Safety Management Inspection

Southeastern Pennsylvania Transportation Authority & Pennsylvania Department of Transportation State Safety Oversight

Final Report

JULY 2024

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Acronym List

AED	Automated External Defibrillator
ASP	Agency Safety Plan
BSL	Broad Street Line
CARD	Computer-Aided Radio Dispatch
CDL	Commercial Driver's License
CFR	Code of Federal Regulations
CAP	Corrective action plan
DIHI	Data or Information for Hazard Identifications
DOT	Department of Transportation
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FRMP	Fatigue Risk Management Program
FTA	Federal Transit Administration
FTE	Full-time equivalent
GPS	Global Positioning System
HOS	Hours-of-service
MFL	Market-Frankford Line
MUTCD	Manual of Uniform Traffic Control Devices
NHSL	Norristown High Speed Line
NTD	National Transit Database
NTSB	National Transportation Safety Board
PennDOT	Pennsylvania Department of Transportation

100M VRM	100 million vehicle revenue miles
PCC	Presidents' Conference Committee
QPE	Qualified Protection Employee
REE&M	Rail Equipment Engineering and Maintenance
RWP	Roadway worker protection
SCADA	Supervisory Control and Data Acquisition
SCOPE	Safety Cleaning Ownership Partnerships and Engagement
SEPTA	Southeastern Pennsylvania Transportation Authority
SMI	Safety Management Inspection
SMS	Safety Management System
SRM	Safety Risk Management
SSO	State Safety Oversight
SSOA	State Safety Oversight Agency
STPD	Southeastern Pennsylvania Transportation Authority Transit Police Department
U.S.C.	United States Code

Executive Summary

This report documents the results of the Federal Transit Administration's (FTA) Safety Management Inspection (SMI) of the Southeastern Pennsylvania Transportation Authority (SEPTA) (the Authority's) rail and bus transit system and the Pennsylvania Department of Transportation (PennDOT) State Safety Oversight Agency (SSOA).

SEPTA is a regional public transportation authority created by the Commonwealth of Pennsylvania that operates rail transit, fixed-route bus, commuter rail, and electric trolleybus and oversees paratransit services for nearly four million people in the City of Philadelphia and the four surrounding counties. SEPTA is the fifth largest public transit system by size, the sixth largest public transit system by ridership in the United States, and the largest in Pennsylvania. Under FTA's State Safety Oversight (SSO) rule, PennDOT's SSO Division (PennDOT) was certified in 2018 as the SSOA responsible for Federally required safety oversight of the SEPTA rail transit system.

Over the past five years, SEPTA has experienced a deteriorating safety record, with significantly higher rates of fatalities, injuries, and accidents compared to the transit industry average and its peers, particularly on fixed-route buses, trolleys, and heavy rail. Key safety performance indicators have not improved substantially and, in some cases, have worsened, even after enhanced PennDOT intervention directed by FTA in March 2023.

FTA's SMI reviewed the operations and maintenance of SEPTA's heavy rail transit system, six subway-surface trolleys, and two suburban trolley lines. The SMI also reviewed the operations and maintenance of SEPTA's 126-route bus system. FTA did not address SEPTA's commuter rail system, which is under the jurisdiction of the Federal Railroad Administration (FRA), or SEPTA's contracted paratransit or trackless trolley services.

The SMI assessed the identified causes of and contributing factors for recent safety events, the effectiveness of SEPTA's safety training programs, the level and quality of supervision provided for safety-critical activities, and the safety impacts of an increasing number of assaults on workers for SEPTA's workers and passengers. Additionally, the SMI evaluated the effectiveness of PennDOT's SSO program in overseeing and enforcing safety at a rail transit system of SEPTA's size and complexity, including a review of PennDOT's SSO program policies and practices for identifying areas of safety concern and compelling SEPTA to take corrective action.

FTA's SMI activities focused on:

- Reviewing SEPTA data, information, training, and actions to support safety initiatives, resolve safety concerns, and implement a Safety Management System (SMS), as specified in SEPTA's Agency Safety Plan (ASP), PennDOT's SSOA Program Standard, and FTA's Public Transportation Agency Safety Plan regulation at 49 CFR Part 673.

- Observing SEPTA's rail transit and bus operations and vehicle maintenance, including working conditions and adherence to SEPTA, PennDOT, and Federal safety standards.

- Determining how SEPTA established and implemented processes, procedures, tools, and resources to support safety decision-making and safety risk evaluation.

- Evaluating PennDOT's compliance with minimum SSO program requirements.

- Evaluating PennDOT's capacity to implement and execute an effective SSO program to oversee safety performance at a rail transit agency the size and complexity of SEPTA's rail transit system.

The SMI found that SEPTA has an experienced and committed leadership team that has taken steps to support safety improvements. However, the Authority faces several challenges to improved safety performance:

- **Safety impacts of unstable and insufficient funding**, including difficulties in supporting safety programs, ensuring sufficient resources for training and supervision, and adequately resourcing SEPTA's SMS.

- **Safety impacts of assaults on transit workers**, which creates workplace safety risk that have not been fully mitigated.

- **Staffing shortages across key positions**, which contributes to workplace fatigue, reduced training and supervision, and de-prioritization of safety critical activities, such as further developing formalized processes for vehicle inspections and safe vehicle movement in rail yards and maintenance facilities.

- **Inadequate management and training of new bus and trolley operators**, who are involved in a disproportionate share of major collisions, including insufficient operator safety performance evaluations and a lack of training that reflects their operating conditions and mentoring for new operators.

- **On-road safety issues**, including poorly designed streets, outdated rail crossings, and inadequate detour planning.

- **Lack of responsiveness to PennDOT's safety oversight**, with numerous outstanding/delayed corrective action plans (CAPs) and accident investigation reports that mean safety issues are not getting resolved in a timely manner.

- **Limited progress on SMS implementation**, including a lack of organizational structures and processes needed for an effective SMS.

The SMI also identified inadequate PennDOT SSO program resources to enforce corrective actions and effectively monitor SEPTA's safety performance.

To address these concerns, FTA is issuing five Special Directives with required actions for SEPTA and PennDOT. Each Special Directive corresponds to a category of findings in the SMI report.

SEPTA

FTA makes 16 total findings and directs 24 required actions in three categories addressed to SEPTA. To ensure that FTA's SMI findings are resolved, FTA issues three Special Directives (24-1 through 24-3) that identify required actions to be completed by SEPTA. FTA's findings and required actions will strengthen SEPTA's safety posture and improve its safety management capabilities:

- **SMI Report Category 1 (Special Directive 24-1, Transit Worker Safety)**: FTA finds that more needs to be done to ensure safe working conditions for transit workers on the SEPTA system. Since 2020, assaults on SEPTA transit workers have significantly increased, including gun violence, physical assaults, threats, and harassment. This situation has resulted in serious and worsening harm to workers, including injuries and fatalities. FTA also finds that SEPTA workers on the rail transit roadway experience multiple near misses each year and have experienced collisions with passenger trains and maintenance vehicles, resulting in injury and fatality.

- **SMI Report Category 2 (Special Directive 24-2, Capacity of SEPTA's System Safety Division and Control Center to Ensure Safe Operations)**: FTA finds that resource limitations significantly affect the capabilities of SEPTA's System Safety Division to guide SMS implementation, respond to PennDOT CAPs and accident investigation reports in a timely manner with quality products, and act on new and emerging safety concerns. FTA also identifies resourcing, scheduling, training, and evaluation challenges with both SEPTA's Bus and Rail Transit Control Centers.

- **SMI Report Category 3 (Special Directive 24-3, Bus and Rail Transit Safety Issues Contributing to Safety Events)**: FTA finds that critical elements of SEPTA's bus and rail transit operations require more attention to ensure a rested and engaged workforce, adherence to safety rules and procedures, and sufficient training and qualification for SEPTA workers.

PennDOT

FTA makes 14 total findings and directs 17 required actions related to PennDOT's oversight of SEPTA's rail transit system. To ensure that FTA's SMI findings are resolved, FTA is issuing two Special Directives (24-4 and 24-5) to PennDOT. FTA's findings and required actions will take advantage of PennDOT's existing oversight capabilities and further strengthen PennDOT's SSO program for SEPTA:

- **SMI Report Category 4 (Special Directive 24-4: PennDOT SSO Program Resources)**: FTA finds that PennDOT's SSO program requires more resources to address the size and complexity of the SEPTA rail transit system and its systemic safety challenges.

- **SMI Report Category 5 (Special Directive 24-5: PennDOT Safety Oversight of SEPTA's Rail Transit System)**: FTA finds that PennDOT's SSO program has oversight programs in

place to provide enhanced oversight of SEPTA's rail transit system. Once supported by additional staffing and technical resources specified in Category 4, FTA expects that PennDOT's SSO program will have the capacity to address a growing number of rail transit safety issues at SEPTA.

FTA will continue meeting with SEPTA and PennDOT leadership to monitor progress on the findings and required actions outlined in this report.

1. Introduction

FTA administers a national program dedicated to enhancing the safety, reliability, and equity of transit services across the United States. This includes conducting safety risk assessments and implementing a safety regulatory and oversight program.

This report documents the results of the SMI that FTA conducted of SEPTA's rail and bus transit system and the PennDOT SSO program between August 10, 2023, and January 31, 2024. FTA carried out this SMI as part of its safety regulatory and oversight program, as authorized by 49 U.S.C. § 5329.

SEPTA is a regional public transportation authority created by the Commonwealth of Pennsylvania that operates rail transit, fixed-route bus, commuter rail, and electric trolleybus and oversees paratransit services for nearly four million people in the City of Philadelphia and the four surrounding counties: Delaware, Montgomery, Bucks, and Chester. SEPTA is the sixth largest public transit system in the U.S. by ridership and the largest in Pennsylvania. Appendix B: SEPTA Overview further describes the SEPTA transit system.

PennDOT's SSO Division is the SSOA designated by the Commonwealth of Pennsylvania as responsible for overseeing rail transit safety in Pennsylvania. FTA certified PennDOT's SSOA program in April 2018 in accordance with the requirements of Federal transportation law (49 U.S.C. § 5329(e)) and FTA's SSO regulation (49 CFR Part 674). Part 674 does not require, and PennDOT's SSO division does not provide, safety oversight for SEPTA's non-rail transit modes. Appendix C: PennDOT Overview provides an overview of PennDOT's SSO program.

FTA initiated this SMI to assess the escalating pattern of safety incidents and concerns on SEPTA's rail transit and fixed-route bus transit system and provide a roadmap for building a robust safety culture within the Authority. The SMI also evaluated PennDOT's effectiveness and role as the designated SSOA for rail transit safety at SEPTA.

FTA's SMI reviewed the operations and maintenance of SEPTA's heavy and trolley rail transit system, including:

- the Market-Frankford Line (MFL) subway-elevated;
- the Broad Street Line (BSL) subway;
- the Norristown High Speed Line (NHSL); and
- SEPTA's six subway-surface trolley and two suburban trolley lines.

FTA also reviewed the operations and maintenance of SEPTA's 126-route bus system. FTA did not address SEPTA's commuter rail system, which is under the jurisdiction of FRA, nor did it include SEPTA's contracted paratransit service or trackless trolleybus transit mode.

FTA's SMI assessed the identified causes and contributing factors for recent safety events, the effectiveness of SEPTA's safety training programs, the level and quality of supervision provided for safety-sensitive functions,[1] and the safety impacts of an increasing number of assaults on workers for SEPTA's transit workers and passengers.

FTA's SMI also evaluated the effectiveness of PennDOT's SSO program to oversee and enforce safety at a rail transit system of SEPTA's size and complexity. This included review of the SSOA's policies and practices for identifying areas of safety concern and compelling SEPTA to take action to address rail transit safety concerns.

Need for SMI

On August 10, 2023, FTA notified SEPTA and PennDOT regarding its decision to conduct an SMI. FTA's determination was based on the following reasons:

- **SEPTA's safety record** – Over the past five years, SEPTA has experienced a significantly higher rate of fatalities, injuries, and accidents compared to the transit industry average and its peers, particularly in its fixed-route bus, trolley, and heavy rail systems.

- **Lack of substantial safety improvements** – Despite ongoing oversight by the FTA and active efforts by SEPTA and PennDOT to implement improvements, key safety performance indicators identified and tracked by SEPTA, such as the number of pedestrian knock downs, fires, derailments, and rail intersection collisions, have either not shown significant progress after a notable decline in 2021 or have continued to worsen.

- **Outstanding and delayed corrective actions** – PennDOT has been unable to close numerous outstanding and delayed SEPTA corrective action plans and incomplete accident investigation reports, indicating a need for further intervention.

- **Surge in assaults against transit workers** – Since 2019, SEPTA has witnessed a concerning increase in assaults against its operators and other transit workers, a trend that has intensified since the onset of the COVID-19 pandemic. SEPTA's rate of assault has significantly exceeded the industry average each year between 2019 and 2023.

- **Continued occurrence of serious incidents** – Since the initiation of the SMI in August 2023, SEPTA has continued to experience severe incidents, including transit worker injuries and fatalities, derailments, assaults on transit workers, and near misses, highlighting the urgent need for a comprehensive safety review.

[1] See 49 CFR § 655.4 "Safety-sensitive function".

FTA Authority

FTA manages the National Public Transportation Safety Program to improve the safety of public transportation systems that receive Federal financial assistance under chapter 53 of Title 49, United States Code, through the administration of the Public Transportation Safety Program at 49 U.S.C. § 5329. FTA's safety program includes safety regulations, technical assistance, training, and safety data collection and analysis. For rail transit agencies, FTA also certifies and monitors SSOAs charged with overseeing and enforcing compliance with Agency Safety Plans (ASPs), as required in 49 CFR Part 673, and SSO program standards, as required in 49 CFR Part 674.

The framework for Federal transit safety oversight and enforcement is specified in FTA's Public Transportation Safety Program and FTA's implementing regulation at 49 CFR Part 670. FTA's authority to conduct inspections, such as an SMI, and any supporting inspections, audits, examinations, or testing is specified at 49 U.S.C. § 5329 and 49 CFR § 670.11.

FTA has authority to issue Special Directives in certain situations, including when FTA identifies unsafe conditions and practices where there is a substantial risk of death, personal injury, or damage to property or equipment, as specified in 49 CFR § 670.27. In situations where FTA identifies safety concerns with the potential to result in injury, fatality, or property damage, FTA has the authority, as outlined in §§ 670.21(c) and (d), to require corrective action or issue restrictions or prohibitions to address unsafe conditions or practices. This authority allows FTA to take immediate action to mitigate identified risks.

Furthermore, FTA has the power to direct or re-direct Federal grant funding to address safety violations before funds are used for other purposes. In extreme cases, FTA may withhold up to 25 percent of funds apportioned under 49 U.S.C. § 5307 until safety violations are adequately addressed.

FTA's role is pivotal in maintaining and enhancing the safety of the public transit network in the United States, ensuring that millions of daily commuters travel safely. This comprehensive approach to safety oversight, through regulations, support, training, and data analysis, reflects FTA's commitment to public transit safety at the national level.

SMI Background and Initiation

FTA relies on data from the National Transit Database (NTD) and the SSO reporting tool to monitor the safety performance of rail and bus transit agencies. Additionally, FTA conducts scheduled sessions with SSOAs to discuss the safety performance of rail transit agencies. FTA also conducts triennial audits of each SSO program nationwide to assess the SSOA's implementation of requirements under 49 CFR Part 674, the State Safety Oversight regulation, including their actions to oversee safety at rail transit systems under their jurisdiction.

FTA's concerns regarding SEPTA's rail and fixed-route bus safety escalated over time due to notable accidents and safety performance metrics continuing to exceed national industry averages.

The timeline of FTA's safety concerns and initiation of the SMI is as follows:

- **February 2, 2023**: FTA conducted an analysis of SEPTA's safety performance based on data from September 2017 to August 2022. FTA communicated the results of this analysis to PennDOT, highlighting SEPTA's above-average rates of rail transit fatalities, injuries, and derailments.

- **March 7, 2023**: FTA sent an Immediate Action Letter to PennDOT, identifying several concerning trends in data SEPTA reported to the NTD from September 2017 to August 2022. In analyzing this data, FTA found:

    - SEPTA's fatality rate exceeded the nationwide average fatality rate for four of the six modes SEPTA operates—heavy rail, streetcar, bus, and trolleybus.

        - SEPTA's heavy rail fatality rate is approximately three times the industry's heavy rail fatality rate.

        - SEPTA's trolley (streetcar) fatality rate is approximately 25 percent higher than the industry streetcar fatality rate.

    - SEPTA's injury rates exceeded the national average at five of its six modes: heavy rail, streetcar, bus, trolleybus, and demand response.

        - SEPTA's injury rate for heavy rail is approximately 50 percent higher than the industry heavy rail injury rate.

        - SEPTA's streetcar injury rate is approximately 25 percent higher than the industry streetcar injury rate.

    - SEPTA's derailment event rate for heavy rail (at twice the national average) outpaced the nationwide average four of the five years of the analyzed period.

    - SEPTA's derailment event rate for the streetcar increased in the last three years of the analyzed period.

    FTA's Immediate Action Letter required PennDOT to respond with a plan addressing these safety concerns, including mitigation strategies, implementation schedules, and outcome assessments. FTA's letter also clarified that addressing these shortcomings at SEPTA required in-person observation and aggressive oversight of the implementation and performance of SEPTA's safety policies and procedures. In addition, FTA noted that a significant number of SEPTA's approved CAPs are open and that PennDOT has not

utilized its enforcement authority to ensure that SEPTA takes specific actions to eliminate collisions, avoid derailments, and prevent runaway trains.

- **March 28, 2023**: PennDOT responded to FTA, as required within 15 days, detailing activities currently underway to oversee SEPTA's rail transit system and outlining additional, high-level actions the agency will take to address FTA's concerns. The letter included a matrix documenting actions that PennDOT planned to take to oversee working groups established at SEPTA to develop mitigation strategies to reduce suicides and falls to the track, collisions, derailments, signal violations, and yard safety concerns on heavy rail and trolley systems. As required by FTA, the matrix also included milestones, measures for successful outcomes, and planned in-person safety inspections and reviews of SEPTA safety policies and procedures.

  However, FTA found that PennDOT's letter lacked sufficient analysis or rationale connecting PennDOT's oversight efforts to the effectiveness of SEPTA's established working groups. PennDOT also did not explain why the SSOA believed these working groups would successfully mitigate the safety issues or mitigate them in a timely manner. PennDOT did not include alternative or additional oversight actions for a more immediate response to the concerns raised by FTA.

- **May 31, 2023**: PennDOT further responded to FTA's Immediate Action letter, as required within 60 days, detailing their actions in relation to SEPTA's safety oversight. According to PennDOT, as of the date of their letter, there were no open overdue CAPs for SEPTA; 26 open CAPs were under review for closure, and 19 open CAPs had compliant target completion dates. PennDOT also indicated that it finalized its enforcement escalation plan, to be published in the July 2023 Program Standard, and asserted that the required inspections of SEPTA's rail transit tracks and facilities were in progress.

  However, PennDOT's letter did not address FTA's specific concern regarding the repeated extensions provided for SEPTA's CAP closure dates, which led to delays in rectifying known safety issues. Additionally, PennDOT's letter lacked an explanation regarding how the steps in its newly completed escalation process had effectively expedited the correction of deficiencies in SEPTA's internal safety review program or the management of open CAPs. Lastly, there was no evidence provided in the letter to verify that the required inspections at SEPTA were indeed taking place as mandated.

- **July 2023**: SEPTA experienced five major safety incidents in a single week, including trolley collisions, a runaway trolley, and bus crashes, resulting in over 30 injuries and a fatality.

- **August 10, 2023**: FTA officially notified SEPTA and PennDOT of its intent to conduct an SMI of SEPTA rail and fixed-route bus operations to inform subsequent safety measures.

- **September 11, 2023**: FTA formally initiated the SEPTA SMI with a visit to Philadelphia and meetings with SEPTA management, PennDOT leadership, and SSOA representatives. Based on this initial kick-off, FTA developed an SMI work plan that considered the rail and bus transit system's day-to-day operations.

SMI Safety Performance Analyses

In August 2023, FTA updated its initial analysis of SEPTA's safety performance by examining NTD data from June 2018 to May 2023, for SEPTA's fixed route bus as well as its heavy rail and trolley (streetcar) modes of service. This analysis revealed significant safety concerns in comparison with the national averages by transit mode when measured per 100 million vehicle revenue miles (100M VRM). SEPTA's safety performance challenges include:

- **Bus Service:** SEPTA's bus service experienced a notably high number of collisions, with rates of events, fatalities, and injuries surpassing national averages. See
- Figure 1 below.

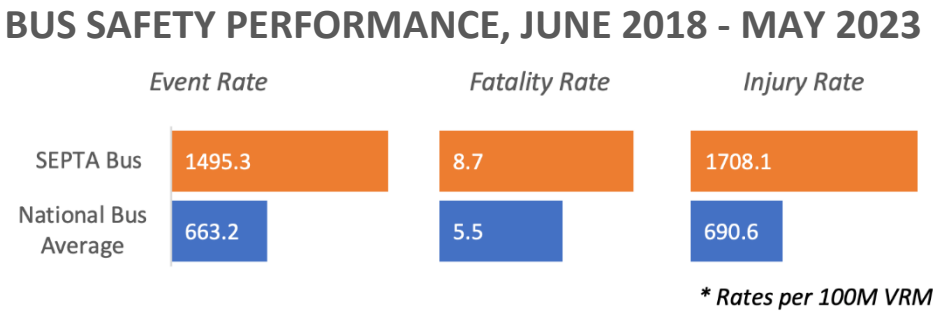

Figure 1. SEPTA Bus Safety Performance, June 2018 - May 2023

- **Heavy Rail:** SEPTA's heavy rail system experienced numerous collisions, homicides, assaults, derailments, and other events, leading to fatality and injury rates that exceed the national average. See Figure 2 below.

