fleet expansion to meet present and projected increases in ridership demands. The vehicle acquisition includes the purchase of 220 new 40-foot Hybrid Buses and 45 Multi-level Regional Rail Cars. In FY22 SEPTA will overhaul the following number of vehicles in the respective fleets.

- Bus – 60-foot articulated (44); 40-foot vehicles (28)
- Broad Street Line (BSL) – 23 Cars
- MFL – 28 cars
- NHSL – 5 cars
- Single Ended Light Rail Vehicles (SE LRVs) – 15 trolleys
- Double Ended Light Rail Vehicles (DE LRVs) – 19 trolleys
- President's Conference Committee II (PCC II) streetcar – 4 trolleys
- Silver Liner IV – 30 cars
- Silver Liner V – 12 Cars

In addition to these Vehicle Overhaul (VOH) fleet numbers, the rail fleet conducts subcomponent overhauls for additional cars in the fleet. These subcomponents include, but not limited to, HVAC systems, Traction Motors, Control Boxes, Software upgrades, and Pantographs.

Rail Vehicle Replacement Program (MPMS #60638 Regional Rail Car & Locomotive Acquisitions) – SEPTA's current capital program is unable to fully fund the procurement of railcars to replace the authority's aging railcar fleets. Pursuing the replacement of rail vehicles is a multi-year commitment that requires sustainable and bondable funding to finance and is not currently available to SEPTA. Without funding necessary to replace these railcars, SEPTA may be forced to reduce or suspend service due to its inability to maintain and safely operate its current railcar fleet. While SEPTA explores a solution to fully funding replacement of its aging railcar fleet, this project provides initial investments necessary to begin procuring replacing the following rail vehicle fleets:

- Silverliner IV Regional Railcars
- Market-Frankford Line Railcars (including vehicle specifications), signal system and infrastructure improvements to enhance operational efficiency This program also includes Market-Frankford rail line enhancements to allow SEPTA to perform analysis and conceptual design of strategic rail service improvement initiatives in advance of new rail vehicles.

Trolley Modernization (MPMS #115472 Projects of Significance) – The goals of the Trolley Modernization program are: A system in full compliance with the Americans with Disabilities Act (ADA); A safe and improved customer experience and providing faster, higher capacity service. Specific activities to be addressed include

the following. Property acquisition for the new Trolley Car Facility/Facilities; Bridge enhancements to support the new Trolley Cars; Trolley Tunnel State of Good Repair Program; Coordination with utilities and the City of Philadelphia; Develop modern trolley station design standards and identify locations with public input and community engagement; Preliminary engineering and program management for overall project; ADA Accessible Trolley acquisition

Rehabilitation of Power Systems and Substations (MPMS #60651 Substations & Power Improvements) – Rehabilitation of electric traction and power systems and associated components including catenary and support structures, feeders, and transmission lines, and localized and centralized control facilities. In FY22 SEPTA will be working on the following Power Systems,

- 30th Street West Catenary Replacement,
- Trolley Tunnel Overhead replacement,
- 18th street switching station.

This program also includes the design necessary for improvements to seven transit substations (Market, Ellen, Ranstead, Park, Broad, Loudon, and Castor), nine railroad substations and switching stations (Neshaminy, Bethayres, Yardley, Lansdale, Hatboro, 18th St./12th St./Portal switching Stations, Cresheim Valley), and one new substation at Woodbourne as well as the Wayne Junction Static Frequency Converter #4 Install and 1-3 replacement. The program also includes procuring long lead equipment such as auto transformers and circuit breakers that will be required for the substation construction projects.

Wheel Truing machine rebuilds (MPMS #102569 Maintenance & Transportation Facilities) – Reconditioning and rebuilding wheel truing machines that have exceeded their useful life. This critical equipment maintains the rail fleet wheels keeping the fleet safe and available for service. When rail wheels cannot be trued, the fleet may need to be held out of service and not available for revenue service.

Sharon Hill line flood mitigation Project (MPMS #107011 Safety & Security Improvements) – This project will provide relief from flooding on the Route 102 Sharon Hill Trolley Line by constructing a pumped drainage system where the Sharon Hill Trolley crosses under a freight railroad bridge at Mile Post 5.30 in Delaware County. This frequently flooded underpass forces SEPTA to rely on a bus substitution program to detour service around the high-water area more than a dozen times each year.