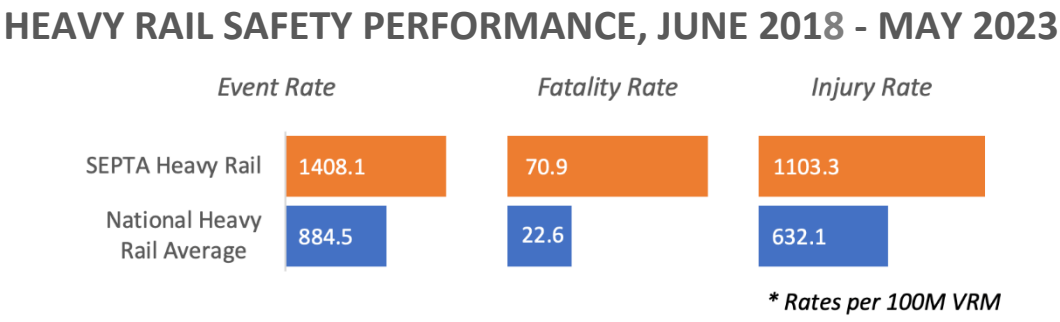

Figure 2. SEPTA and National Heavy Rail Safety Performance, June 2018 - May 2023

- **Streetcar Service:** Despite an event rate that is below the national average, SEPTA's streetcar (trolley) service fatality and injury rate exceeds the national average. See Figure 3 below.

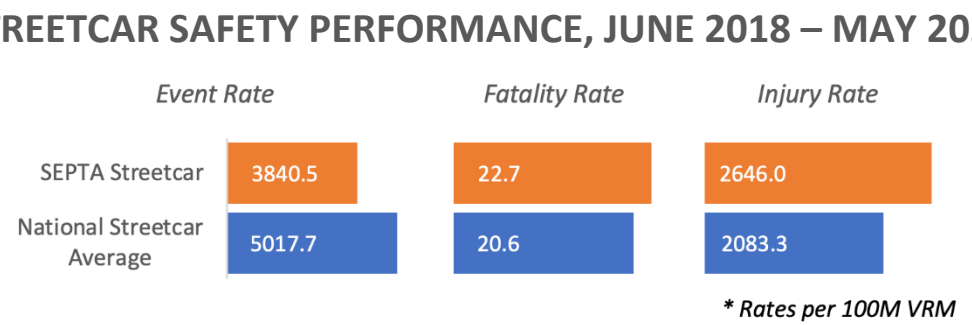

Figure 3. SEPTA and National Streetcar Safety Performance, June 2018 - May 2023

National Transportation Safety Board Investigations

Prior to initiating the SMI, FTA also examined rail transit safety information from investigations performed by the National Transportation Safety Board (NTSB). From 2017 to 2023, SEPTA has been the subject of eight NTSB investigations. These investigations cover four rail vehicle to rail vehicle collision events, three rail vehicle collisions with one or more individuals, and a recent streetcar runaway event from July 2023. These eight accidents resulted in three fatalities, 98 injuries, and an estimated $2,116,680 in SEPTA property damage. Table 1 below summarizes information published by the NTSB. The events are listed in chronological order.

National Transportation Safety Board Investigations at SEPTA			
Summary	***Injuries***	***Fatalities***	***Estimated Property Damage[2]***
*On January 4, 2017, trolley 9101, traveling northwest on **Route 10**, stopped to offload passengers Trolley 9085 struck the stopped SEPTA Trolley 9101 at an estimated impact speed of 10 miles per hour (mph).*	*40*	*–*	*$60,000*
*On February 21, 2017, train 57 was traveling westbound on the **Market–Frankford Line** when it struck stopped train 67. The collision and associated derailment also caused Train 67 to strike SEPTA Train 51, which was operating in the opposite direction on the adjacent track.*	*4*	*–*	*$1.6 M*
*On August 22, 2017, an occupied railcar on the **Norristown High Speed Line** collided with a stopped, unoccupied railcar*	*43*	*–*	*$331,680*
*On September 23, 2018, on the **Broad Street Line**, a child was struck and killed near the Allegheny Station platform.*	*–*	*1*	*–*

[2] NTSB estimated property damage includes transit agency, private, and all other property.

National Transportation Safety Board Investigations at SEPTA			
Summary	***Injuries***	***Fatalities***	***Estimated Property Damage[2]***
*On July 8, 2019, two SEPTA roadway workers were struck by a train on the **Broad Street Line.***	*1*	*1*	*–*
*On July 28, 2021, a man fell from the **Spring Garden Station** platform into the path of a train and was struck and killed.*	*–*	*1*	*–*
*On December 9, 2021, a freight train struck a trolley near **Main Street and 6th Street**.*	*7*	*–*	*$125,000*
*On July 27, 2023, a maintenance worker operating a trolley near **Elmwood Maintenance Facility** was unable to apply the brakes to stop the trolley from moving downhill. The worker jumped from the vehicle, and the vehicle continued downhill, colliding into a privately owned vehicle, then derailed and crashed into the Blue Bell Inn. Investigation ongoing.[3]*	*3*	*–*	*$800,000*

Table 1. SEPTA National Transportation Safety Board Investigations 2017 – Present

Methodology

The SEPTA SMI is divided into five phases:

Figure 4. Phases of the SEPTA SMI

Based on accident trends and safety concerns identified during monitoring activities, FTA concentrated the SMI on the following areas:

- SEPTA rail transit operations and vehicle maintenance,
- SEPTA fixed-route bus operations and vehicle maintenance,
- SEPTA passenger environment and personal safety,
- SEPTA safety training, qualifications, and resources, and

[3] Still under investigation during SMI.

- PennDOT SSO Division's safety oversight activities.

FTA's SMI inspection team consists of FTA personnel and contractor staff, with subject matter expertise including rail and bus operations, SMS, vehicle maintenance, safety communications, safety training and qualifications, transit security, and emergency preparedness, roadway worker protection (RWP), and transit management.

Phase 1: Notification and Initiation

FTA initiated a comprehensive review of SEPTA's operational and safety practices with formal notification to SEPTA and PennDOT on August 10, 2023. The official SMI initiation was held on September 11–12, 2023, and marked the beginning of an extensive evaluation process.

Phase 2: Research and Document Review

FTA conducted initial research based on available NTD information, NTSB accident investigations, documentation in the SSO reporting tool, and news and media reports. FTA issued a formal request to SEPTA and PennDOT for documents and records, including plans, governing documents, records, data analysis reports, operating rules, maintenance standards, accident investigations, and meeting notes, among other documentation.

In this phase, FTA evaluated:

- the quality and reliability of the information gathered,
- instances of non-compliance,
- activities in place to address known safety concerns and
- safety communications throughout SEPTA.

Through this review, FTA identified preliminary safety concerns to inform the virtual and on-site interview questions and activities.

Phase 3: Interviews and Inspections

FTA conducted a series of interviews and inspections designed to assess SEPTA's and PennDOT's safety and safety oversight programs and adherence to their own and FTA's rules and regulations.

In all, FTA requested and reviewed over 1,500 documents from SEPTA and PennDOT and conducted over 150 interviews, including SEPTA executive and technical leadership, mid-level management, supervisors, and frontline transit workers, as facilitated by union leadership, and with PennDOT SSO Division representatives.

Eight FTA teams conducted numerous field inspections of SEPTA's Operations Control Center, stations, routes, maintenance facilities, and vehicles, spending nine days on the system.

Phase 4: Final Report and Special Directives

FTA held exit briefings with PennDOT and SEPTA on January 30, 2024. A draft SMI report was provided to SEPTA and PennDOT for factual review in May 2024.

Special Directives

Through the SMI, FTA identified several concerns in need of immediate action. To address these concerns, FTA is issuing three Special Directives to SEPTA and two Special Directives to PennDOT simultaneously with this final SEPTA SMI report.

Appendix A: List of Findings and Required Actions contains a full listing of FTA's SMI findings and required actions for SEPTA and PennDOT.

Phase 5: Corrective Action Management

Upon issuance of the final report and associated Special Directives, FTA will oversee the development, implementation, and progress of corrective actions to address all findings and required actions.

2. Findings and Required Actions

SEPTA

FTA makes 16 total findings and 24 required actions in three categories addressed to SEPTA. To ensure that FTA's SMI findings are resolved, FTA issues three Special Directives (24-1 through 24-3) that identify required actions to be completed by SEPTA. FTA's findings and required actions will strengthen SEPTA's safety posture and improve its safety management capabilities:

- **SMI Report Category 1 (Special Directive 24-1, Transit Worker Safety)**: FTA finds that more needs to be done to ensure safe working conditions for transit workers on the SEPTA system. Since 2020, assaults on SEPTA transit workers have significantly increased, including gun violence, physical assaults, threats and harassment, disorderly conduct, and hostility. This situation has resulted in serious and worsening harm to workers, including injuries and fatalities. FTA also finds that SEPTA workers on the rail transit roadway experience multiple near misses each year and have experienced collisions with passenger trains and maintenance vehicles, resulting in injury and fatality.

- **SMI Report Category 2 (Special Directive 24-2, Capacity of SEPTA's System Safety Division and Control Center to Ensure Safe Operations)**: FTA finds that resource limitations significantly affect the capabilities of SEPTA's System Safety Division to guide SMS implementation, respond to PennDOT corrective action plans and accident investigation reports in a timely manner with quality products, and act on new and emerging safety concerns. FTA also identifies resourcing, scheduling, training, and evaluation challenges with both SEPTA's Bus and Rail Transit Control Centers.

- **SMI Report Category 3 (Special Directive 24-3, Bus and Rail Transit Safety Issues Contributing to Safety Events)**: FTA finds that critical elements of SEPTA's bus and rail transit operations require more attention to ensure a rested and engaged workforce, adherence to safety rules and procedures, and sufficient training and qualification for SEPTA workers.

PennDOT

FTA makes 14 total findings and 17 required actions related to PennDOT's oversight of SEPTA's rail transit system. To ensure that FTA's SMI findings are resolved, FTA is issuing two Special Directives (24-4 and 24-5) to PennDOT. FTA's findings and required actions will take advantage of PennDOT's existing oversight capabilities and further strengthen PennDOT's SSO program for SEPTA:

- **SMI Report Category 4 (Special Directive 24-4: PennDOT SSO Program Resources)**: FTA finds that PennDOT's SSO program requires more resources to address the size and complexity of the SEPTA rail transit system and its systemic safety challenges.

- **SMI Report Category 5 (Special Directive 24-5: PennDOT Safety Oversight of SEPTA's Rail Transit System)**: FTA finds that PennDOT's SSO program has oversight programs in place to provide enhanced oversight of SEPTA's rail transit system. Once supported by additional staffing and technical resources specified in Category 4, FTA expects that PennDOT's SSO program will have the capacity to address a growing number of rail transit safety issues at SEPTA.

Each category, related findings, and required actions for SEPTA and PennDOT are discussed below.

Category 1 – Transit Worker Safety

FTA's SMI identifies concerns with ensuring safe working conditions on the SEPTA system. Since the COVID-19 pandemic, assaults against transit workers have significantly increased, including gun violence, physical assaults, threats and harassment, disorderly conduct, and hostility. This situation has resulted in serious and worsening harm to workers.

FTA also finds that SEPTA workers on the rail transit roadway experience multiple near misses per year and have experienced major collisions with passenger trains and maintenance vehicles resulting in injury.

FTA's SMI report issues four Findings and six Required Actions in this area.

Category 1 Finding 1. **SEPTA Must Expand Activities to Protect Transit Workers from Assault**

Background

FTA identifies assault as a significant worker health and safety issue. A 2019 Federal Register notice[4] confirmed that the risk related to assaults on transit workers should be managed through the Safety Risk Management (SRM) process required under Part 673. FTA defines assault on a transit worker as attacking a transit worker performing duties. This includes threats, harassment, spitting, physical strikes, and raising or using a weapon.

FTA reviewed SEPTA reports and assault data showing over 2,100 attacks on SEPTA workers since 2019, including verbal harassment and physical violence. FTA assessed crime statistics and national assaults on transit worker trends to contextualize SEPTA's situation, and FTA interviewed leadership, frontline transit workers, and members of SEPTA's Transit Police Department (STPD).

FTA finds that assaults on SEPTA's transit workers have caused worker fatality, worker injury and absence, and increased levels of stress for the worker who has been assaulted and for their coworkers.

[4] See FTA's notice.

Meeting with SEPTA's largest transit union, Transport Workers Union Local 234, FTA interviewed numerous bus and trolley operators and other workers about their experiences with on-the-job assaults, unsafe conditions, and the impacts of SEPTA's operating environment on safety in general. FTA rode the SEPTA system and inspected high-risk locations[5] identified by management and workers to directly observe safety risk faced by transit workers.

STPD and SEPTA's System Safety Division track assaults on operators. STPD prepares a special report outlining specific areas and routes that have increased assault totals. SEPTA monitors its Control Center logs to track all reports of physical and verbal assault, including spitting, throwing, punching, threats with firearms and other weapons, verbal threats, and, since 2019, a category that SEPTA terms "disrespect," which refers to verbal threats to operators or harassment resulting from in-service interactions with passengers. Dating back to 2018, SEPTA has issued reports of the numbers, locations, and times-of-day physical and non-physical assaults on transit workers to guide prioritization of Authority and STPD actions and resources to protect workers. Until April 2023, when FTA revised NTD reporting thresholds, SEPTA's reports on assaults on SEPTA workers greatly exceeded NTD's requirements for capturing and reporting this information.

SEPTA reports for the period 2018 through 2023 show that assaults on SEPTA workers increased 284 percent from 2019 to the 2020 pandemic year. After a small 2022 dip, assaults hit an all-time high of 572 in 2023.[6] See Figure 5 below.

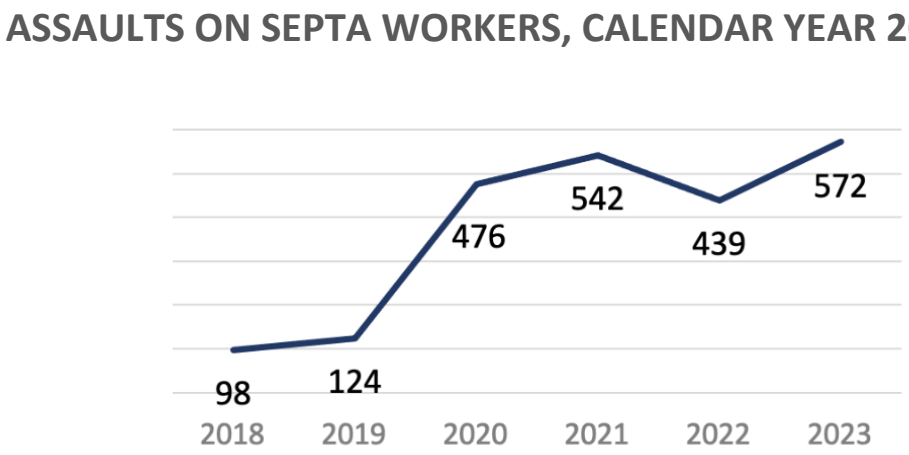

Figure 5. Assaults on SEPTA Workers, Calendar Year 2018-2023[7]

[5] Geographic areas or place where safety concerns for SEPTA workers are concentrated.

[6] SEPTA uses Control Center logs and reports to establish numbers of physical and non-physical assaults for transit workers, dating back to 2018.

[7] Data provided from SEPTA Transit Police Department and System Safety Division.

For four of six years since 2018, the number of physical assaults also increased, from 13 in 2018 to 53 in 2022, with 49 occurring in 2023, as shown in Table 2 below. Tragically, in October 2023, while FTA was onsite during the SMI, a bus operator was shot and killed. This underscores the urgency for immediate action to address safety concerns and protect SEPTA workers.

Year	Total Assaults (Change from Prior Year)		Physical Assaults Only (Change from Prior Year)	
2018	98	–	13	–
2019	124	(+ 26.5%)	46	(+ 253.8%)
2020[8]	476	(+ 283.9%)	38	(- 17.4%)
2021	542	(+ 13.9%)	49	(+ 28.9%)
2022	439	(- 19.0%)	53	(+ 8.2%)
2023	572	(+ 30.3%)	49	(- 7.5%)
Total Change 2018-2023		**(+ 483.7%)**		**(+ 276.9%)**

Table 2. Total Assaults and Physical Assaults on SEPTA Workers, Calendar Year 2018-2023[9]

FTA finds that the persistent threat of assault creates a climate of fear among SEPTA workers, which can lead to distraction, rushed decision-making, reduced situational awareness, and potential escalation to physical altercations. These factors can contribute to safety events, high worker turnover, and underreporting of hazards.

STPD consistently identifies fare evasion as a leading cause of assaults on transit workers. STPD tracks fare evasions by route, day of the week, and time of day and generates heat maps, demonstrating significant problem areas. While fare evasion is a primary cause, STPD reports that increasingly disputes leading to assault arise from late or delayed service, crowding on vehicles, passenger concern over perceived slights, and unexpected outbursts, potentially related to mental illness or drug addiction.

As noted by SEPTA leadership, the increase in assaults on SEPTA transit workers has occurred during a time of increased crime in the Philadelphia area as a whole. Philadelphia continues to grapple with significant challenges, including gun violence, public drug use, high rates of drug overdose deaths, homelessness, and a poverty rate that affects more than 20 percent of its residents.[10] These pervasive issues impact the transit system, creating an environment that may contribute to an increased risk of assault on transit workers.

[8] First year SEPTA began tracking "incidents of disrespect."

[9] Data provided by SEPTA Transit Police Department and System Safety Division.

[10] See Philadelphia 2024: State of the City, The Pew Charitable Trusts, Pew Research, Philadelphia Research and Policy Initiative.

Over the last few years, in response to violent crime and antisocial behavior on the SEPTA system, SEPTA has taken measures to support SEPTA workers, such as expanding access to an employee assistance program and counseling services through the University of Pennsylvania and to support vulnerable individuals on the transit system, such as creating its Safety, Cleaning, Ownership, Partnership, and Engagement (SCOPE) program. This first-in-the-nation program works to assist the hundreds of unsheltered and vulnerable individuals on the transit system, connecting them with resources while also supporting the cleaning of stations and the removal of homeless encampments from transit property. The SCOPE program also administers lifesaving Narcan to passengers suffering drug overdoses and works to address smoking, loitering, and other quality-of-life issues which can contribute to an environment of perceived lawlessness on the system. SEPTA also partnered with the City of Philadelphia to establish a year-round permanent location for the Hub of Hope project, which offers case management, showers, and laundry facilities, transportation to the shelter, and access to health care services.

SEPTA also increased STPD resources, including work to fully staff its budgeted allocation of 194 sworn transit police officers and an additional 79 administrative and civilian positions. In addition to these positions, STPD also recently started a Virtual Patrol program, using civilians to monitor camera systems and video feeds and notify STPD of potential incidents for officer deployment. STPD also promotes its free Transit Watch App as an immediate, discreet way for customers and workers to communicate in real time with STPD about incidents on SEPTA, including crime, cleanliness, smoking, and issues related to vulnerable populations.

For the rail transit system, STPD has revised its approach to officer deployment, moving from fixed posts at areas with high criminal activity and misconduct to mobile patrols on trains and in stations. STPD bolsters its presence to support end-of-line operations at rail transit terminals with security guards. STPD also allocates resources to bus operations based on patterns of criminal activity and misconduct and to respond to in-service events, emergency alarms, and calls for service.

While this level of police activity represents a significant amount of effort, and while SEPTA experienced a reduction in most categories of violent crime in 2023 and early 2024, FTA also found that transit workers across all modes identified the lack of police presence, particularly on SEPTA's bus system, as a major challenge in providing safe service. Bus operator interviews indicated that the lack of police presence leaves transit workers solely responsible for maintaining the safety of their vehicles and that disorderly passengers, without deterrence from law enforcement presence, become emboldened to commit crimes that can impact the ability of bus operators to perform their jobs safely.

To further improve safety, SEPTA workers recommended redesigning operator partitions, updating de-escalation training, launching a public awareness campaign, and ensuring all buses are equipped with functioning cameras and audio monitoring. SEPTA has also requested a whole-city policing solution from the City of Philadelphia and its partners to make transit safety a higher priority.

Required Action

Finding 1.1	**SEPTA Must Expand Activities to Protect Transit Workers from Assault**
Required Action 1	Within 90 days of issuance of this report, SEPTA must develop an action plan that includes actions to be taken, required resources, dedicated funding sources, milestones to implement, and oversight activities to safeguard the welfare of employees on the SEPTA system from assault on rail transit and bus modes. At a minimum, this plan must consider the following: • Redesign of operator cabs on buses and trolleys to provide greater protection for operators, to include current fleet cab changes, and what is to be required for the new trolleys and buses that are in the acquisition process. • Coordinated approach with local law enforcement for the management of silent bus alarm notifications to ensure rapid and coordinated response. • Enhanced approach to bus patrol and security for bus operators, including uniformed presence on buses and at transfer centers. • Enhanced approach to managing security for end-of-line locations on bus and rail transit, including uniformed presence. • Enhanced support for full build-out of SEPTA's SCOPE Program. • Enhanced training for SEPTA employees to equip them with the necessary skills to handle and prevent incidents of assault and harassment. • Public education campaign to raise awareness among passengers about the importance of maintaining a safe and respectful environment and importance of SEPTA employees for the region. • In coordination with Finding 3, enhanced data collection and reporting on incidents of assault to be regularly shared with relevant authorities to inform ongoing safety initiatives. SEPTA must submit the action plan to FTA for review, approval, and implementation monitoring.

Required Action 2	Beginning 30 days after FTA's approval of the action plan in Finding 1.1, Required Action 1 (Required Action FTA-24-1-001-1 of Special Directive 24-1), SEPTA must provide monthly progress reports on its implementation of the action plan to FTA.

Category 1 Finding 2. Clarification Needed to Ensure Frontline Transit Workers Understand Action They Must Take in Response to Fare Evasion

Background

The Operations Division Customer Service Manual Rule CS-60 requires bus and trolley operators to "check that a fare has been tendered and, if not, request the base fare" – a policy operators commonly call "check and request." Interviews with bus and trolley operators noted that this policy often leads to confrontations with passengers, which creates the risk of assault and creates a hostile driving environment. Carrying out this policy can also affect passenger safety if an assault or confrontation occurs while passengers are boarding or exiting the vehicle or while the bus or a wheelchair lift is in motion.

In interviews at all levels, FTA received numerous and conflicting interpretations regarding how the policy should be implemented. While SEPTA's leadership team indicated that this policy is no longer in effect, many transit workers believed this policy was still valid and that they were responsible for carrying it out. Operators stated that implementing this policy forces them into dangerous situations where they could be injured in an assault or harassed. However, they reported that if they do not "check and request" or if they record too many fare evaders, they face discipline.

The "check and request" policy remains in the Operator Rule Book, though management indicated in interviews that there are plans to remove it during the next Rule Book update, but there is no set date for this action.

As a result, FTA finds that SEPTA must clarify expectations regarding the "check and request" policy and recording fare evasion. Removing outdated policy direction that endanger operators should be an urgent priority. Expectations must be consistent across leadership and operating districts. Policies should minimize confrontation risk while supporting Authority revenue needs and customer service standards.

Required Action

Finding 1.2	**Clarification Needed to Ensure Frontline Transit Workers Understand Action They Must Take in Response to Fare Evasion**
Required Action 3	Within 30 days of issuance of this report, SEPTA must issue a communication clarifying expectations for transit workers regarding the "Check and Request" practice, currently in SEPTA's Operator Rule Book, specific to the response to and recording of fare evasion. SEPTA leadership also must ensure that expectations are actively communicated to all SEPTA frontline transit workers and that SEPTA transit workers are provided the opportunity to ask questions. SEPTA must submit a draft of the communication to FTA for review and approval, the issued communication, documentation verifying dissemination of the communication to all frontline employees, and the mechanism used to discuss the communication and provide employees with the opportunity to ask questions and have them answered.

Category 1 Finding 3. Limited Collection of Information on Operating Conditions that Lead to Safety Concerns for Frontline Workers

Background

SEPTA relies on its Operator's Accident/Incident Form (Form 5039), police reports, and calls to the Control Center to gather information when operators face harassment, threats, safety issues, or concerning passenger behaviors while in passenger service. However, FTA finds these methods insufficient for properly capturing assault and safety risk data for transit workers.

SEPTA actively collects information on assaults on transit workers to report to FTA through the NTD program through police reports, completed Form 5039s and calls to the Control Center.

Form 5039, which is filled out at the end of the shift during which the accident or incident occurred, was not specifically designed for the purpose of collecting information on assaults on transit workers or safety concerns. In interviews, operators say it is overly burdensome for documenting incidents, so many do not complete it, perceiving it as wasted effort. Even when submissions occur, transit workers expressed doubts that the reports spur constructive action or prevent recurrences without additional SEPTA or police support. Based on this feed-back, FTA is concerned that operator assaults, particularly non-major assaults, may be significantly under-reported.

Likewise, while calls to the Control Center facilitate real-time response, they yield limited data to analyze trends. Information collected in the Control Center from transit operators regarding threatening situations that occurs in service may not be uniformly entered to support trending.

STPD has explicitly requested more comprehensive reporting with additional information from transit workers regarding their experiences to support their ability to protect transit workers.

FTA does not prescribe methods of data collection on assaults on transit workers other than the data must meet the requirements set forth by the current NTD Safety & Security Reporting Policy manual.[11] FTA does clarify that reports should contain enough detail to verify that a transit worker has been assaulted. Examples of data collection methods can include police reports, reports or statements by passengers, or reports by transit workers.

By not providing a form or tool for SEPTA workers to easily report instances of assault and threatening behavior in service, SEPTA is not collecting data critical to its efforts to improve the safety of transit workers. While SEPTA does take follow-up action with workers after instances of assault, including medical attention, police investigation, and access to an employee assistance program, these actions can only be taken if SEPTA leadership is aware that an assault on a transit worker has occurred. Reliance on inadequate forms and tools not only hinders data collection but also leaves operators feeling unheard and unsupported in dangerous or challenging situations.

To properly assess and tackle these risks to the safety of SEPTA workers, FTA finds that a straightforward, tailored reporting system for assaults, harassment, and other concerning incidents to occur in service is required. Mechanisms should minimize operator burden while maximizing actionability for follow-up and prevention. Supervisors and SEPTA leadership must also reinforce that they value these reports to protect transit worker wellbeing and spur change.

While additional reforms discussed in other SMI findings can further mitigate risks going forward, reliable data capture through transit worker reporting is the essential first step. SEPTA must better support its workers in this process if it wishes to address the pressing safety concerns faced by the Authority.

[11] See NTD Reporting Manuals.

Required Action

Finding 1.3	**Limited Collection of Information on Operating Conditions that Lead to Safety Concerns for Frontline Workers**
Required Action 4	Within 60 days of issuance of this report, SEPTA must conduct an analysis of the current process used to collect information from transit workers on assaults and safety concerns in passenger service, including use of Form 5039, calls to the Control Center, and other employee reporting programs. SEPTA must submit this analysis to FTA for review and approval. Within 30 days of FTA approval of the analysis, SEPTA must develop an action plan and implementation schedule to improve collection of this information from transit workers. SEPTA must submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.
Required Action 5	Within 90 days of issuance of this report, SEPTA must begin conducting monthly analysis of the information provided by SEPTA workers on assaults and safety concerns in passenger service. FTA expects that monthly reporting will improve in detail as the action plan in Finding 1.3, Required Action 4 (Required Action FTA-24-1-003-1 of Special Directive 24-1) is implemented. SEPTA must share the results of its analysis monthly with SEPTA Police and SEPTA Transit Managers for action and submit the monthly results to FTA.

Category 1 Finding 4. **Qualified Protection Employees Need Additional Training and Routine Evaluation to Ensure Their Capabilities to Set Up Worker Protection**

Background

Rail transit roadway workers face many on-the-job hazards from moving trains, electrified rails, and tight clearances in tunnels and elevated tracks. Weather, traffic, poor visibility, train speeds, and short work windows can increase safety risk for workers. Transit agencies use various RWP programs to establish safety rules, training, communications protocols, and on-track protections that aim to safeguard workers.

Many rail transit agencies, such as SEPTA, base their RWP programs on modified FRA regulations. A key role in SEPTA's RWP program is the Qualified Protection Employee (QPE), a SEPTA worker who is qualified on the operating rules, physical characteristics, and on-track protection procedures and is responsible for establishing on-track protection and safety.

In interviews with SEPTA and PennDOT SSO Division personnel, and FTA's review of investigations into near misses and safety events related to the RWP program that occurred in 2022 and 2023, FTA identified concerns regarding the capabilities of some QPEs to properly set up work zones to protect roadway workers. This issue was highlighted by a near miss that occurred during the SMI.

On the morning of September 12, 2023, a SEPTA contractor at 15th Street Station wrongly understood a track he was working on to be out of service and de-energized. A train was unexpectedly dispatched through the work area. While the worker was not injured, further investigation revealed a breakdown in communication between the QPE and the dispatcher as to which track was out of service and which was de-energized. The QPE did not properly request or follow standard procedures for taking the track out of service, de-energizing power, or working under another group's protection and failed to communicate the correct information to the SEPTA contractor.

Situations such as this near miss raise concerns regarding the quality of QPE training and certification programs, as well as the effectiveness of ongoing monitoring and evaluation of QPE performance. Proper QPE training and testing are crucial for ensuring roadway workers receive adequate on-track protections. Insufficient instruction places work crews at heightened - and unnecessary - risk in the rail transit environment.

Potential issues with training for QPEs identified during interviews with SEPTA and PennDOT SSO Division personnel include the following:

- **Inadequate initial training** – Initial training may fail to thoroughly cover the complex procedures and communications required to set up protections and may benefit from an additional focus on terminology, examples, and simulated scenarios.

- **Lack of hands-on practice** – Initial training may require additional hands-on practice to ensure QPEs develop the skills needed to correctly set up work zone protections in a variety of circumstances and locations in the rail transit environment.

- **Lack of detail in refresher training** – Refresher training may not be sufficient to ensure QPEs continued mastery of key safety concepts and protocols over time. New procedures also may not get conveyed or be included in training.

- **Weak testing/evaluation** – Exams and evaluation criteria may not be sufficiently comprehensive to ensure QPE comprehension of all pivotal safety duties to validate skills and readiness.

- **Inconsistent instruction** – Different instructors may interpret policies and best practices differently. Varied methods without standardization may lead to potential operational conflicts and safety issues.

In addition to potential training issues, FTA also assessed the evaluation and oversight needed to ensure newly certified and veteran QPEs appropriately establish on-track protection and communication. Without consistent oversight of QPE performance, there is a risk that bad habits, complacency, or declining skills could result in flawed application of safety protections. Weaknesses or gaps in protections expose roadway workers to dangers from moving trains, contact with live power sources, and other hazards.

During interviews, FTA confirmed that QPEs currently do not receive an annual field evaluation to ensure they have maintained their skills and mastered any new procedures or requirements reviewed through refresher training. Annual field evaluations would allow supervisors to formally assess each QPE's skills applying protections, communication practices, and rules knowledge. Declining performance can then be identified early and addressed through refresher training. Periodic spot checks on procedures would further bolster evaluations.

By conducting annual documented evaluations of each QPE, frontline supervisors can formally assess protection setup skills and knowledge retention. They can identify any declining performance early on and require refresher training. Spot-checking QPEs periodically for procedural compliance also supplements the annual process. Overall, diligent evaluation maintains the core competencies QPEs must possess to keep work crews safe on the tracks. Ensuring well-trained, proficient QPEs are in place promotes a culture of safety and helps prevent catastrophic incidents.

Required Action

Finding 1.4	**Qualified Protection Employees Need Additional Training and Routine Evaluation to Ensure Their Capabilities to Set Up Worker Protection**
Required Action 6	Within 60 days of issuance of this report, SEPTA must conduct an analysis of training, qualification, and routine evaluations provided to Qualified Protection Employees and develop an action plan and implementation schedule to ensure and continuously evaluate the capabilities of Qualified Protection Employees in setting up protections to provide transit worker safety in accordance with SEPTA's on-track safety program. SEPTA must submit the analysis, action plan, and implementation schedule to FTA for review, approval, and implementation monitoring.

Category 2 – Capacity of SEPTA's System Safety Division and Control Center to Ensure Safe Operations

This category focuses on the resources available for SEPTA's System Safety Division to lead the implementation of SMS Authority-wide, as required in Part 673, to respond to PennDOT safety oversight actions and to identify and address new and emerging safety issues. This category also addresses concerns with staffing and resources available in SEPTA's Operations Control Center (OCC), where instead of performing their main job function of supervision, Assistant Directors are required to dispatch bus and rail service, and dedicated resources are not available to support the controller training and qualification or the formal evaluation of controller and OCC performance.

FTA's SMI report issues two Findings and four Required Actions in this area.

Category 2 Finding 1. **Insufficient Resources in SEPTA's System Safety Division to Lead SMS Implementation, Address PennDOT Program Requirements, and Identify and Resolve New and Emerging Safety Concerns**

Background

SEPTA is one of the largest and most complex transit systems in the United States. It encompasses a wide range of services, including buses, trolleys, heavy rail, commuter rail, and more. Each of these modes of transportation comes with its own unique set of safety considerations and challenges. Managing the safety of such a multifaceted system requires a specialized and dedicated team.

SEPTA's System Safety Division plays a pivotal role in ensuring the safety and well-being of passengers and transit workers who rely on the SEPTA transit system every day. However, through the course of the SMI, it became increasingly evident that this division is significantly understaffed, and this shortage of personnel poses a serious challenge in addressing safety issues within the Authority and advancing its SMS.

The System Safety Division is divided into four departments:

- **Operational Safety** – Facilitates safety and hazard management programs across the organization to support safe operations and maintenance; interprets policy and administrative directives and supports the development and enhancement of SEPTA's Bus and Rail Transit ASPs, safety-related policies, directives, and programs; manages day-to-day coordination with Federal, Commonwealth, and local authorities; and establishes and educates transit workers on evacuation procedures, exit locations, and procedures for reporting safety concerns.

- **Accident Prevention and Investigation** – Investigate accidents and injuries to analyze events, identify hazards and deficiencies, propose mitigations and corrective actions,

and prepare final reports; conducts accident and incident trending; manages 24/7 on-call rotation; and handles all required regulatory reporting.

- **Occupational and Environmental Management Safety** – Implements safety, industrial hygiene, and environmental programs, protocols, and procedures; evaluates operations and physical plant for compliance with applicable regulations, standards, and practices; conducts assessments, audits, and inspections to evaluate occupational work practices and job characteristics to include industrial hygiene issues such as noise, air quality, personal protective equipment, ergonomics, and hazard communication; maintains database to house all Safety Data Sheets; manages the Environmental and Sustainability Management System; and coordinates and provides safety training for workers Authority-wide.

- **Construction Safety** – Institutes programs and protocols to minimize hazards related to construction; reviews project designs; conducts audits of construction projects to ensure safety regulation compliance; audits third-party and in-house force projects for safe work practices and procedures; and trains workforce on Occupational Health and Safety Administration regulations.

The System Safety Division has proposed a fifth department responsible for the implementation of SMS, the management of key safety data and analytics, and coordination with Executive Leadership, Labor, and PennDOT on SMS policy and procedures.

FTA's SMI team finds that SEPTA's System Safety Division has several important strengths, including the skill and knowledge of its leadership team, its data analytics capabilities, and the strength of its relationships with other SEPTA departments. Also, over the last year, the department has made gains in staffing, as the Chief Safety Officer worked to bring on board, train, and qualify seven accident investigators and two other analyst positions. As of December 2023, SEPTA's System Safety Division has 36 full-time positions to cover bus, streetcar, heavy rail transit, and FRA commuter railroad safety.

However, SEPTA's overall safety staffing lags considerably behind industry average for a system of its size and complexity. Transit peers, such as the Chicago Transit Authority, the Massachusetts Bay Transportation Authority, the Metropolitan Atlanta Rapid Transit Authority, and the Washington Metropolitan Area Transit Authority in Washington, D.C., have more than double the number of SEPTA's safety staff.

In addition, SEPTA's new SMS department is not yet formalized and contains just one dedicated full-time member. The SMS lead is a skilled veteran within the System Safety Division and, with staff shortages, is relied upon to fill many different roles and provide support across the department. These demands and the lack of an SMS organization and dedicated resources within the System Safety Division make it impossible to advance SMS within an Authority as large and complex as SEPTA. Previous staffing assessments required by PennDOT and shared with FTA indicate that SEPTA's new SMS section would require as many as 15 dedicated staff positions or contractor support to lead, coordinate, and manage SEPTA's SMS implementation.

This lack of resources significantly impacts SEPTA's SMS implementation. FTA reviewed SEPTA's SMS implementation approach and found it lacking in basic project management principles and actionable details. Without resources and dedicated support, it is challenging for the Authority to advance SMS implementation as specified in 49 CFR Part 673 and PennDOT's SSO program.

Further, in discussions and interviews, FTA finds that SEPTA leadership, from executives to supervisors, lacks a clear understanding of their roles in SMS. When discussing SMS, SEPTA officials provide general answers lacking detail and examples. SEPTA executives and managers do not understand how SMS processes are integrated into SEPTA's operations and maintenance and the critical role that data plays in supporting SEPTA's safety management processes.

While SEPTA is working to build its safety data management capabilities, the Authority relies heavily on corporate memory and experience rather than safety data analysis for decision-making. As discussed in other sections of this report, the Authority struggles to address safety issues in areas such as end-of-the-line operations, grade crossing and intersection management, and service planning due to lack of safety risk analysis tools and capabilities.

While SEPTA has improved its safety event investigation process, gaps remain in data collection and analysis, with operating departments failing to routinely collect safety data and with challenges in identifying probable causes and contributing factors. The System Safety Division faces challenges in accessing operational data, relying on manual entry from Control Center logs and other data sources, and outdated tools. Lack of integration between data sets leads to inefficiencies and inaccuracies, impacting the department's ability to analyze and report safety data effectively.

FTA also finds that the System Safety Division faces limitations in subject-matter expertise on key SMS elements. This lack of expertise makes it difficult to respond to new and emerging safety concerns using SMS tools and processes, especially safety risk assessments, safety performance measures, safety assurance audits, and continuous improvement initiatives.

Further, SEPTA has not been able to meet the requirements of PennDOT's SSO program with on-time and quality deliverables. While the Authority is working to build capacity in accident investigation, management of CAPs, and the conduct of internal safety audits, inspections, and reviews, additional resources are necessary to ensure these critical capabilities in the System Safety Division.

With limited personnel resources, SEPTA's System Safety Division has identified initiatives to enhance effectiveness and support SMS implementation. These include:

- facilitating SEPTA's Safety Committee structure and Joint Labor-Management safety initiatives,

- working divisions to establish formalized audit/quality-control processes to evaluate compliance with key safety rules,

- conducting worker safety attitude workshops,
- evaluating safety management software applications,
- publishing monthly safety performance reports,
- improving coordination with the Asset Management process and applications and
- conducting a worker safety culture survey and sharing results Authority-wide.

SEPTA's System Safety Division also has undertaken actions to maximize what it can accomplish with its limited personnel resources, including:

- cross-training System Safety staff to expand their safety knowledge;
- exposing System Safety staff to collaborative team initiatives outside of their safety responsibilities, such as working with Asset Management or audits led by other departments;
- providing leadership development training to System Safety staff;
- providing opportunities for staff to obtain safety training and industry certifications (Certified Safety Professional, Certified Industrial Hygienist, etc.); and
- incorporating succession planning and mentoring opportunities for staff.

While FTA acknowledges these initiatives, FTA finds that with its limited resources, SEPTA's executive leadership team has not ensured that the necessary resources and structures are in place to support effective implementation and operation of its SMS. Per 49 CFR § 673.21, FTA requires each transit agency to establish and implement an SMS tailored to the size, complexity, and scope of the transit agency and the environment in which it operates. With so many operating and maintenance divisions, modes of transit, and over 9,000 workers, SEPTA's SMS effort and safety programs must be robustly resourced and supported at the highest level of the organization to manage the Authority's transition to this safety management approach.

Required Action

Finding 2.1	**Insufficient Resources in SEPTA's System Safety Division to Lead SMS Implementation, Address PennDOT Program Requirements, and Identify and Resolve New and Emerging Safety Concerns**
Required Action 1	Within 60 days of issuance of this report, SEPTA must revise its System Safety Division workforce assessment to focus on SMS implementation, including needed improvements in Safety Risk Management and Safety Assurance activities, compliance with PennDOT SSO program requirements, and SEPTA's capacity to address new and emerging safety issues. The workforce assessment also must address formalizing and fully staffing SEPTA's new SMS department within the System Safety Division to expedite SEPTA's SMS implementation and submit the workforce assessment to FTA for review and approval. Within 30 days of FTA approval of the analysis, SEPTA must develop an action plan and implementation schedule to address the results of the workforce assessment and submit to FTA for review, approval, and implementation monitoring.

Category 2 Finding 2. **SEPTA's Control Center Is Not Resourced to Meet Service Levels, Has No Dedicated Training Function, and Does Not Use Industry Standard Rules Reviews and Scenario Testing Activities**

Background

SEPTA's OCC houses the controllers, supervisors, and managers who coordinate all rail and bus transit vehicle movements throughout the system. OCC personnel monitor the entire fleet, communicate schedules and service changes with vehicle operators, coordinate responses to disruptions, and manage incidents. Performing these safety-sensitive functions requires experienced, alert, properly trained, and qualified controllers working within designated hours-of-service (HOS) limits.

<u>OCC Personnel Resources</u>

Through in-depth interviews, site visits, and OCC observations, and document and data reviews, FTA finds that SEPTA's OCC is operating significantly below its budgeted staff positions. This situation requires forced overtime from available controllers to cover shifts, and often results in Assistant Directors, who should be supervising the OCC, dispatching service. It also requires trainees, with a trainer present in the OCC, to cover shifts designed for fully qualified controllers.

Insufficient staffing within a rail or bus transit control center introduces risks that can directly impact safety within the transit environment. When there are too few controllers to cover the scope of responsibility across operating shifts, the remaining staff often end up working

unpredictable overtime. Unpredictable and long working hours can result in fatigue, loss of situational awareness, and delayed reactions that undermine safe decision-making and communication in normal and emergency situations.

Under resourcing also hampers the ability of the OCC to dedicate staff time to core safety assurance functions like rules compliance monitoring, operational testing, oversight of corrective actions, and ongoing controller skills evaluation and training. Instead, most resources get channeled to the basic task of monitoring and directing daily transit operations. Further, lack of personnel to dispatch and supervise service during off-peak periods may leave the Authority unable to safely manage response to accidents, emergencies, weather-related events, and abnormal occurrences that occur during these periods.

Table 3 below presents the current staffing for SEPTA's OCC.

Position	Headcounts		Staff Qualification Status
	Budgeted	Actual	
Director	1	1[12]	Fully qualified
Assistant Directors			
Rail Transit	4	4	Fully qualified
Bus Transit	4	4	Fully qualified
Control Center Controllers			
Bus Transit	19	17	Fully qualified
Subway/Elevated	10	9	4 Fully qualified 5 In training
Light Rail	9	6	4 Fully qualified 2 In training
TOTAL	**47 budgeted**	**41 actual**	**34 fully qualified OCC staff**

Table 3. SEPTA OCC Staffing and Qualification Levels as of January 31, 2024

This table shows that, as of January 31, 2024, to dispatch the BSL and MFL desks (or Subway-Elevated), for three shifts and 24/7 coverage, SEPTA has budgeted ten positions, four of which are filled with fully qualified controllers, five of which are filled with controllers-in-training, who are not authorized to dispatch alone, and one position remains vacant.

Likewise for trolley and NHSL dispatch (referred to as Light Rail dispatch in the OCC), SEPTA has nine budgeted headcounts, four of which are filled with fully qualified controllers, two of which are in training and cannot dispatch alone, and three positions are vacant. Finally, for bus transit, SEPTA has a budgeted headcount of 19, with 17 fully qualified controllers and two vacancies.

[12] As of January 31, 2024, there are two Directors, one dedicated to rail transit and one dedicated to bus transit.

SEPTA's rail transit control center has been designed to operate with two controllers per shift on the BSL-MFL desk and two controllers on the Light Rail/NHSL desk for all three shifts. However, given staffing challenges, SEPTA has reduced the level of staffing on the overnight shift, dropping to one controller for the BSL-MFL and one controller for Light Rail/NHSL, operating below its designated staffing level. PennDOT previously required SEPTA to create a CAP to fully staff the overnight shift to ensure the safety of SEPTA's overnight operations. While SEPTA was able to increase staffing and close the finding before the COVID pandemic, since that time, staffing the overnight shift to required levels has re-emerged as an even more significant challenge.

Table 3 shows an almost 16 percent vacancy rate in controller positions, which is further exacerbated by the staffing plan for the OCC, which is designed to cover all holidays, vacations, and sick time with overtime, as opposed to dedicated relief personnel. This staffing approach multiplies the impact of the vacancy rate.

Assistant Directors Dispatching Service

The four Assistant Directors at SEPTA's rail transit OCC routinely dispatch service, leaving them performing multiple roles: dispatching service, training new dispatchers and controllers, and overseeing operations. During the SMI, FTA confirmed that during PennDOT's biweekly inspections of the OCC, over half the time, an Assistant Director was covering at least one desk on subway-elevated and one Light Rail/NHSL desk. Similarly, during FTA's SMI observation of the OCC, an Assistant Director was observed relieving a light rail controller to take a shift.

FTA finds that it is problematic for Assistant Directors in the OCC to also dispatch service routinely. Assistant Directors are tasked with critically monitoring dispatcher activities, ensuring compliance with rules and procedures, providing performance feedback, and leading regular skills assessments. Having Assistant Directors simultaneously perform dispatcher duties undermines safety oversight responsibilities and contributes to excessive working hours.

Taking on active dispatch roles reduces the Assistant Director's capacity to observe and coach subordinate staff. It can also lead to inappropriate levels of multitasking, where an Assistant Director is overseeing operations at a high level while also responding to calls and directing transit traffic. This divided set of duties raises the risk of errors occurring and safety issues being overlooked.

Additionally, Assistant Directors subject themselves to mental fatigue and diminished situational awareness when working extensive overtime to fill open dispatcher shifts. The safety impacts of long working hours are amplified for individuals in oversight roles. Transit control centers typically maintain clear separation of tasks between dispatching operations and managing and assessing safety performance. Dedicated dispatcher staffing allows Assistant Directors to focus fully on their safety assurance responsibilities.

Because rail Assistant Directors are pulled into dispatching weekday and weekday overnight hours to address the staffing shortage, there is limited weekend coverage possible with

Assistant Directors and limited supervision in the OCC during this period. During the SMI, FTA confirmed that there was no weekend rail Assistant Director coverage in SEPTA's OCC.

Rules Compliance and Performance Evaluation

With its lack of staffing, SEPTA also is not able to use industry standard rules reviews and scenario testing activities.[13] to assess dispatcher and controller performance. During SMI discussions, FTA identified that the Control Center does not fall under the same rules compliance program as other SEPTA divisions.

The ProntoForms rules compliance application, used by other SEPTA departments, was scheduled for implementation within the OCC but has not yet been implemented. While workers mentioned that a standalone process is in place, it is not documented in the *Operations Division 2023 Transit Rail Rules Compliance for Subway/Elevated Suburban Rail & Light Rail Transportation User's Manual* (January 1, 2023) as having mandatory monthly tests. Moreover, given staffing shortages, Assistant Directors are unable to conduct rules compliance observations as well as rules reviews, scenario testing[14], and performance reviews of the rail controllers.

Rules reviews, scenario testing, and performance evaluations of rail controllers are critical for several key reasons:

- **Ensures Comprehension of Evolving Rules and Procedures** – Regular reviews provide opportunities to verify comprehension and proper application of rules, technology changes, terminology, emergency contacts, etc. This helps avoid unsafe assumptions or knowledge gaps.

- **Validates Skills Application in Challenging Scenarios** – Testing aptitude in realistic, complex simulations shows controllers can make quick, accurate decisions essential for safe operations, versus just paper policy comprehension.

- **Reinforces Vigilance over Time** – Documented competency checks safeguard against developing bad habits over years on the job. They counteract complacency and unsafe habits through positive accountability.

- **Identifies Performance Gaps Requiring Intervention** – Structured performance reviews facilitate early detection of individual weaknesses like use of improper radio terminology or protocol, following improper procedures, and poor situational awareness. Targeted training can then upgrade subpar skills before mistakes occur resulting in safety events.

[13] See APTA-RT-OP-S-005-03 Rev 3, "Operations Control Centers" (July 6, 2018).

[14] Scenario testing refers to assessing skills and decision-making abilities by presenting OCC personnel with simulated emergency or unusual operational situations in a control center environment and asking them to demonstrate response.

- **Correlates Individuals to Operational Safety Trends** – Tying evaluations to broader safety performance metrics pinpoints if those struggling pose wider safety risks, guiding prioritization of retraining efforts for maximum safety impact.

Diligent confirmation of rail controller and dispatcher capabilities provides assurance they can maintain safe transit operations as situations rapidly develop each day. Lapses in judgment or errors can instantly cascade into significant safety consequences. Proper oversight safeguards competency levels to minimize preventable incidents.

Lack of Dedicated Trainer

SEPTA's OCC also does not have a dedicated trainer for the control center, which places additional responsibilities for training on Assistant Directors and controllers. SEPTA requires almost one year of training to become qualified as a controller for rail transit service.

Controllers must understand the book of rules, physical characteristics of their territories, standard operating procedures, and emergency operating procedures. Controllers also train for four weeks on each of the three shifts in the Control Center. While not as extensive, bus transit controllers require a 14-week training program and procedures refresher training after three months on duty. Without a dedicated trainer, qualified controllers and Assistant Directors must provide on-the-job training.

The complex knowledge and specialized skills required for rail dispatching and bus transit control warrant significant upfront and ongoing training conducted by qualified instructors. SEPTA's OCC controllers carry immense responsibility for monitoring operations, communicating with vehicle operators, and coordinating incident response across a vast transportation network.

SEPTA relies on controllers and supervisors to carry out training for new hires in a train-the-trainer model. This approach overburdens staff who already work demanding shifts directing daily operations. It can result in inconsistent development and evaluation of controller competencies. Further, SEPTA's OCC currently has seven controllers currently in training and three more hires underway. Interviews confirmed that due to the difficulty of working as a controller, SEPTA experiences considerable turnover and is in a constant state of training.

Dedicated OCC training staff play a vital role in ensuring safety. They standardize instructional plans to align with current rules and procedures. They assess and document the progress of controllers in training. They identify knowledge gaps and opportunities to improve training. And they focus completely on the growth and preparedness of new staff, without the distraction of simultaneously performing operational dispatch duties or supervision.

Investing in skilled trainers for control center roles allows transit agencies to instill safety behaviors from day one and ensure controllers are fully prepared before being independently responsible for service coordination. The depth of experience needed to orchestrate transit operations requires an equivalent commitment to resourcing training programs.

Required Action

Finding 2.2	**SEPTA's Control Center Is Not Resourced to Meet Service Levels, Has No Dedicated Training Function, and Does Not Use Industry Standard Rules Reviews and Scenario Testing Activities**
Required Action 2	Within 60 days of issuance of this report, SEPTA must conduct a workforce assessment regarding personnel resources in the rail and bus transit OCCs required to dispatch, supervise, and ensure safety of fixed-route bus and rail transit service and submit to FTA for review and approval. Within 30 days of FTA approval of the assessment, SEPTA must develop an action plan and implementation schedule to address its findings. FTA expects that SEPTA may have to adjust service levels or engage in hiring to address the results of this assessment. SEPTA must submit this action plan and implementation schedule to FTA for review, approval, and implementation monitoring.
Required Action 3	Within 90 days of issuance of this report, SEPTA must establish a formal evaluation program for dispatchers and controllers. SEPTA must consider incorporating industry standard rules reviews and scenario testing activities to assess the performance of its dispatchers and controllers. SEPTA must submit this program to FTA for review, approval, and implementation monitoring.
Required Action 4	Within 120 days of issuance of this report, SEPTA must develop an action plan and implementation schedule to establish dedicated training resources for rail and bus transit controllers at the Control Center. SEPTA must submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.

Category 3 – Bus and Rail Transit Safety Issues Contributing to Safety Events

FTA reviewed the resources available to support the safe operation and maintenance of SEPTA's legacy bus and rail transit system. FTA assessed the adequacy of SEPTA's HOS and fatigue management policies to ensure operational safety. FTA also assessed the safety impacts of recent staff reductions, including the loss of supervisors and training instructors to resignations, terminations, and retirements. FTA examined the extent to which new operators contributed to safety events occurring on the system and the resources available to support them in operating as safely as possible. FTA examined SEPTA's training materials and records to evaluate the effectiveness of SEPTA's safety training programs for transit workers. FTA also assessed how well transit operators are evaluated, coached, and mentored to improve safety performance. FTA evaluated SEPTA's coordination with State and regional agencies to improve on-road safety at key intersections and crossings and to improve detour management. FTA

looked at how SEPTA monitors service design that puts operators in difficult or unsafe positions and assesses safety impacts of specific policies for operator safety, including the use of overnight shifts and requiring dual certifications in trolley and bus operation in the Victory District. Finally, FTA reviewed and observed pre-trip inspections and radio operations on the SEPTA system.

The SMI identified 10 Findings and 14 Required Actions related to safety issues for SEPTA fixed-route bus (excluding trackless trolley) and trolley transit modes.

Category 3 Finding 1. High Fa gue Environment for Rail and Bus Transit Workers

Background

FTA's SMI highlights that SEPTA's staffing crisis is causing excessive overtime, which leads to operator fatigue and decreased alertness. This raises the risk of accidents while operating heavy vehicles in complex environments, potentially endangering passenger and worker safety.

SEPTA faces a persistent shortage of transit workers. The Authority's workforce is 8-12 percent below the budgeted levels in most districts and divisions, prompting reliance on overtime and mandatory work assignments, called drafting. This results in a fatigued workforce, especially among those performing safety-sensitive functions[15] such as vehicle operators, supervisors, control center staff, and maintenance personnel. The absence of reserve or relief personnel compounds the problem, as holidays, vacation, sick, and leave time currently also are covered with overtime, exacerbating the impacts of the staffing shortfall to 15-25 percent on some days in certain districts and divisions.

To mitigate this situation, SEPTA has cut its weekday bus service by 10 percent from 2019 to spring 2023. Additionally, the MFL has seen a reduction in the number of trains, operating with 8 to 12 trains instead of 16, to balance vehicle availability and staffing limitations. Despite these measures, FTA interviews with operations leadership and frontline workers indicate that SEPTA may still be overextending its resources, and potentially compromising safety. FTA also finds that SEPTA does not implement industry-leading hours of service and fatigue management practices.

SEPTA HOS Standards

At present, there are no Federal minimum standards for HOS and fatigue risk management programs (FRMP) in the transit industry. Limiting HOS reduces excessively long work hours, while FRMP address other workplace factors impacting fatigue, such as training and work scheduling. FTA issued an Advance Notice of Proposed Rulemaking on Transit Worker Hours of Service and Fatigue Risk Management on October 30, 2023.[16]

[15] See 49 CFR § 655.4 "Safety-sensitive function."

[16] See the Advanced Notice.

Rail Transit Operations and Maintenance

SEPTA's HOS requirements for rail transit operations personnel, specified in SEPTA's HOS procedure,[17] allow rail transit operations workers and supervisors to work up to 16 hours, with eight hours off in between shifts and no limits in the number of days worked in a row.

The procedures also allow rail transit workers to be drafted to work up to 16 hours until relieved, at least once per month. Based on review of work schedules, these requirements typically result in some SEPTA rail transit operators, supervisors, controllers, maintenance technicians, and other safety-sensitive personnel working six days a week for between 8 and 12 hours per day, with an occasional 15- to 16-hour day. While FTA did not find evidence of transit workers working 10 or more days in a row, it would be allowed under SEPTA's HOS policy.

SEPTA's HOS requirements for rail transit personnel do not align with recommendations to FTA for rail transit safety-sensitive positions from the NTSB[18] or with recommendations to the rail transit industry from the American Public Transportation Association (APTA),[19] which both recommend no less than ten hours in between shifts for rail operations personnel, to provide for the opportunity of eight uninterrupted hours of sleep, and which also specify limits on the number of consecutive days worked.

APTA's consensus standard for rail transit operators, which has been adopted as an effective practice at other transit agencies, limits maximum operating hours to 12 hours, with a maximum duty day of 16 hours. APTA's consensus standard suggests that train operators have a minimum off-duty time of 10 hours and a maximum period of seven consecutive workdays.

The requirements listed in the 2023 HOS procedure are an improvement from the 2022 ASP, which allowed an 18-hour shift, with no more than 30 hours worked in two days, and did not include a mandatory 8-hour rest period between shifts. PennDOT has been working with SEPTA on this HOS update for rail transit operations (to no more than 16 hours worked and no less than eight hours between shifts) dating back to the late 1990s.

While FTA recognizes that this change constitutes some progress, review of work schedules and interviews with frontline workers, supervisors and managers throughout the rail transit operation reveal an exhausted workforce, frustrated with work scheduling practices that give them so little rest while providing rail transit service for SEPTA's passengers.

It should be noted that SEPTA complies with FRA's HOS requirements for its commuter rail service, which is not the subject of FTA's SMI. Contained in 49 CFR Part 228, FRA's requirements specify a maximum time on-duty for commuter rail operations personnel (may not exceed 12 consecutive hours for train employees) and a mandatory off-duty time (minimum of 10

[17] See SEPTA Hours of Service Program: Bus and Rail Transit Operations, (October 10, 2023).

[18] See NTSB RAR–06/01 "Collision Between Two Washington Metropolitan Area Transit Authority Trains at the Woodley Park-Zoo/Adams Morgan Station in Washington, DC" (November 3, 2004).

[19] See APTA RT–OP–S–015–09 Rev 1, "Train Operator Hours-of-Service Requirements" (June 7, 2019).

consecutive hours off duty after exceeding 12 hours on duty for train employees). SEPTA also has an FRA-compliant FRMP in place for its commuter rail operations.

Bus Transit Operations and Maintenance

SEPTA's bus transit operations implement the same HOS service standard as rail transit (up to 16 hours worked with eight hours off in between shifts and no limits in the number of days worked in a row). Bus transit workers also may be drafted to work up to 16 hours until relieved at least once per month.

Review of work schedules and discussions with bus transit operations and maintenance personnel also indicate that many SEPTA workers work six days a week. In the bus OCC, for example, due to staffing levels, with only 17 of 19 positions filled, interviewed bus controllers are concerned about violating this policy, and typically work 6 days per week, with 8- to 12-hour shifts, with occasional 14- and 16-hours shifts.

In another example, SEPTA records from January 2022 to June 2023 show that Victory District bus operators logged from 14 hours to 15 hours and 59 minutes (one minute short of the maximum on duty time) 913 times, and four operators logged 16 hours. While no HOS limits were violated on any of these 917 occasions, these numbers indicate the amount of overtime being worked in a single district.

This bus transit operations HOS standard has been designed to address a waiver granted by the Pennsylvania Secretary of Transportation in response to a petition filed by SEPTA, the Port Authority of Allegheny County, and the Pennsylvania Public Transportation Association. The Secretary issued this waiver of certain HOS regulations that apply to holders of commercial driver licenses (CDL), including commercial truck and bus drivers, specifically for public transit bus drivers.

The original waiver was granted in 2013, with the expectation that new state regulations specific to public transit would be developed to replace the waived Federal rules. But after 10 previous short-term extensions, no new state regulations have been finalized. The PennDOT Secretary of Transportation provided another waiver extension, most recently on July 27, 2023.

This action waives the applicability of 67 Pa. Code § 231.7(7), which incorporates 49 CFR Part 395 (relating to HOS), to public transportation drivers. These requirements specify that commercial drivers have daily driving limits (a maximum of 11 hours after 10 consecutive hours off duty and may not drive beyond the 14th consecutive hour after coming on duty) and weekly limits (may only drive 60/70 hours in 7/8 consecutive days [trucking/non-trucking operators] and may drive only 8 hours without at least a 30-minute break).

Without nationwide HOS standards for transit, the Commonwealth, following a trend seen in other states, has waived these requirements for public transit operators holding CDLs, allowing SEPTA and other transit agencies in the Commonwealth to develop their own standards. In consideration for the creation of these standards, FTA notes that workers with regular 8- to 10-

hour shifts that start at the same time every day generally have sufficient time to rest between shifts. However, adequate sleep becomes challenging when workers work overtime with 8 hours or less of off-duty time before their next shift. To achieve a full 8 hours of sleep, a transit worker needs significantly more than 8 hours off-duty to allow for travel, family obligations, and personal care.

Impacts of Overnight and Late Shifts

During the SMI, bus transit leadership explained that new-hire bus operators typically receive the least desirable shifts after completing training due to a lack of seniority. Since SEPTA provides 24-hour bus service, new operators are often left with overnight and/or late shifts, typically the more challenging to operate from a safety perspective. These types of shifts also introduce a higher risk to operator fatigue and have limited supervisors available to support operators.

Interviews with SEPTA bus operations management indicated that reducing the number of overnight or late shifts could potentially decrease the risk associated with fatigue issues. The 12:00 am-9:00 am "night liner" shift is the most challenging and stressful for any operator. Operator fatigue is greatest at the end of a shift and when that coincides with the morning rush hour, this may increase the likelihood of accidents and incidents. In discussions with FTA, SEPTA bus operations management indicated that adjusting the "night liner" shift from 8:00 pm-4:00 am, for example, could help avoid rush hour fatigue and reduce associated safety risk. FTA's SMI finds that a thorough analysis of the use of overnight or late shifts for bus and rail operators, and their impacts on operators and operations safety, is necessary to determine action for improvement.

Trapeze HOS Tracking and Monitoring

SEPTA's Trapeze system enforces HOS rules for bus and rail transit operators, and for other safety-sensitive workers, ensuring no one works over 16 hours per shift and receives at least eight hours of rest between shifts. This system offers SEPTA considerable control in how it schedules workers and manages overtime assignments.

For example, both rail and bus operators are categorized by district, for additional tracking and management capabilities. Operators clock in by swiping their ID, which sets their on-duty time, with a 59-second window allowed around their start time. Trapeze prohibits scheduling without the mandated rest period, although operators may bid on conflicting schedules, requiring dispatchers to adjust the shifts to comply with rest requirements. Alerts are sent if an operator reaches 14 hours of duty. The system provides printed receipts for operators and allows managers to send messages or lock out swiping to ensure communication before a shift. Managers cannot alter HOS requirements in Trapeze.

Required Action

Finding 3.1	**High Fatigue Environment for Rail and Bus Transit Workers**
Required Action 1	Within 90 days of issuance of this report, SEPTA must develop an action plan and implementation schedule to conduct a comprehensive review of SEPTA's policies and practices for managing the work hours and fatigue of rail and bus operators and maintenance workers. This review must examine SEPTA's current hours of service requirements, overtime regulations, labor agreements, policies on secondary employment, as well as medical review and clearance policies and fatigue management strategies. It should also assess current SEPTA practices related to scheduling work hours and overtime for these workers. SEPTA must submit the review to FTA for review and approval. Within 30 days of FTA approval of the review, SEPTA must modify its work scheduling system to ensure it provides rail and bus operators and maintenance workers with predictable work and rest cycles that consider human circadian rhythms, as well as sleep and rest needs. SEPTA must submit the action plan, implementation schedule and revised work scheduling protocols/system to FTA for review, approval, and implementation monitoring.

Category 3 Finding 2. **Ratio of Supervisors to Operators Creates Challenges in Overseeing Safety-Sensitive Activities in Passenger Service**

Background

SEPTA's operation supervisors play a crucial role in managing safe service delivery across all transit modes. They oversee the safety of operators' day-to-day performance, ensuring they follow schedules, routes, safety rules, and Authority procedures. Supervisors conduct field observations and safety checks, respond to incidents and accidents, and act as liaisons between different departments to resolve issues in service, such as disabled vehicles or malfunctioning equipment. They also review performance data, address customer complaints, and assist with operators' professional development. Finally, supervisors at SEPTA participate in the Authority's discipline process.

During the SMI, as discussed later in this report, FTA confirmed that a significant number of major safety events on the SEPTA system over the last three years involved new operators with less than three years of experience. FTA also found that many of these new operators were leaving SEPTA at a high rate, with the number of exiting operators rising from 80 in 2019 to 168 in 2023. SEPTA also reported that new operators experience the most terminations related to violations of safety rules and procedures.

Interviews with new operators, veteran operators, and SEPTA bus and rail transit leadership all indicate that a shortage of supervisors in the field contributes to this situation. Lack of supervisors means operators may be on their own in responding to situations; may receive delayed response to emergency situations; and may receive limited attention or coaching to build operating skills and correct unsafe practices and behaviors.

With current staffing levels, SEPTA supervisors must prioritize responding to the most serious problems in service and may not have time for other duties. During the SMI, FTA learned that for subway-elevated service (MFL and BSL combined), there were 19 active supervisors, with three additional supervisors in training, for 24/7 coverage, to supervise 83 operators on the BSL and 72 operators on the MFL. During a typical shift, there were three supervisors covering the entire MFL/BSL service, including approximately 40 operators, dozens of aging trains and tens of thousands of passengers, an operator-to-supervisor ratio of 13:1. Before COVID and recent staffing shortages, SEPTA aimed to have double that number of supervisors on each shift, for an operator-to-supervisor ratio of approximately 7:1. At the time of the SMI, SEPTA was in the process of hiring an additional 20 supervisors.

For bus operations, during the SMI, SEPTA indicated they had 84 supervisors for bus (74 City, 10 suburban) and 17 supervisors for the Victory district, which includes both bus and trolley operations. Collectively, these approximately 100 supervisors are responsible for almost 2,200 bus and trolley operators providing roughly 1,500 daily runs over the 2,200 square mile system from eight different divisions. For each of the three shifts, 24-7, on a typical day, SEPTA has between 20 and 30 supervisors covering its entire bus operation, an operator-to-supervisor ratio between 15:1 and 25:1, depending on district. SEPTA leadership also indicates that supervisors are 10 to 20 percent understaffed, depending on location, but this lack of staffing is exacerbated by the lack of relief supervisors, as all holidays, sick time and vacation for the existing supervisors are covered through supervisor overtime.

There are no universal standards for ideal supervisor to operator ratios in public transit systems, though basic guidance for worker-to-supervisor ratios in State and local agencies typically falls between 5:1 (incident management and emergency response)[20] and 10:1 (standard organizational structure)[21], with lower ratios (more supervisors) for less experienced workgroups, including trainees and operators in their first 12 months. Environmental factors also play a role. More supervisors may be warranted for larger fleets, extended geographic coverage, complex service environments, and high turnover groups.

With ratios of between 15:1 and 25:1 in bus transit, depending on district, SEPTA supervisors must prioritize their activities, and do not have the time to engage with new operators as they may have done prior to COVID, under different staffing ratios. Instead of conducting robust observations, audits, and operator coaching focused on ensuring knowledge of safety rules, demonstrating safe vehicle operation, and preventing safety issues, most of their day is

[20] See Federal Emergency Management Agency information on manageable span of control.

[21] See McKinsey & Company information on spans of control.

consumed with resolving problems after they occur. Supervisors also must spend time on secondary tasks, such as posting service notices, issuing citations to vehicles blocking the bus-only lanes, and working with the City Parking Authority to remove vehicles illegally blocking the bus-only lanes. These activities, while crucial for system service, take time away from working with new operators.

According to interviews at all levels of the organization, supervisor visibility in the field to manage the line, conduct bus operator onboard performance evaluations, work one-on-one with operators, and help deter security incidents by providing a uniformed presence and second SEPTA official on a vehicle or at a transit center, has been significantly limited by staffing challenges over the last few years. The impact of supervisor shortages is amplified during off-peak periods when there are fewer total staff across the transit system and when more new operators are providing service.

The supervisor shortage leaves a hole in SEPTA's organizational foundation, lessening safety oversight across transit operations. Without adequate supervisor staffing, the Authority struggles to maintain line-of-sight into frontline activities across sprawling service territories. This sparse coverage hamstrings SEPTA's ability to get ahead of safety risks before they materialize into incidents. Overburdened supervisors cannot spearhead robust hazard identification, risk mitigation, operator coaching, rules compliance audits, performance evaluation, and other core safety management processes.

FTA finds that SEPTA must examine the adequacy of its ratio of supervisors to operators. Without sufficient levels of supervision, new operators with safety skill deficits and veteran operators with fading skills may not be proactively identified and coached before accidents occur. Enhanced levels of supervision also facilitate monitoring and coverage across operating shifts to catch safety potential issues unfolding in real-time. Supervisors also provide crucial command presence during major disruptions to guide emergency response. Rectifying current deficiencies is paramount for executing transit service delivery safely, reliably, and responsibly.

Required Action

Finding 3.2	**Ratio of Supervisors to Operators Creates Challenges in Overseeing Safety-Sensitive Functions in Passenger Service**
Required Action 2	Within 90 days of issuance of this report, SEPTA must assess the current ratio of supervisors to transit operators in its fixed-route bus, trolley, and heavy rail operations and submit the assessment to FTA for review and approval. Within 30 days of FTA approval of the assessment, SEPTA must develop an action plan to ensure adequate oversight for those transit operators performing safety-sensitive functions. SEPTA must submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.

Category 3 Finding 3. Training Program Does Not Ensure the Readiness of New Operators for Transit Service

Background

SEPTA rail and bus instructors are personnel who have operational experience on the modes they are teaching and follow standard "training grids" which outline modally-specific training syllabi. All instruction includes classroom, line, and "wildcat" (in-service) training. SEPTA has an established learning management system accessible by all SEPTA workers for tracking and management of workforce training.

Interviews and reviews of training schedules, work schedules, and learning management system data show that existing instructors work six to seven days per week but remain unable to complete all core duties, which include training new operator recruits, providing refresher training, recertification training, and remedial training, as well as provide regular trainee "on-vehicle performance testing" of skills learned. This also means that existing instructors are unable to keep up on their own training needs and are facing "burnout" at the current work rate. The Operations Training group currently has 63 total instructors to provide initial and refresher training and performance evaluations for approximately 2,500 bus and rail operators. The Bus and Rail Operations Training Group has requested 40 additional instructors. At the time of the SMI, 12 new positions had been approved.

Insufficient instructor resources directly translate to compromised safety in several ways. First, interviews revealed that, due to tight training scheduling, new operators may be released to revenue service before attaining full proficiency. While trainees receive their scheduled class time, there is no more time available if additional training is needed to help make them ready for service and SEPTA's 2023 "washout" rate for new operators was 22 percent. Interviewees reported that some new operators are not confident in their ability to safely handle vehicles safely when leaving training. Interviews indicate that that with more time and resources to devote to these classes, SEPTA may be able to help some of these new operator trainees qualify for service and ensure the readiness of all passing operators for service.

Second, instructor shortages slow certification and hiring of additional operators needed to deliver service. Waitlists for Bus Operations training deter prospective candidates from joining SEPTA and waitlists for Rail Operations training hinders SEPTA workers ability to transfer from Bus to Rail Operations. Instructors do not have time to perform routine "on-vehicle" evaluations of operator skill competency and work with veterans to combat knowledge and skill fade.

Additionally, the lack of instructors hampers opportunities for skills reinforcement, remedial education, and refresher courses to maintain operator qualifications over time. Evaluations to gauge training efficacy and pinpoint knowledge gaps are also minimized. This inability to support operators throughout their career amplifies safety risks.

Finally, exhaustive instructor workloads and lack of depth create single points of failure. Loss of just a few personnel would bring training programs to a halt. Expanding instructor ranks is vital for delivering reliable, standardized instruction and evaluating the competencies of new staff.

Additional obstacles for bus and rail training include a lack of locations to run training classes and the need to work with Operations to have buses available for trainees to use.

Resourcing adequate instructor roles is imperative for standardizing and expediting operator instruction, upholding wash out performance gates, identifying skill gaps quicker, and allowing coaching versus discipline of struggling veterans.

Required Action

Finding 3.3	**Training Program Does Not Ensure the Readiness of New Operators for Transit Service**
Required Action 3	Within 120 days of issuance of this report, SEPTA must conduct an analysis of the adequacy of training resources and submit to FTA for review and approval. Within 30 days of FTA approval of the analysis, SEPTA must develop an action plan and an implementation schedule to address deficiencies noted by FTA. The analysis must review resources available to ensure new operators are not released into revenue service before they are ready, that they are equipped to manage the service environment, completion of all required retraining for every operator who needs it, and completion of regularly scheduled performance evaluations for each operator. SEPTA must submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.

Category 3 Finding 4. **SEPTA Does Not Conduct Regular Performance Evaluations for Transit Operators**

Background

To qualify as a SEPTA bus operator, candidates must have at least 3 years of licensed driving experience with no more than one moving violation and no license suspensions in the 3 years prior to their hiring. They must hold a valid license without any revocations in the past 5 years. Candidates also need a high school diploma or equivalent, ability to work variable shifts including weekends and holidays, and clearance on background checks, assessments, and a medical exam, including a drug screening. Finally, they must obtain a Class B CDL with passenger endorsement and without air brake restrictions within at most two weeks prior to their start date.

After completing bus operator initial training, SEPTA bus and trolley operators must complete the CDL certification renewal every three years and complete annual refresher training. However, FTA's SMI team learned that SEPTA does not provide each operator with a formal performance evaluation each year to assess their skills and capabilities to safely operate a transit vehicle in service and to evaluate their knowledge of SEPTA's safety rules.

SEPTA data shows that 47 (34 percent) of the 138 major bus collisions in 2023 involved operators with three or fewer years of experience. Further, 53 percent of those collisions involved operators with less than one year of experience. SEPTA data also shows that 24 (53 percent) of major trolley collisions involved operators with three or fewer years of experience. Further, 50 percent of those collisions involved operators with less than one year of experience.

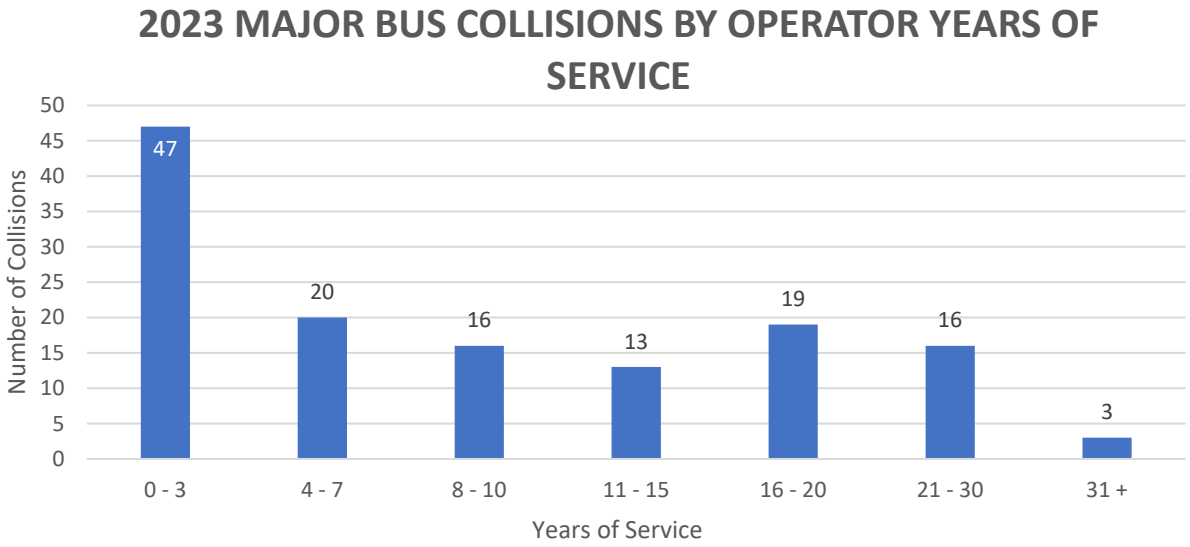

Figure 6. 2023 Major Bus Collisions by Operator Years of Service

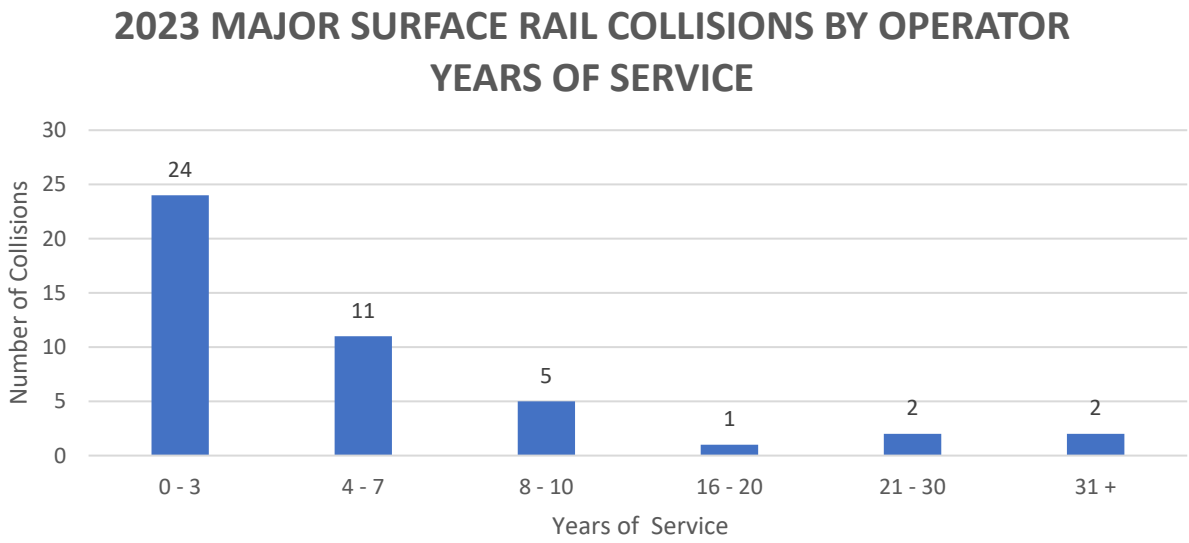

Figure 7. 2023 Major Surface Rail Collisions by Operator Years of Service

Without recurring onboard evaluations of individual operators paired with coaching and skills development, deficiencies in following safety protocols, adherence to safety rules and quality standards, and overall safe operating skills may not be promptly identified and corrected. For example, SEPTA supervisors conduct limited ride-checks every 6 months and mainly in response to complaints versus proactively assessing skills and safety performance. Further, undercover rides and wayside checks, while helpful, do not substitute for formal onboard evaluations and training. Although SEPTA's annual trolley operator recertification program includes an evaluation of skills, FTA determined that SEPTA's trolley operations has no standardized practice for operator performance evaluations conducted yearly to assess their capabilities to safely operate a transit vehicle in service and to evaluate their execution of SEPTA's safety rules.

While SEPTA uses metrics, unofficial supervisor observations, wayside checks, and occasional undercover rides, these do not provide comprehensive, recurring individualized assessments of skills to safely operate the vehicle and safety protocol adherence needed to formally coach/develop operators, particularly in their first 3 years. The inability to identify performance gaps regularly at the individual level hinders SEPTA's capacity to prevent incidents through targeted retraining and oversight. Implementing formal evaluation, coaching and development procedures conducted frequently would strengthen SEPTA's safety management.

The lack of formal, regular performance evaluations for SEPTA's bus and trolley operators presents clear risks to safe transit operations. As discussed with SEPTA's bus and trolley leadership teams, conducting formal performance evaluations for bus and trolley operators on an annual basis:

- **Identifies training needs and safety risks** – An annual review provides the opportunity to regularly assess if operators are maintaining safe driving skills and following protocols.

- **Identifies any declining performance or gaps in skills** – Annual observations allow safety risks to be identified and addressed promptly through retraining or coaching before incidents occur.

- **Reinforces good practices** – Evaluations also allow positive feedback on safe driving behaviors and compliance with safety rules to reinforce skills that operators are excelling at, so those behaviors continue.

- **Supports professional development** – Performance discussions drive continuous safety improvement by identifying strengths operators can build upon through advancement opportunities as well as areas for growth.

- **Increases accountability** – An established annual process reminds both supervisors and operators of expectations and responsibilities, holding all parties accountable to meeting safety and service quality standards.

Annual evaluations support safety, development, and accountability - all critical for upholding safety standards across a transit organization amidst changes in staffing, protocols, and technologies over time. Consistent, yearly reviews help sustain a culture of continuous learning and advancement while preempting safety risks.

The lack of regular, individualized oversight and development, especially among less experienced operators, directly impacts SEPTA's ability to preemptively address safety risks. Implementing a formal evaluation program including onboard observations, performance metrics review, safety criteria checklists, coaching and retraining will provide the foundation to continuously improve operator skills, prevent incidents, and uphold rigorous safety standards across the operator workforce. Equipping less seasoned operators with regular feedback and guidance early on will be especially critical to reversing the recent upward collision trends.

Required Action

Finding 3.4	**SEPTA Does Not Conduct Regular Performance Evaluations for Transit Operators**
Required Action 4	Within 120 days of issuance of this report, SEPTA must develop an action plan and implementation schedule to ensure that each bus and trolley operator regularly receives a performance evaluation focused on their ability to safely provide service. SEPTA must submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.

Category 3 Finding 5. SEPTA Does Not Provide Sufficient Support to Help New Operators Manage SEPTA's Operating Environment and Perform Duties Safely

Background

New operators at SEPTA, who lack seniority, often receive assigned shifts for late nights, overnights, and weekends. Review of available data shows that while significantly less service and vehicle revenue miles are provided on late nights and weekends, in calendar year 2023, 22 percent of SEPTA's 2023 major bus collisions occurred during evening and overnight off-peak weekday service, and 24 percent of major bus collisions occurred on weekends. This data also shows that in 2023, 41 percent of SEPTA's major bus collisions occurred during shifts where new bus operators likely were working.

A key finding from FTA's SMI is that new SEPTA operators receive minimal behind-the-wheel skill development for overnight and weekend shifts despite being assigned these shifts upon entering service. While new operator trainees receive 16-23 days of on-road training, depending on the size of the district, all training occurs between noon and 10 p.m. Training

exclusively during this time fails to prepare new operator trainees for overnight and weekend shifts they will be operating.

Unfamiliarity with terrain, decreased visibility, and public transportation use intrinsic to late nights and weekends directly impact safe operating capacity. Without proper experience navigating the distinct challenges across all shifts, new operators struggle to safely traverse their assigned service times.

Training is not offered during the times nor along the routes most new operators likely will be driving. Driving an unfamiliar route in the dark, often where there is insufficient lighting, makes it challenging to distinguish street names and where to turn. Bus Operations and System Safety interviewees stated it is extremely important for the Training Department to schedule more night and weekend training for new-hire bus operator trainees to acclimate individuals to the environments and conditions they will most likely be operating in. As training currently exists, bus operator trainees have little exposure to the shifts they will most likely be assigned as new operators.

Compounding this training gap is an absence of formal mentoring post-instruction to enable the refinement of skills critical for safe operations, ask questions, and uphold safety standards. During FTA's SMI, a common theme emerged across multiple SEPTA locations that new operators feel left to their own devices to navigate their shifts with little additional support from supervisors and/or instructors. Interviewees indicated that SEPTA does not adequately invest in their skill development for safe operations or adherence to safety rules.

Coaching and mentoring programs provide critical guidance and support for developing safe operating skills among new transit operators. At SEPTA, the bus operations training team conveyed that a lack of experienced operator mentors combined with busy instructor schedules has weakened onboard coaching, that is key for reinforcing initial safe operating skills and safety protocols. With limited staff, SEPTA’s existing mentoring program is not functional and cannot facilitate regular contact and performance discussions after trainees enter service, deficiencies in adhering to defensive driving techniques, passenger sensitivity policies or other safe operating practices often go undetected.

Some incoming operators partially offset gaps in Authority-led coaching by seeking assistance from fellow union members or Local Safety Committee members. FTA finds that this type of interaction is particularly important for new bus and trolley operators, who are involved in a significant portion of major collisions.

SEPTA interviewees recommended implementing expanded operating hours for initial on-road skill building as well as assigning new hires mentor operators for at minimum one year to provide vital supplemental guidance. FTA agrees that new operators must receive robust training catered to the routes they will service across all shifts paired with readily available coaching support from seasoned personnel. This coupling addresses inherent safety knowledge gaps that arise with limited exposure during onboarding.

Required Action

Finding 3.5	**SEPTA Does Not Provide Sufficient Support to Help New Operators Manage SEPTA's Operating Environment and Perform Duties Safely**
Required Action 5	Within 90 days of issuance of this report, SEPTA must provide an action plan and implementation schedule to provide training during all three shifts for new bus, trolley, and rail transit operators to work to ensure new workers' familiarity of the unique safety environment present during each of the shifts. This training must provide the opportunity for new operators to drive and be evaluated under nighttime conditions and in locations where they may be operating passenger service during their initial runs and routes. SEPTA must submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.
Required Action 6	Within 120 days of issuance of this report, SEPTA must develop an action plan and implementation schedule for a bus operator new hire safety performance mentoring and coaching program to improve learning for all operators and focus on positive contact with new operators after onboarding. SEPTA must consider the following when developing this plan: 1. Observations from instructors and/or operations leadership and supervision in coordination with SEPTA's peer mentoring program to validate the training the employee has received and to support their comfort in their new role. 2. Expansion of the peer mentoring program to include input from Local 234 regarding the assigned peer mentors, and to provide an opportunity for the operator to meet with the peer mentor bi-weekly to cover a safety scenario or safety method and receive helpful coaching. SEPTA must submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.

Category 3 Finding 6. Lack of Coordination and Prioritization on Intersection and Grade Crossing Safety and Detour Management

Background

Operating in Philadelphia, SEPTA trolleys and buses must navigate routes and roads that often present challenges for vehicles and traffic patterns. FTA's review of SEPTA's accident data, observations of SEPTA's bus and trolley operations, and results of interviews with operators, supervisors, and managers indicate that SEPTA's operating environment contributes significantly to accidents and incidents in service. SEPTA's operating environment includes many poor visibility locations, unprotected pedestrian walkways, tight turn radii, inadequate warnings and traffic control devices at intersections and grade crossings, and narrow, parking-lined streets that allow vehicles to block busways.

To support improvements in road traffic safety for trolley service, SEPTA's 2022 Rail ASP explains that SEPTA "utilizes a programmed approach to implement grade crossing warning device improvements. These improvements are intended to standardize the rail-highway at grade warning systems and bring them into compliance with the Manual of Uniform Traffic Control Devices (MUTCD) and performed jointly between SEPTA and PennDOT."[22] Interviews conducted during the SMI confirm that SEPTA applies a similar approach to managing roadway improvements to support bus service.

The MUTCD*,* issued by the Federal Highway Administration (FHWA) under 23 CFR part 655, Subpart F, establishes "uniform national criteria for the use of traffic control devices that meet the needs and expectancy of road users on all streets, highways, pedestrian and bicycle facilities, and site roadways open to public travel" to promote safety, mobility, and uniformity through traffic control devices. The purpose of the MUTCD is to provide uniformity of these devices, which include signs, signals, and pavement markings, to promote highway safety and efficiency on the Nation's streets and highways.

While issued by the FHWA, the MUTCD is implemented by the individual State and local highway agencies that select, install, operate, and maintain all traffic control devices on all public roadways (including the Interstate and the U.S. numbered systems) nationwide. SEPTA predominantly works with PennDOT District 6 on MUTCD improvements.[23]

There are no Federal requirements mandating collaboration between transit agencies and State or local departments of transportation (DOTs) on MUTCD compliance and road safety improvements. FTA appreciates that SEPTA ultimately has no control over road safety decisions made by PennDOT or the City of Philadelphia. However, many transit agencies nationwide have established formal partnerships or memoranda of understanding with State and local DOTs to

[22] *Public Transportation Agency Safety Plan—Rail Transit* (2022) (current SEPTA rail transit ASP), Chapter 10.5.1, Rail Transit, sub-section 10.5.1.1 Grade Crossings, page 94.

[23] Pennsylvania has adopted the MUTCD as published by the FHWA with Pennsylvania specific modifications through Title 67 PA Code, Chapter 212, Official Traffic Control Devices, issued as Publication 213.

facilitate ongoing collaboration and coordination on these issues. In these relationships, SEPTA's peer transit agencies assume full or partial responsibilities to design, fund, engineer, and construct road and traffic safety improvements critical to their safety performance, in partnership or collaboration with State and local DOTs as part of capital projects or other initiatives.

Through the SMI, FTA finds that many SEPTA rail crossings and intersections have not yet been upgraded to incorporate recommended safety devices per the MUTCD. Field reviews found non-compliance with expected signs, pavement markings, limit lines, treatments, and other warnings to improve safety. FTA finds similar issues on narrow roadways.

Rail

FTA conducted a sample review of rail crossing warning devices for conformance with MUTCD requirements. Most SEPTA rail crossings do not include advance railroad warning devices, W10-1 warning signs, pavement markings, limit lines, LED train approach blank-out signs, or other devices consistent with MUTCD Chapter 8B.

FTA analyzed recent accident investigation reports and conducted independent field reviews of several trolley accident locations. Between January and September 2023, there were 28 reported accidents on the trolley, with these lines also being responsible for six out of SEPTA's 11 total rail derailments. The investigation reports pinpointed the "action of motorist" or "rule violation" as the primary causes of these accidents yet overlooked important factors such as inadequacies in trolley limit lines, issues with poor lighting, obstructed lines of sight, and nonconformance with the MUTCD standards in terms of signage and pavement markings.

For example, FTA visited the 41st Street and Lancaster Avenue crossing and observed that this location was missing MUTCD standard traffic control devices such as:

- Dynamic envelope of the trolley markings,
- Stop bars/ limit line,
- Do Not Stop on Tracks signage,
- Grade crossing warning approach signage, or
- Train approach LED blank out sign for changing traffic patterns.

Similarly, field inspections and interviews with frontline operators identified accidents from specific locations, such as the 69th Street Transportation Center Station crossing and the Garrettford Station crossing, as particularly high-risk areas for accidents due to their unique configurations. Characteristics of these intersections included insufficient rail warning devices, unprotected pedestrian paths, and obstructed visibility due to nearby buildings. FTA noted that MUTCD crossing treatments and LED light upgrades were not uniformly applied at these locations.

Recent accident investigations did not identify these deficiencies as contributing factors. FTA finds that upgrading traffic control devices to meet MUTCD guidelines could reduce future accidents. While SEPTA tracks "hot spots" and works to mitigate risks, progress requires interagency collaboration with PennDOT District 6 and local transportation departments. Competing priorities regarding street configurations, parking, and planning detours hinder resolution. More urgency is needed to upgrade locations to national safety standards.

Bus

During the SMI, observations and interviews noted concern that on-road safety of bus operations is affected by issues with intersections and crossings, narrow streets, detours, and vehicles parked or stopped illegally in dedicated busways and at bus stops. Many SEPTA bus routes operate on narrow streets with on-street parking. Additionally, some bus routes include tight right turns that lead to bus tires rolling over sidewalks. Also, observations of transfer center locations noted the need for bus operators to make reverse movements to complete turns. These conditions and routing concerns create safety risk that could result in unwanted events, including collisions with vehicles and pedestrians.

FTA appreciates that some progress is being made. FTA observed new, red bus-only lanes on Market Street, resulting from a partnership with the City of Philadelphia and PennDOT to install these bus-only lanes on Market Street from 20th to 15th Streets (eastbound) and Juniper to 6th Streets (both directions) in Center City. FTA recognizes that this initiative adds approximately 1.75 miles of red bus lanes to SEPTA's network – nearly tripling its current mileage of red bus lanes.

However, in interviews, tours with SEPTA operators and supervisors, and independent assessments, FTA identified numerous concerns with road design issues affecting SEPTA's bus operations, including: the aforementioned narrow streets with on-street parking, long crossing distances (sides of the street in some locations are spaced over 1,000 feet apart), numerous driveways and access points (these create more conflict points between people driving and walking), complex intersections (high volume lanes coupled with non-perpendicular intersections increase the chances of collisions), and sidewalk gaps. Pedestrian safety issues, leading to potential strikes with SEPTA buses, were also identified, including crumbling sidewalks, narrow medians, and lack of signage and crossing protections.

Reviews of safety data, investigation reports and the results of interviews draw clear connections between unsafe road conditions and SEPTA's safety performance.

SEPTA has several efforts in place to reduce risk presented at intersections, crossings, transportation centers, and along bus routes and stops. SEPTA trolley and bus operators can and do report concerns with intersections and detours through their Location Safety Committees, and these reports are reviewed through the safety committee process. SEPTA bus operations leadership interviews revealed that SEPTA is looking at various collision and pedestrian avoidance technologies for vehicles and is planning to test after-market technology with the potential to reduce safety risk.

SEPTA maintains a list of SEPTA accident "hot spot" locations and has coordinated with PennDOT District 6 and the City or County on traffic improvements for the 22nd and Walnut intersection, 63rd and Malvern intersection, and bus depot entrances and exits. The City of Philadelphia's Department of City Streets has a Transit Operations Committee to support safety initiatives such as Complete Streets and Vision Zero as well as discuss intersection design and safety and manage bus detours. Finally, SEPTA is also working with the Philadelphia Parking Authority to minimize issues with vehicles blocking dedicated busways.

However, there is much more to be done. None of these measures focus attention on this critical safety issue or keep pressure on Commonwealth and regional partners to support road safety improvements and traffic enhancements designed specifically to support improvements in SEPTA's safety performance.

Interviews and review of incidents and reports also demonstrate that SEPTA's bus system also faces several key challenges in providing safe and reliable service when the State, Philadelphia, and regional partners plan detours and construction projects without proper coordination:

- **Insufficient notice** – SEPTA does not always receive advance warning about road and lane closures from cities, forcing last-minute rerouting. This leaves minimal time to safely plan detours, train operators, inform riders effectively.

- **Infeasible routes** – Proposed detour routes may be challenging for buses to navigate safely (e.g.,.: too narrow, tight turns, low overpasses, inadequate surfaces, etc.). Regional partners can overlook operational constraints without SEPTA's input.

- **Operator confusion** – Drivers unfamiliar with hastily rerouted lines may get lost trying to follow improvised directions, causing delays and heightening accident risks.

- **Rider uncertainty** – Stop closures and unpredictable temporary pickup locations create confusion that can lead stranded customers, unsafe boarding attempts between stops, or pedestrian accidents.

- **Limited accessibility** – Detours may inadvertently bypass sections of the route designed to accommodate disabled passengers, temporarily reducing critical access or placing passengers with disabilities in unfamiliar and dangerous locations.

Uncoordinated projects that route transit service without proper coordination led to haphazard changes that degrade reliability, rider access, public safety, and operator working conditions. SEPTA must work to ensure its Commonwealth and regional partners improve coordination on infrastructure and transportation planning processes.

Required Action

Finding 3.6	**Lack of Coordination and Prioritization on Intersection and Grade Crossing Safety and Detour Management**
Required Action 7	Within 45 days of issuance of this report, SEPTA must submit to FTA for review and approval a list of bus intersections and rail crossings that have had multiple accidents or incidents during the period 2018 through 2023 or have been determined to be at high risk for accidents. This list must include photographs and a summary of accident history for each location.
Required Action 8	Within 90 days of approval of the list developed in response to Finding 6, Required Action 7 (Required Action FTA-24-3-006-1 of Special Directive 24-3), SEPTA must develop an action plan and schedule to review the list of identified bus intersections and rail crossings for potential traffic safety improvements to be coordinated with PennDOT and local jurisdictions. To the extent feasible, these reviews should take place in coordination with the appropriate PennDOT district office and the local jurisdictions. SEPTA must submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.
Required Action 9	Within 150 days after issuance of this report, SEPTA must prepare an action plan and schedule to conduct an analysis of how current service design puts operators in difficult or unsafe situations (e.g., narrow roads with on-street parking, tight turns that cause the bus to roll over curb frequently, transfer center that requires the operator to put the bus in reverse without a spotter, lack of appropriate facilities or adequate lighting at end-of-line points). The analysis must identify potential improvements in service design to be implemented directly by SEPTA or coordinated with PennDOT and local jurisdictions as appropriate. SEPTA must submit the action plan and schedule to FTA for review and approval. SEPTA must submit the analysis for FTA review and acceptance. FTA will monitor implementation of the action plan and schedule, and subsequent analysis and improvements.
Required Action 10	Within 75 days after issuance of this report, SEPTA must develop an action plan and schedule to coordinate with city officials to develop a city construction detours management plan to reduce the impacts of construction detours on transit service. SEPTA must submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.

Category 3 Finding 7. SEPTA Does Not Address Safety Impacts of Multimodal Certifications

Background

SEPTA new-hire bus operators are assigned to a district[24] before they complete training. Unlike any other SEPTA district, Victory District provides both bus and trolley service. Existing operating agreements require new hires to receive training to operate buses and trolleys in this district. Bus driver applicants at Victory must acquire a CDL bus driver's license and must obtain rail certification on the Media Sharon Hill trolley and NHSL within the first year of employment. Rail certification must be maintained through an annual recertification class.

This situation requires SEPTA to invest a significant amount of time in training and recertifying operators who predominantly operate buses on trolley service. Interviews noted that approximately 80 percent of the operators in the Victory District are assigned to operate only buses but must attend annual rail trolley recertification training. Many of these operators may only operate a trolley vehicle during initial and refresher training and, according to interviews, do not feel comfortable safely operating a trolley in revenue service with passengers, because they operate them infrequently.

While this dual training and certification arrangement provides some operational flexibility for the Victory district, this requirement diverts operator and training resources away from where they could be more productively used to support safety training for dedicated bus or trolley operators. As a result of this requirement, SEPTA spends its limited time and resources training transit workers to operate trolleys who will only ever operate buses or who, if drafted to operate trolley service, are uncomfortable doing so.

As of December 2023, SEPTA's Victory facility had a shortfall of over 40 operators in a division that requires about 360 operators. The requirement for dual certifications places additional strain on resources at Victory District, requiring bus operators to take time to recertify for trolley operation, and has resulted in rail operators reaching their hours-of-service limits when operating bus routes and/or needing extra training and recertification in bus operations.

During SMI interviews, SEPTA workers also expressed that Victory District operators face other operational challenges, such as minimal scheduled breaks, make-up time at the end-of-lines, issues with maintaining radio connections in service; and safety concerns at high-risk intersections and areas—notably the 69th Street intersection and the Garrettford area for trolley and auto incidents.

[24] SEPTA's City Transit Division is broken down into seven districts (Allegheny, Callowhill, Comly, Elmwood, Frankford, Midvale, and Southern) and Contract Operations. SEPTA's Suburban Transit Division contains two additional districts (Frontier and Victory) and Contract Operations.

Required Action

Finding 3.7	**SEPTA Does Not Address Safety Impacts of Multimodal Certifications**
Required Action 11	Within 150 days of issuance of this report, SEPTA must conduct an analysis of the bus and rail operator resources at the Victory District and determine impacts of multimodal certification for training, resources (vacancies), hours of service, safety incidents, and worker confidence in their ability to perform their job safely. SEPTA must submit the analysis to FTA for review and approval. Within 30 days of FTA approval of the analysis, SEPTA must develop an action plan to address the results of the analysis and submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.

Category 3 Finding 8. SEPTA Has Not Formalized Policies for the Safe Movement and Securement of Transit Vehicles in Rail Transit Maintenance Facilities

Background

Each SEPTA maintenance facility has distinct vehicle securement and movement practices displayed on facility bulletin boards, written to address the unique vehicles, infrastructure, and movement circumstance at each location.

SEPTA's *Rail Operations Division Rules Manual* requires workers to secure vehicles per Rail Division Rule 35 (RDR-35). The rule states, "When leaving the control stand or operating cab, storing or otherwise leaving a train, vehicle or equipment unattended, the equipment must be adequately secured in accordance with the applicable procedures to ensure against undesired movement." The rule does not define "adequately secured" nor does it provide "applicable procedures." In addition, while the rulebook states on the cover that it applies to maintenance personnel, its focus is on operators. Likewise, the information available in SEPTA's *Safety Awareness Manual for Yards and Shops* is noted as modified for training purposes; and is only for the purpose of simplifying difficult rules and procedures. This manual is not provided as a rulebook.

Over the past three years, SEPTA has experienced six runaway events, including an incident on July 27, 2023, which is under investigation by the NTSB, where a SEPTA trolley derailed at the intersection of Island Avenue and Woodland Avenue in Philadelphia, Pennsylvania, and struck a sport utility vehicle and the Blue Bell Inn. Through the SMI, FTA reviewed the NTSB's initial published findings from the investigation into this incident and SEPTA mitigations put in place to prevent recurrence.

On the day of the accident, the trolley involved in the accident was undergoing an air compressor replacement at SEPTA's Elmwood maintenance facility. The replacement process spanned multiple shifts throughout the day and involved multiple maintenance personnel. As part of this process, maintenance personnel rendered the trolley's air brakes inoperable to allow for the manual repositioning of the trolley within the facility. Shortly before the accident, a shift foreman instructed a maintenance technician to reposition the trolley for temporary storage. However, apparently, there was no indication (such as a tag or note) that the trolley's air brakes had been rendered inoperable. The maintenance technician operated the trolley under its own power toward Island Avenue, but when he attempted to apply the air brakes, the trolley failed to stop. The trolley continued the downhill grade along Island Avenue until it derailed at the intersection of Island Avenue and Woodland Avenue about 20 mph.

SEPTA's Rail Equipment Engineering & Maintenance Department (REE&M) took several actions following this recent event, including developing the *Rail Equipment Maintenance Standard Operating Procedure Movement of Light Rail Vehicles by Maintenance Personnel* (August 9, 2023), which "establishes a standard for rail equipment maintenance [transit workers] while moving vehicles into and out of maintenance shops for service." The procedure covers instructions for:

- movement from yard into car house or shop,
- movement from car house or shop into the yard,
- movement of disabled vehicles, and
- rear movement of vehicle.

In interviews, SEPTA indicated that a procedure for the safe movement of heavy rail vehicles in rail transit maintenance facilities still needs to be developed.

Document reviews and interviews identified the absence of formalized procedures for several other practices with safety implications: yard and shop movements; vehicle cannibalization; and blue flag/signal/cone.

Required Action

Finding 3.8	**SEPTA Has Not Formalized Policies for the Safe Movement and Securement of Transit Vehicles in Rail Transit Maintenance Facilities**
Required Action 12	Within 120 days of issuance of this report, SEPTA must complete development of the Rail Equipment Engineering and Maintenance Department's Standard Operating Procedures (SOP)/procedures for heavy rail and trolley vehicle securement and movement within and around rail transit maintenance facilities and ensure all transit workers responsible for such vehicle movement are trained on and issued the appropriate SOPs/procedures. SEPTA must submit the revised procedure(s), training documentation, and evidence of training completion and SOP/procedure issuance to FTA for review, approval, and implementation monitoring.

Category 3 Finding 9. Quality of SEPTA's Pre-trip Inspection Process Is Inconsistently Monitored

Background

Pre-trip inspections involve operators inspecting their assigned vehicles before operation to verify all equipment is in good working order. The *Commonwealth of Pennsylvania Commercial Driver's Manual* Section 11.5 lists transit bus vehicle inspection requirements including: passenger entry/lift; emergency exits; passenger seating; door/mirrors; level/air leaks; fuel tanks; baggage compartments; battery/box; steering; brakes; suspension; wheels; side and rear of vehicle.

SEPTA bus operators must perform pre-trip inspections of vehicles before beginning revenue service and during shift changes on route (Rule BDR-150), while pre-trip inspections for MFL/BSL are conducted in the yard-by-yard operations personnel who bring trains to platforms to be picked up by operators. The following SEPTA documents designate pre-trip inspections as the responsibility of rail and bus operators.

- RDR-921 General Responsibility of Rail Vehicle Operators, requires of rail operators that they perform "a vehicle inspection in accordance with the current procedure prescribed for that specific vehicle before departing any yard or when making relief."[25]

- *Operations – Vehicle Maintenance Fleet Management Plan Bus Fleet, Fiscal Years 2015 – 2023* (June 2020), states, "Daily vehicle CDL pre-trip inspection are performed with strong customer focus to ensure that no vehicle enters revenue service with a known or

[25] RDR-921, General Responsibility of Rail Vehicle Operators section.

customer-perceived safety defect, in order to provide safe, mechanically reliable, clean and comfortable vehicles to the customer."[26]

- *SEPTA Public Transportation Agency Safety Plan—Bus Transit* (2020) (Bus ASP) explains that Transportation Managers conduct CDL Pre-trip inspection paperwork reviews.[27]

Interviews at numerous locations revealed inconsistencies and a lack of clarity surrounding pre-trip inspection protocols, including the allotted time and required procedures for conducting them. In field observations, FTA's SMI team noted variability in how operators perform and time their pre-trip inspections across locations and vehicle types.

SEPTA bus operators must perform pre-trip inspections of vehicles before beginning revenue service and during shift changes on route (Rule BDR-150). However, during interviews, SEPTA's bus operations leadership and district management confirmed that while supervisors sometimes oversee pre-trip inspections in the yard, they do not have a formalized or scheduled compliance inspection program. Compliance is primarily monitored by ensuring each operator fills out and submits a paper pre-trip inspection form. However, the quality or thoroughness of the inspection is not reviewed.

For example, SEPTA bus pre-trip inspections do not include the use of tools, markers, or tape in the bus yard to support proper mirror alignment/adjustment. However, SEPTA investigators do check mirror and placement as part of accident investigations, and instructors also review these items as part of ride-alongs and re-certification. SEPTA operators indicated in interviews that improper mirror alignment is a major contributor to incidents and accidents and clarified that they face challenges in ensuring proper adjustment as part of the pre-trip inspection.

Prior discussions with executive leadership suggested that while SEPTA does conduct occasional pre-trip inspection evaluations, there are no established processes for assessing effectiveness and efficiency and no efficiency testing to ensure that operators perform quality pre-trip inspections. At present, the approach focuses on correcting operators' mistakes as identified through random observations rather than allowing transit workers to demonstrate proficiency gained via training. To confirm proper application of training, SEPTA should evaluate pre-trip inspections on clearly defined metrics, documenting areas needing improvement and those indicating success. This would further hold workers accountable to carrying out thorough, efficient pre-trip inspections.

The lack of compliance monitoring for pre-trip inspections increases the likelihood of buses entering or continuing revenue service with defects that could result in a safety event. SEPTA must clarify pre-trip inspection standards for bus, trolley, and rail equipment. Formalizing a universal pre-trip inspection routine with standardized methods and durations and formal

[26] *Operations – Vehicle Maintenance Fleet Management Plan Bus Fleet, Fiscal Years 2015 – 2023* (June 2020), Scheduled Maintenance section, page 12

[27] *SEPTA Public Transportation Agency Safety Plan—Bus Transit* (2020), Section 10.2.3, page 79.

efficiency testing would promote consistency and quality in the performance of these critical inspections.

Required Action

Finding 3.9	**Quality of SEPTA's Pre-trip Inspection Process Is Inconsistently Monitored**
Required Action 13	Within 90 days of issuance of this report, SEPTA must develop an action plan and schedule to enhance training and supervision regarding the conduct of pre-trip inspections, including a validation tool to measure pre-trip efficiency with employees. SEPTA must submit the action plan and implementation schedule for FTA review, approval, and implementation monitoring, and the validation tool for FTA review, acceptance, and implementation monitoring.

Category 3 Finding 10. SEPTA Faces Numerous Challenges with the Performance of Its Radio System

Background

A functioning radio system is critical to the safety of SEPTA's transit operations for several key reasons:

- **Emergency response** – Radios allow operators to immediately report incidents, accidents, or unsafe conditions and to receive urgent assistance to mitigate and address safety concerns in service. Breakdowns in communication capabilities delay response.

- **Supervisory coordination** – Supervisors monitor radio communications to provide guidance, information, and direct support across the transit system. Radio dysfunction impairs oversight and resource deployment for safe operations.

- **Dynamic routing** – Controllers disseminate detour instructions, service advisories, and relevant updates via radio to help drivers navigate changes safely and efficiently. Communication failures heighten risk exposure from route changes.

- **Background awareness enhancement** – Radioed information on traffic conditions, problematic vehicles/passengers and infrastructure, emergencies, or challenges prompt operator awareness and readiness to respond to changes or alerts.

Deficient radio systems weaken these safety-critical capabilities proportionally to the magnitude and duration of outages.

FTA reviewed dozens of safety event investigation reports and identified several events where poor radio quality was identified as a contributing factor in the event. Interviews with frontline

operations, maintenance, and OCC personnel highlighted challenges with radio communication that affect the safety of SEPTA's operations and ability to respond to emergency conditions.

Interviews with SEPTA's Bus OCC leadership revealed inconsistent radio coverage across SEPTA's bus service operating area. Bus OCC leadership confirmed the presence of radio dead spots, particularly in the more remote suburban service areas.

Bus Operators in these radio dead spots cannot communicate with the OCC via radio. Additionally, SEPTA's current policies do not permit Bus Operators to use their personal cell phones while on duty. The lack of a Bus Operator's ability to communicate with the OCC in an emergency is concerning because the OCC cannot guide Bus Operators in responding to an emergency. Also, since the OCC cannot be informed of an emergency, an overall operational response will not be triggered promptly.

Bus OCC leadership confirmed they report these dead spots to radio maintenance; however, radio dead spots persist in the system. SEPTA also confirmed they are evaluating their current personal cell phone use policy. Cell phones could potentially be a source of backup radio communication between an Operator and the OCC.

SEPTA's analog closed trunk system has designated channels for each rail transit line with bus broadcast transmitted through different towers throughout the region. Interviews with SEPTA workers and leadership identified widespread radio issues:

- Bus operators reported and demonstrated problems with transmissions and "dead spots" in radio coverage, including multiple known locations from which they could not transmit to OCC.

- Trolley operators reported challenges in maintaining stable radio communications on their routes without interruptions or interference.

- Bus Operations Control Center leadership revealed inconsistent radio coverage across SEPTA's bus service operating area and confirmed dead spots, particularly in the more remote suburban service areas.

- Control Center managers explained that radio communications can be blocked when multiple people attempt to use the network at the same time.

Radio system challenges are most cri cal during emergency situa ons necessita ng mely informa on, response, guidance, and ongoing updates. Currently, SEPTA policies do not permit operators to use their personal cell phones while on duty. As such, SEPTA is evalua ng the personal cell phone use policy as personal cell phones could be a source of backup communica on between an operator and the Control Center. Further, SEPTA is examining the current "Stop and Proceed" prac ce for rail opera ons, which requires addi onal communica on between the operator and OCC to proceed through specific loca ons and may be causing more radio traffic than necessary.

SEPTA representatives indicated that a capital program is underway to upgrade the radio system, however, SEPTA did not provide FTA with details regarding the dedicated funding or scope and timeframe of this project. Numerous safety-critical functions, from workers calling onto the right-of-way, to safe management of detours and events in service, to safe communication during emergencies, depend on a functioning radio system.

Required Action

Finding 3.10	**SEPTA Faces Numerous Challenges with the Performance of Its Radio System**
Required Action 14	Within 120 days of issuance of this report, SEPTA must develop an action plan and schedule for radio enhancements to improve and monitor radio performance. This plan must include all intended capital projects to replace, repair, or upgrade radio system components. SEPTA must submit this plan and implementation schedule to FTA for review, approval, and implementation monitoring.

Category 4 – PennDOT SSO Program Resources

FTA's SMI team reviewed PennDOT's *State Safety Oversight Agency Program Standard* (2023) (Program Standard), workload staffing assessment, and other documentation of its work to oversee safety at SEPTA's rail transit system.[28]

Category 4 Finding 1. PennDOT's SSO Program Must Be Strengthened to Address the Size and Complexity of the SEPTA System

Background

PennDOT is the SSOA designated by the Commonwealth of Pennsylvania as responsible for overseeing rail transit safety in Pennsylvania. FTA certified PennDOT's SSOA program in April 2018 in accordance with the requirements of Federal transportation law (49 U.S.C. § 5329(e)) and FTA's SSO regulation (49 CFR Part 674) (Part 674). FTA issued its most recent triennial SSO audit report to PennDOT on January 26, 2022, which included four findings for PennDOT's program, the last of which was closed on January 6, 2023.

[28] While PennDOT's SSO program oversees three RTAs, the findings and required actions from this SMI focus only on PennDOT's oversight of SEPTA's rail transit system.

PennDOT Role and Authority

PennDOT's SSO program establishes minimum safety standards for the three covered RTAs in the Commonwealth.[29] PennDOT's primary oversight activities include independent RTA safety audits, CAP oversight, engagement in RTA safety programs; review and approval, oversight, and enforcement of each RTA's Rail ASP, and ensuring the sufficiency and thoroughness of safety event investigations. Federal requirements for the SSO program do not include bus modes.

Per Pennsylvania State Law, Title 74 Part II (Public Transportation),[30] PennDOT's SSO program has the authority to act in response to allegations of non-compliance with the Rail ASP, violations of SSOA requirements, and Special Directive(s) from the FTA. PennDOT's authority determines the appropriate actions to be taken based on the severity of a violation, deficiency, safety issue, and/or emergency. PennDOT also has the authority to collect and analyze data and conduct risk-based inspections of the three RTAs in its jurisdiction, including SEPTA.

This authority includes the ability to impose an emergency suspension of service when an RTA does not take appropriate action in response to an unacceptable hazard. PennDOT also may suspend or redirect SEPTA's grant funding from the Commonwealth of Pennsylvania. If PennDOT is not satisfied with the quantity or quality of information or timeliness of response from the RTA, PennDOT has established an escalation protocol for engaging the RTA's Chief Safety Officer, Accountable Executive, Board of Directors, and the PennDOT Secretary.

PennDOT SSO Program Staffing and Technical Capacity to Manage SEPTA Safety Concerns

Per § 674.5(a), each State with an RTA under its jurisdiction must ensure that the designated SSOA has the authority, resources, and qualified personnel sufficient to oversee the number, size, and complexity of the RTAs that operate within the State.

During the SMI, FTA confirmed that PennDOT engages in substantial oversight activity at SEPTA, including:

- participation in or observation of SEPTA inspections and internal audits and executing its own triennial audit program,
- monitoring CAPs and the safety condition of and mitigations in place for track and related facilities,
- attendance of SEPTA safety meetings to monitor SRM and SMS implementation,
- conducting maintenance documentation spot checks, and

[29] See Appendix C: PennDOT Overview for more information about PennDOT's SSO program and responsibilities.
[30] See 74 Pa.C.S.A. § 1510(b).

- conducting biweekly and monthly inspections of critical SEPTA locations and procedures.

PennDOT has taken action to increase its staffing devoted to the SSO program since April 2018, when the SSO program received FTA certification. In its 2023 SSOA workload assessment, PennDOT identified the need for at least 11 full-time equivalent staff (FTE) to execute its full SSO program. In 2023, PennDOT supplied an average of 9.3 FTEs, with 6.4 FTEs focused specifically on SEPTA. In May 2023, PennDOT hired two staff program managers, which brought the agency to 11.3 FTEs.

FTA finds that its current staffing level, although exceeding its 2023 workload assessment, is not commensurate with the size and complexity of the SEPTA rail transit system at its current level of safety performance. Beyond safety performance, PennDOT identified substantial deficiencies in SEPTA's work to implement SMS as required in Part 673 and the PennDOT Program Standard and as described in SEPTA's *Public Transportation Agency Safety Plan—Rail Transit* (2022) (Rail ASP).[31] The work necessary to implement this Federal requirement will require additional SSO oversight exceeding the level made possible with its current FTEs. Additionally, the substantial challenges relating to SEPTA training, supervision, and safety rules compliance described earlier in this report demand significant PennDOT oversight and attention. The remaining findings issued to PennDOT through this SMI further demonstrate the need for additional resources to provide effective oversight.

FTA finds that PennDOT's SSO program requires more resources to:

- address deficiencies in SEPTA's SRM and Safety Assurance practices and ensure SMS implementation;
- address deficiencies in SEPTA's safety training, operations and maintenance supervision, and compliance with safety rules;
- ensure SEPTA safety concerns are identified, assessed, mitigated, and monitored;
- support SEPTA internal safety review improvement and thoroughness;
- improve SEPTA CAPs and safety event investigation management;
- enforce requirements included in SEPTA CAPs; and
- drive SEPTA to action and ensure timely resolution of identified safety issues.

Available Federal Funding

PennDOT has access to a significant reserve of Federal funding to support its SSO program. For Federal Fiscal Year 2024 alone, FTA apportioned $2.84 million in Section 5329 SSO program

[31] References to the Rail ASP in this report are, unless otherwise stated, to the 2022 version of the Rail ASP.

funding to the Commonwealth of Pennsylvania's SSO program. With the required Commonwealth matching funds, Pennsylvania's SSO program has access to over $3.4 million for Federal Fiscal Year 2024. Between Federal Fiscal Years 2013 and 2023, PennDOT accessed over $12.5 million and has another $8.3 million available for over $10 million remaining in available funds to support their program.

Required Action

Finding 4.1	**PennDOT's SSO Program Must Be Strengthened to Address the Size and Complexity of the SEPTA System**
Required Action 1	Within 45 days of issuance of this Special Directive, PennDOT must conduct a workload assessment for its SSO program devoted to SEPTA oversight, which must include additional available and accountable personnel resources. Specifically, the workload assessment must include activities and associated personnel to expedite oversight action regarding closure of SEPTA's open corrective action plans, improve both the timeliness and quality of SEPTA's safety event investigation reports adopted by PennDOT and ensure their sufficiency and thoroughness, work with SEPTA to oversee SMS implementation and effectiveness, and be prepared to respond to new and emerging safety concerns. The workload assessment must be submitted to FTA for review, approval, and implementation monitoring.

Category 4 Finding 2. **PennDOT is Tracking Many Open SEPTA CAPs from SSO Audits, Accidents/Incidents, Hazards, SEPTA Internal Audits, and Other Sources with Extended Timelines Past Initial Due Dates**

Background

Per § 674.37(a), the SSOA must review and approve an RTA's CAP before the RTA carries out the plan.[32] A CAP must describe the actions the RTA will take to minimize, control, correct, or eliminate the safety concern(s) identified by the CAP, the timeline for taking those actions, and the individuals responsible for taking those actions. The RTA must periodically report to the SSOA on its progress in carrying out the CAP. The SSOA may monitor the RTA's progress in carrying out the CAP through unannounced, on-site inspections or any other means the SSOA deems necessary or appropriate.

PennDOT's Program Standard requires SEPTA to develop CAPs in response to findings from its internal safety reviews and SSOA audits, safety event investigations, hazards, NTSB

[32] An exception may be made for immediate or emergency corrective actions that must be taken to ensure immediate safety, provided that the SSOA has been given timely notification, and the SSOA provides subsequent review and approval.

investigations, safety data trends and analysis, and FTA recommendations and guidance provided through Special Directives, among other sources. The Program Standard states that PennDOT must approve all submitted CAPs within 15 calendar days of receipt and that tracking and monthly reporting occurs via PennDOT's identified platform.

As of December 2023, PennDOT was tracking 104 open CAPs at SEPTA, 73 of which were open and 31 of which were open pending PennDOT verification. Of the 104 open CAPs, one dates to calendar year 1999. Excluding this CAP, the remaining 103 open CAPs, dating from 2013 to present, have been open for an average of 327 days. SEPTA frequently requests CAP timeline extensions and that CAPs are not consistently closed within the original timeline.

The length of time CAPs remain open and the numerous extensions required for SEPTA to complete the actions necessary to address the safety concern the CAP is designed to address means that known safety issues remain unresolved. Extended CAP timelines may also mean that the actions identified in the CAP are not as effective as they could be or may no longer be relevant at all. It also indicates a need for greater PennDOT involvement in SEPTA's CAP implementation process.

After previous unsuccessful engagement on improvements related to the CAP program, on October 20, 2023, during the SMI, PennDOT issued an Immediate Action Letter to SEPTA's Chief Executive Officer and General Manager (Accountable Executive) notifying her regarding SEPTA's non-compliance with CAP program requirements. In the letter, PennDOT noted challenges in working with SEPTA on the CAP program including the timeliness and quality of SEPTA's CAP status updates as entered into PennDOT's SMS tracking system, the lack of collaboration in CAP development using a systemwide approach at SEPTA, inability to meet 24-hour reporting requirement for emergency CAPs and to provide PennDOT with third-party audit reports with findings and associated CAPs as requested, as well as challenges in creating CAPs for FTA advisories/bulletins within 30 days and proactively identifying events and hazards needing CAPs and submitting these CAPs to PennDOT. PennDOT also noted progress to date, including SEPTA's commitment to weekly status meetings.

PennDOT clarified that while SEPTA had provided either extension requests, with justifications and milestones, or closure requests for all CAPs with target dates that have passed since previous communications from PennDOT, SEPTA's requests do not constitute approval; PennDOT must assess and respond to each request individually and may require additional information or verification prior to approving any extension or closure request.

PennDOT also clarified that if they reject a proposed CAP, SEPTA will have 15 calendar days to address noted deficiencies in the plan and submit a revised CAP. PennDOT will review the CAP's completeness and will conduct a final verification of documentation, records, or process implementation as appropriate to the particular CAP.

PennDOT concluded its letter by "asking that [SEPTA] consider the development of a CAP approval process that includes approval and review" by the Accountable Executive and the executive leadership team for certain high-risk CAPs and any CAP extension request. In

addition, PennDOT noted that this requested CAP process should clearly articulate how SEPTA will continue to monitor the impacts of closed CAPs through its Safety Assurance process.

Given the extent of both the number of open CAPs and the challenges that SEPTA is experiencing in managing its CAP process, FTA finds that PennDOT must take additional action to ensure the timely resolution of open safety issues and concerns. While FTA appreciates PennDOT's effort to raise awareness regarding non-compliance with CAPs with SEPTA's Accountable Executive, at this stage of escalation, FTA expects PennDOT, at a minimum, to require action from SEPTA and its Accountable Executive to develop and adequately resource a prioritized action plan to close open CAPs. PennDOT must do more to ensure that known safety risks are effectively mitigated and not left unaddressed for extended periods of time.

Required Action

Finding 4.2	**PennDOT is Tracking Many Open SEPTA CAPs from SSO Audits, Accidents/Incidents, Hazards, SEPTA Internal Audits, and Other Sources with Extended Timelines Past Initial Due Dates**
Required Action 2	Within 60 days of issuance of this Special Directive, PennDOT must submit a prioritized CAP list and action plan for overseeing SEPTA actions to expedite the closing of open CAPs. At a minimum, the CAP action plan must include an updated CAP matrix with schedules and responsible parties and detailed explanations for any CAPs that will not be addressed within 12 months of the original due date. This prioritized CAP list and action plan must be submitted to FTA for review, approval, and implementation monitoring.

Category 4 Finding 3. **PennDOT Has Many Open SEPTA Accident and Incident Investigation Reports Not Approved or Adopted Past Initial Due Date**

Background

Per § 674.35(a), an SSOA must investigate or require an investigation of any accident and is ultimately responsible for the sufficiency and thoroughness of all investigations, whether conducted by the SSOA or RTA. If an SSOA requires an RTA to investigate an accident, the SSOA must conduct an independent review of the RTA's findings of causation.

Per § 674.35(b), within a reasonable time, an SSOA must issue a written report on its investigation of an accident or review of an RTA's accident investigation in accordance with the reporting requirements established by the SSOA. The report must describe the investigation activities, identify the factors that caused or contributed to the accident, and set forth a CAP, as necessary or appropriate. The SSOA must formally adopt the report of an accident and transmit that report to the RTA for review and concurrence. If the RTA does not concur with an SSOA's

report, the SSOA may allow the RTA to submit a written dissent from the report, which may be included in the report, at the discretion of the SSOA.

As permitted under Part 674, PennDOT's Program Standard specifies that SEPTA must conduct its own accident investigation and produce its own accident investigation reports that PennDOT reviews and adopts instead of PennDOT's SSO division conducting its own accident investigation process.

FTA reviewed PennDOT's November 2022-January 2023 accident investigation process audit conducted of SEPTA as required under Part 674. The audit found that:

- SEPTA's submitted investigation reports do not contain consistent levels of information.
- SEPTA does not develop CAPs following accident/incident investigations as PennDOT requires.
- SEPTA does not consistently meet the deadline for resubmitting CAPs within the 15-day required timeframe.
- SEPTA's investigation reports do not consistently include sufficient descriptions of post-event testing and research. Recommendations in the report are limited.
- SEPTA does not currently provide PennDOT with a regular progress report on open investigations.

During SMI interviews, PennDOT communicated to FTA that SEPTA accident investigation reports require significant review and revision for PennDOT to accept and adopt them and proceed with CAP development and implementation. PennDOT estimated that it requires resubmission for at least 50 percent of all submitted reports. PennDOT reports that SEPTA's ability to determine causal factors is adequate, but the Authority struggles to document them. PennDOT stated they are actively working with SEPTA to generate more consistency in final reports on root causes.

As approximately 60 percent of accidents that SEPTA must report to PennDOT per SSO requirements occur on streetcar lines, FTA conducted an independent assessment of SEPTA's investigation and report process and of PennDOT's oversight.

In general, SEPTA streetcar investigation reports identified "action of motorist" or "rule violation" as root causes. However, FTA's independent investigation report review and field assessments of identified accident locations found contributory factors beyond those identified in SEPTA investigation reports, such as the implementation of cleaning and maintenance processes, debris and other track contamination, presence or state of signs, painted lines, or other markers, and lighting, line-of-sight issues, or other visibility issues.

Although PennDOT is aware of SEPTA's accident investigation deficiencies and working with SEPTA to remedy these concerns, as of December 2023, PennDOT was tracking over 50 open

accident investigation reports. More emphasis and attention are required to improve SEPTA accident investigation reports and PennDOT needs to guarantee the development of thorough and comprehensive investigation reports, with CAPs to prevent recurrence, that can be adopted by PennDOT in a timely manner.

Required Action

Finding 4.3	**PennDOT Has Many Open SEPTA Accident and Incident Investigation Reports Not Approved or Adopted Past Initial Due Date**
Required Action 3	Within 90 days of issuance of this Special Directive, PennDOT must develop a prioritized action plan and schedule to complete open accident investigation reports for FTA- and PennDOT-reportable events and improve the quality of these reports, including definition of causal factors. PennDOT must submit this action plan and schedule to FTA for review, approval, and implementation monitoring.

Category 5 – PennDOT Safety Oversight of SEPTA's Rail Transit System

FTA determined that PennDOT has sufficient oversight authority and established programs to support more active safety oversight of SEPTA's rail transit system. FTA expects that, when strengthened by the additional resources required in Category 4, PennDOT's SSO program will be able to address a growing number of rail transit safety issues more expediently at SEPTA per their obligations as the SSOA for the Commonwealth of Pennsylvania.

FTA's SMI report issues 11 findings and 14 required actions in this category.

Category 5 Finding 1. **PennDOT Has Not Ensured SEPTA's Compliance with Public Transportation Safety Certification Training Program Requirements**

Background

Per FTA's Public Transportation Safety Certification Training Program (PTSCTP) regulation at 49 CFR § 672.13(a), SEPTA must designate its personnel and contractors who are directly responsible for safety oversight and ensure their compliance with the training requirements set forth in the regulation. The PTSCTP regulation defines *directly responsible for safety oversight* as "public transportation agency personnel whose primary job function includes the development, implementation, and review of the agency's safety plan, and/or the [SSOA] requirements for the rail fixed guideway public transportation system pursuant to [49 CFR Part] 674."

Also, per § 672.21(a), "Each recipient shall ensure that its designated personnel are enrolled in the PTSCTP. Each recipient shall ensure that designated personnel update their individual training record as he or she completes the applicable training requirements of this part."

SEPTA's Rail ASP states that the Authority meets or exceeds PTSCTP requirements.[33] However, FTA identified at least one SEPTA System Safety Division representative directly responsible for safety oversight at SEPTA who has been designated but has not met the PTSCTP criteria. It is important that all designated personnel have or are working towards completion of the PTSCTP training curriculum as outlined in the regulation. The omission of a key SEPTA individual creates concern that other SEPTA safety individuals may also not be registered in the PTSCTP as necessary.

Per its obligations under Part 674 to ensure SEPTA rail transit implements a program in compliance with FTA safety regulations, PennDOT must ensure SEPTA meets the requirements of the PTSCTP regulation.

Required Action

Finding 5.1	**PennDOT Has Not Ensured SEPTA's Compliance with Public Transportation Safety Certification Training Program Requirements**
Required Action 1	Within 30 days of issuance of this report, PennDOT must provide FTA with the list of SEPTA's designated personnel enrolled in the PTSCTP (49 CFR § 672.21(a)). Thereafter, PennDOT must provide quarterly updates documenting that designated SEPTA personnel are completing the applicable training requirements within three years of their designation and, thereafter, complete refresher training every two years (49 CFR § 672.13(c)).

Category 5 Finding 2. **PennDOT Must Expand Activities to Address SEPTA's Lagging SMS Implementation**

Background

FTA's safety regulations mandate that SEPTA must develop and implement an ASP in accordance with Part 673 and annually certify its compliance with Part 673 requirements. SEPTA has two ASPs: one for its rail transit system, the Rail ASP, and one for its non-rail transit, the Bus ASP.

Per § 674.25(b), PennDOT is responsible for reviewing and approving SEPTA's Rail ASP. PennDOT must oversee SEPTA's execution of the Rail ASP and enforce its implementation

[33] See PTSCTP website for more information.

through CAPs or other means, as necessary. PennDOT must ensure that SEPTA's Rail ASP aligns with the requirements specified in § 5329(d), including the SMS requirements in Part 673. PennDOT does not oversee SEPTA's Bus ASP.

An ASP delineates how a transit agency will implement an SMS to manage its safety performance. SMS continuously monitors transit operations, collects relevant data, and provides opportunities for transit management to identify and mitigate safety risks before they lead to fatalities, injuries, or major incidents. SMS equips transit agencies with processes and management tools to analyze data from everyday operations, identify trends that may precede incidents or accidents, take measures to mitigate risks, and validate the effectiveness of their safety approach. SMS also encompasses assurance, investigation, and audit activities, along with promoting communication and training to enhance the organization's overall safety performance and culture. As stipulated in Part 673, SEPTA's SMS must incorporate four key components: Safety Management Policy, Safety Risk Management, Safety Assurance, and Safety Promotion.

During the SMI, FTA and PennDOT discussed shared concerns regarding SEPTA's slow implementation of SMS. PennDOT has not yet approved SEPTA's 2023 Rail ASP due largely to SEPTA's inability to meet PennDOT's program requirements for Safety Assurance activities, like CAP management and accident investigation, in a timely and quality manner, and to SEPTA's lack of an effective and systemwide SRM program. Further, as documented in Category 2 of this report, PennDOT recognizes that SEPTA's System Safety Division does not have the resources to initiate the Authority's transition to SMS.

During the SMI, FTA and PennDOT reviewed SEPTA's implementation of its SRM process, highlighting challenges and weaknesses in SEPTA's current capabilities. At the time of the SMI, PennDOT was working with SEPTA through the comment resolution process, to ensure that the 2023 Rail ASP includes an SRM process that is feasible for SEPTA.

Furthermore, through the course of its oversight activities, PennDOT now uses Data or Information for Hazard Identifications (DIHIs) to draw SEPTA's attention to information or data requiring consideration through SEPTA's SRM process. PennDOT engaged in this activity to bolster SEPTA's use of SRM techniques. PennDOT issued DIHIs and expected SEPTA to respond through its SMS and SRM process, including safety risk assessment. If SEPTA's analysis determined that the DIHI met the hazard reporting thresholds set out in the Rail ASP, SEPTA would be obliged to follow PennDOT's CAP process.

PennDOT also identified accident investigation as another crucial SMS process, part of Safety Assurance, where SEPTA faced challenges. Over the past year, PennDOT worked with SEPTA to increase staffing for accident investigators, with seven new investigators joining SEPTA's System Safety team in 2023. These investigators were tasked with supporting the Authority in managing the 400 to 500 accident investigations SEPTA conducts annually across all modes. Additionally, PennDOT developed checklists to guide its review of the approximately 200 investigation reports related to rail transit modes each year. The results of these checklists were shared with SEPTA in memos, along with explanations of determinations regarding CAP

approval or disapproval. During the SMI, PennDOT was able to approve less than 50 percent of the initial reports submitted by SEPTA, primarily due to insufficient causal factor information, analysis, and CAP documentation.

PennDOT also noted that SEPTA's internal safety audits, another critical Safety Assurance function, were not as robust as needed to identify and address safety issues effectively. PennDOT attended most SEPTA internal audits and identified issues not included in the audit reports. However, even with this feedback from PennDOT, SEPTA did not issue many findings requiring corrective action because of its internal audits. PennDOT required SEPTA to develop a CAP related to this gap in SEPTA's Internal Audit program, but progress in addressing it has been slow.

FTA acknowledges PennDOT's efforts to oversee SEPTA in developing an SRM capability and in implementing SMS. However, more direct action from PennDOT is needed to ensure timely and effective implementation of key SMS processes, including SRM. Robust SMS processes are essential for SEPTA to address its current safety concerns and the outcomes of this SMI.

Despite PennDOT’s efforts to date, SEPTA has not established the necessary structures to ensure effective SMS implementation, timely responses to PennDOT's SSO program, or resolution of numerous safety deficiencies.

Required Action

Finding 5.2	**PennDOT Must Expand Activities to Address SEPTA’s Lagging SMS Implementation**
Required Action 2	Within 90 days of issuance of this report, PennDOT must require SEPTA to develop a detailed and expedited milestone schedule for its SMS implementation plan, including new resources to support its SMS program as specified in SD 24-2 and oversee its implementation. Within 90 days of issuance of this report, PennDOT must begin to provide monthly status reports to FTA. PennDOT must submit the SMS implementation plan with assigned resources and monthly status reports to FTA for review, approval, and implementation monitoring.

Category 5 Finding 3. PennDOT Has Not Expedited Action to Ensure SEPTA's Program for On-Track Safety Is Sufficient to Ensure Worker Safety

Background

Since 2019, SEPTA has experienced two major accidents involving collisions with workers on the rail transit right-of-way, resulting in the death of one worker and the serious injury of three others. One of these accidents occurred on November 4, 2023, during FTA's SMI. Since 2020, SEPTA also has experienced 16 near misses involving workers on the right-of-way, which have been reported to PennDOT's SSO program, including four near misses in 2023.

FTA's SMI team acknowledges that SEPTA's on-track safety program incorporates several industry-leading practices and generally complies with the regulations outlined in FRA's 49 CFR Part 214. Furthermore, SEPTA's on-track safety training and certification program features comprehensive discussions on protection methods and three hours of field demonstrations on the actual right-of-way.

Nevertheless, given the high speed of trains and equipment on the SEPTA system, the double track system on the BSL, and the inherent challenges of working on the rail transit right-of-way in year-round weather conditions, FTA remains concerned that under SEPTA's current resource constraints, work crews with limited supervision may not be able to follow all on-track safety procedures, may be more likely to take shortcuts, or may not have the expert supervision required to ensure their safety.

Through the SMI, FTA confirmed that PennDOT participated in investigations of all near misses related to the on-track safety program since 2020. Moreover, PennDOT has conducted audits of SEPTA's on-track safety program components during its triennial audits of other programs in 2021 and 2022, as well as field inspections in 2023. However, PennDOT has not conducted a triennial audit that sufficiently assesses this safety-critical program.

Required Action

Finding 5.3	**PennDOT Has Not Expedited Action to Ensure SEPTA's Program for On-Track Safety Is Sufficient to Ensure Worker Safety**
Required Action 3	PennDOT must conduct an audit of SEPTA's on-track safety program to occur no later than 60 days after the issuance of this report. This audit must thoroughly assess SEPTA's implementation of its RWP program, with a focus on the adequacy of on-track safety standards, the effectiveness of job briefings and personal protective equipment, the comprehension of on-track responsibilities and communication by workers, and the proper execution of levels of protection, including rules for Qualified Protection Employees, Flagpersons, and Watchpersons and Advanced Watchpersons. Additionally, PennDOT must review the implementation of SEPTA's right to challenge rules and evaluate the sufficiency of staffing, including instructors and supervisors responsible for overseeing program effectiveness. PennDOT must issue findings requiring corrective action as necessary. PennDOT must submit the audit report (and corrective actions if applicable) to FTA for review, approval, and implementation monitoring.

Category 5 Finding 4. Expedited Safety Oversight Is Required for SEPTA's Control Center

Background

In Category 2 of this report, FTA details its findings that SEPTA's Rail Control Center is significantly under-resourced and that SEPTA does not use industry-standard rules reviews and scenario testing activities to assess the performance of its dispatchers and controllers. FTA also found that there is no designated trainer for the Control Center, despite the critical importance of this function to the future staffing of the Control Center.

FTA recognizes that PennDOT conducts biweekly inspections of the rail transit Control Center and routinely monitors the performance of the controllers and Assistant Directors as they dispatch service. FTA finds, however, that additional examination is needed to determine the rail transit Control Center's capabilities, strengths, and areas for safety improvement for both the Light Rail and MFL-BSL desks and to ensure proper resources and capabilities to support safe revenue operations, monitor rules compliance and performance, and respond safely to accidents and emergencies.

Required Action

Finding 5.4	**Expedited Safety Oversight Is Required for SEPTA's Control Center**
Required Action 4	Within 90 days of issuance of this report, PennDOT must conduct an audit of rail operations to focus on the SEPTA Control Center. The audit must examine staffing, training, hours of service and fatigue, radio discipline, rules compliance, and issue findings requiring corrective action as necessary for MFL/BSL desks as well as Light Rail/NHSL desks and management. PennDOT must submit the audit report (and corrective actions if applicable) to FTA for review, approval, and implementation monitoring.

Category 5 Finding 5. PennDOT Must Expand Activities to Ensure SEPTA's Emergency Communication Devices Are Operable

Background

An emergency call box (ECB) is a communication device available for passenger use to call a central control center in the case of immediate or emergency assistance. The American Public Transportation Association *15. Standard for Emergency Telephone and Passenger Assistance Device Inspection, Testing and Maintenance* (June 8, 2003) Section 3.7[34] lists minimum steps and standards for ECBs and other emergency telephone and passenger assistance devices, including "inspect emergency telephones and passenger assistance devices for proper condition and operation including visual indications… [and] test each emergency telephone/passenger assistance device for proper operation."

SEPTA's *Emergency Management Operations Plan* explains that Station ECBs "are installed on station platforms of the MFL and BSL, and permit passengers to summon police by pushing an activation button on the fix-mounted ECB box. When the ECB button is activated, a computer display in the Police radio room will indicate the exact location of the affected ECB. SEPTA Police can then speak directly with the respondent via the ECB."[35]

During the SMI, FTA tested multiple ECBs on SEPTA's BSL rail transit station platforms and found the devices did not work as intended. In most instances, the control center respondent could hear the individuals on the platform, however, the individuals on the platform could not hear the respondent. Further, over a six-month period from June 2023 to December 2023, PennDOT also identified non-functioning emergency callboxes at SEPTA stations on seven separate occasions.

[34] American Public Transportation Association *15. Standard for Emergency Telephone and Passenger Assistance Device Inspection, Testing and Maintenance* Section 3.7, page 15.5.
[35] SEPTA *Emergency Management Operations Plan* (November 2018), page 64.

On December 15, 2023, PennDOT directed SEPTA to take immediate action to assess the state of this system, including "conducting a thorough safety risk assessment that will rely on a full investigation of emergency callboxes, to include onsite inspections and interviews to answer questions regarding emergency callbox ownership, overall condition, proper safety communication, and current maintenance activities." PennDOT also "expects that SEPTA will produce a full itinerary of existing emergency callboxes with a current assessment of the functionality of each callbox."

While FTA appreciates PennDOT's immediate action letter, FTA finds that PennDOT must do more to use its authority to ensure the repair or replacement and proper functioning of this critical safety system in a timely manner.

Required Action

Finding 5.5	**PennDOT Must Expand Activities to Ensure SEPTA's Emergency Communication Devices Are Operable**
Required Action 5	PennDOT must audit all emergency communication devices on SEPTA 's BSL within 90 days and require and verify corrective action to repair or replace defective equipment. PennDOT must submit the audit report (and corrective actions if applicable) to FTA for review, approval, and implementation monitoring.

Category 5 Finding 6. PennDOT Has Not Ensured SEPTA Meets ASP and Commonwealth AED Requirements

Background

Automated External Defibrillators (AEDs) are portable, potentially life-saving devices that deploy an electric shock to an individual's heart when experiencing an abnormal heartbeat or sudden cardiac arrest. The devices are designed for use by the public or willing bystanders, requiring no training.

There are 110 AEDs placed throughout SEPTA located in SEPTA Headquarters, all Authority maintenance facilities, key passenger stations, transit police vehicles, specific utility fleet vehicles, and transportation districts. Each unit is supplied with a spare set of electrodes, operating instructions, battery, carry case, and orientation video.

SEPTA's 2022 Rail ASP confirms that SEPTA's System Safety Division is responsible for the maintenance, testing, and tracking of the AEDs on SEPTA property in accordance with the manufacturer's operational guidelines.[36] This activity is managed by SEPTA's System Safety Division with the help of a third-party vendor.

Pennsylvania requires maintenance, training, EMS activation, and post-use reporting requirements on AED programs. Specifically, the Commonwealth of Pennsylvania Judicial Code (42 PA Consolidated Statutes) – *Good Samaritan Civil Immunity for Use of Automated External Defibrillator and Nonmedical Good Samaritan Civil Immunity* Act (8331.2.b) states, "Any person who acquires and maintains an AED for use in accordance with this section shall…(2) Maintain and test the AED according to the manufacturer's operational guidelines."

During the SMI, FTA observed SEPTA workers performing safety briefings at the beginning of each meeting, including a discussion of the location of the closest AED. However, during interviews with System Safety Division representatives who are responsible for overseeing SEPTA's AED contract, it was discovered that as of December 2023, the contract to perform AED inspections and maintenance services had changed. Interviewees stated that there is now a month-to-month contract in place, though it is not clear to what level the contractor is inspecting and maintaining AEDs for the Authority. During the SMI, it appeared that PennDOT first became aware of this situation. Given that this is potentially lifesaving equipment, whose maintenance and inspection are specified in the ASP, FTA finds that PennDOT must do more to oversee SEPTA's management of this critical equipment.

[36] Rail ASP, Chapter 18, Safety Communication, sub-section 18.1.2.17 First Aid (page 157).

Required Action

Finding 5.6	**PennDOT Has Not Ensured SEPTA Meets ASP and Commonwealth AED Requirements**
Required Action 6	Within 30 days of issuance of this report, PennDOT must direct SEPTA to assess the current condition of its AED inspection and service program and make any changes or require corrective actions as needed to ensure compliance with Pennsylvania statutes and SEPTA's ASP. PennDOT must submit the assessment (and corrective actions if applicable) to FTA for review, approval, and implementation monitoring.

Category 5 Finding 7. PennDOT Must Do More to Require SEPTA's REE&M Department to Control Safety-Critical Documents

Background

The remaining findings to PennDOT in Category 5 focus on key REE&M activities and needed improvements to ensure development and availability of current procedures at maintenance facilities; to formalize tool calibration to ensure safe vehicle maintenance and operating conditions; to support quality assurance and control programs that address compliance with safety rules; and to assess the effectiveness of ongoing initiatives to include resources available in REE&M to ensure vehicle maintenance, inspection, and safe conditions.

Rail transit vehicle maintenance plays a critical role in ensuring the safety of SEPTA's rail transit system:

- **Preventive maintenance and inspection** – Performing routine and scheduled maintenance like brake inspections, HVAC checks, wheel truing, electrical inspections, as well as visual inspections helps detect and mitigate safety issues due to component wear, fatigue, or failure before they lead to accidents.

- **Corrective maintenance** – Diagnosing and promptly fixing reported or identified defects, malfunctions, and damage through activities like troubleshooting, testing, part replacement, and functionality checks is essential to keeping equipment operating safely and reliably.

- **Configuration and quality control** – Ensuring vehicles adhere to design specifications and meet tight tolerances related to weight, clearances, sensor calibrations, as well as verifying the quality of replacement components helps optimize safe vehicle performance.

- **Upgrade and retrofit installation** – Properly outfitting railcars and locomotives with safety enhancements like electronic stability control, positive train control, cameras, lighting improvements according to rigorous, controlled procedures is key to realizing their intended risk reduction benefits.

- **Data monitoring and analysis** – Continually monitoring vehicle health data and maintenance records to spot emerging fleet-wide issues and trends can enable early intervention before small problems cascade into safety incidents. It also provides feedback to refine maintenance programs over time.

The extensive mechanical complexity of SEPTA's rail transit vehicle fleet means that an underlying foundation of consistent, high-quality maintenance is vital to enable intended functionality, extend longevity, and prevent safety issues stemming from equipment degradation or failures.

Procedure Distribution and Control

Procedures of all types, including vehicle maintenance procedures, present the purpose and instructions for correctly completing a task in a productive, consistent, and safe manner. SEPTA's Rail ASP lists maintaining safety documentation and maintenance procedures as a specific goal of the plan.[37] PennDOT monitors SEPTA's rail maintenance procedures and practices through triennial audits and field observations.

During field reviews, FTA observed that some maintenance facility locations had outdated manuals at workstations. When questioned about the presence of these manuals, SEPTA interviewees explained that the Authority was in the process of removing them. According to SEPTA workers, SEPTA's Vehicle Technical Information Library (VTIL) provides the most current information on maintenance activities and requirements, and maintainers have been informed to use the VTIL as the primary source of information. Notwithstanding, having outdated printed procedures and manuals throughout the shops may cause confusion for workers on which procedures are the most up to date or force maintenance personnel to use the outdated manuals if the VTIL is out of service.

SEPTA has the *Safety Awareness Manual for Yards and Shops* (July 25, 2018), however, information provided in the manual is noted as having been modified for training purposes, and SEPTA workers indicated that the manual only exists for the purpose of simplifying difficult rules and procedures. They clarified that the manual is not provided as a rulebook, and while it is heavily used by maintenance workers, workers explained that there is some uncertainty regarding its status as an authoritative and current voice on how to perform certain maintenance procedures.

Document control is critical for systematically managing documents and files for accessibility, security, and version organization. Sound document control and management practices allow

[37] Rail ASP, Section 1.4, page 18.

transit workers to easily find and reference accurate plans, procedures, and records needed to do their jobs. A system for document control also establishes methods for creating, revising, approving, distributing, and archiving documents and files effectively.

Per § 673.27(b), "A transit agency must establish activities to: (1) monitor its system for compliance with and sufficiency of, the agency's procedures for operations and maintenance." Part 673.31 requires, "A transit agency must maintain documents that are included in whole, or by reference that describe the program, policies, and procedures the agency uses to carry out its Public Transportation Agency Safety Plan."

SEPTA's Rail ASP states that Engineering "coordinates the development of an Engineering Change Notice (ECN) or Automotive Engineering Bulletin (AEB) and appropriate drawings, documentation and/or manuals. The [ECN] documents the genesis and application of the change and is prepared and distributed to all affected parties." System Safety reviews ECNs for SEPTA rail vehicle maintenance inspections and overhauls.

SEPTA's *Rail Equipment Engineering Procedure* (REE 3.0) (April 1, 2016), details the process for initiating, approving, revising, distributing, and filing an ECN specifying that ECNs. ECNs go into effect, "following the expiration of the Carbuilder warranty, [at which time] Vehicle Engineering becomes responsible for railcar configuration management via the ECN program."[38]

During SMI interviews, a representative from REE&M explained that the most current REE&M procedure is what the training department is using. Discussions with the Training Department clarified that Vehicle Engineering manages the governing REE&M documentation such as procedures and formal changes to procedures.

SEPTA informed the FTA team that the current ECN change management procedure is to be replaced with one that identifies: who can initiate a change; the use of Engineering Change Request (ECRs); the engineering review process for cost-effectiveness and feasibility; engineering and safety reviews to ensure new hazards are not introduced; and how the change is evaluated using a change control review board.

FTA finds that SEPTA's REE&M document control and management should be strengthened to include version and access control as well as clarifying stakeholders who may initiate ECNs. PennDOT needs to oversee enhancements to REE&Ms document and management control practices to ensure maintenance transit workers are referencing current maintenance procedures.

[38] *Rail Equipment Engineering Procedure* (REE 3.0) (April 1, 2016), Section 1, page 2

Required Action

Finding 5.7	**PennDOT Must Do More to Require SEPTA's REE&M Department to Control Safety-Critical Documents**
Required Action 7	Within 60 days of issuance of this report, PennDOT must direct SEPTA REE&M to ensure the removal of outdated manuals and procedures located in the shops and garages. PennDOT must submit evidence verifying the removal of outdated information in shops and garages to FTA for review and approval, and implementation monitoring.
Required Action 8	Within 90 days of issuance of this report, PennDOT must review REE&M's method for distributing SOPs or procedures as Notices on bulletin boards and direct SEPTA REE&M to formalize existing SOPs or procedures into a more trackable and comprehensive media available to the employees. PennDOT must submit the revised practices and supporting documentation to FTA for review, approval, and implementation monitoring.
Required Action 9	Within 150 days of issuance of this report, PennDOT must direct SEPTA REE&M to complete and issue its revision to SEPTA's document management, management of change, and configuration control procedures. PennDOT must submit both its direction to SEPTA and SEPTA's revised procedures to FTA for review, approval, and implementation monitoring.

Category 5 Finding 8. **PennDOT Has Not Ensured that SEPTA's REE&M Department Implements a Formal Safety Rules Compliance Program**

Background

Per § 673.27(a), transit agencies must develop and implement a safety assurance process. Further, § 673.27(b) notes that agencies must establish activities for monitoring system compliance with agency procedures for operations and maintenance, and evaluating if those procedures are sufficient. While SEPTA's Rail Transit ASP, Section 10.2 outlines rail rules compliance programs focused on operations and system safety, it lacks clear reference to a formal set of procedures for monitoring compliance of rail vehicle maintenance activities.

During SMI interviews and field observations, SEPTA vehicle maintenance personnel confirmed that the Authority does not have a formal rules compliance procedure for REE&M. SEPTA vehicle maintenance personnel conveyed that rules and procedures compliance for REE&M workers is presently carried out through random supervisor observation and shadowing. There is no schedule to ensure each worker receives a routine assessment, and results are not formally documented.

In reviewing field operations, FTA officials took note of the presence of posted REE&M maintenance safety protocols and procedures in facility bulletin boards. SEPTA representatives indicated that formal rulebooks are not furnished to REE&M workers. Expectations surrounding protocols appear to be communicated through the postings coupled with information available through the Vehicle Technical Information Library system. Evidence of robust, regular training or independent verification of procedural compliance was lacking. Moreover, the absence of clearly documented REE&M standards for various maintenance tasks renders methodical, reliable compliance verification impractical.

Enhancing the formality and rigor surrounding SEPTA's REE&M rules and procedures compliance via thorough record keeping and analysis would bolster SEPTA's overarching SMS. PennDOT is generally aware of REE&M's approach to rules compliance for its vehicle maintenance personnel. Given recent safety events, FTA finds that PennDOT must take steps to ensure the REE&M function develops and rolls a formal rules compliance program.

Required Action

Finding 5.8	**PennDOT Has Not Ensured that SEPTA's REE&M Department Implements a Formal Safety Rules Compliance Program**
Required Action 10	Within 150 days of issuance of this report, PennDOT must direct SEPTA REE&M to formalize its safety rules compliance program. PennDOT must submit both its direction to SEPTA and the formalized program to FTA for review, approval, and implementation monitoring.

Category 5 Finding 9. **PennDOT Can Do More to Ensure Independence of REE&M Department's QA/QC Program for Safety-Critical Inspections and Maintenance**

Background

Quality Assurance (QA) refers to processes in place to verify that goods, designs, products, and equipment meet standards defined by the Authority, aiming to prevent problems proactively. Quality Control (QC) examines received items and products to confirm they align with expectations and lack defects or issues. Many items assessed in a typical QA/QC program relate to safety-critical system components.

SEPTA's Rail ASP cites the Vehicle Engineering Maintenance (VEM) Rail Quality Assurance Materials Inspection Guidelines, which "establish a scope and procedure for materials inspections performed by [VEM-Rail] Quality Assurance (QA) personnel... The QA group is responsible for performing receipt inspections on Purchased Materials delivered to SEPTA rail storerooms and material warehouse locations."

During the SMI, FTA learned that SEPTA's current QA/QC program centers primarily on vendor surveillance for parts procurement. At present, there is no independent examination of the execution of core rail vehicle preventive and corrective maintenance activities from a quality standpoint. These maintenance functions directly impact vehicles' safe operating conditions.

Oversight of maintenance quality is delegated to frontline maintenance managers who sporadically inspect vehicles that recently underwent preventive maintenance. They assess whether mandated protocols were implemented. Inspection volumes vary based on the number of vehicles assigned to each facility. Checklist-based inspection outcomes are documented, archived, and tracked on the Vehicle Technical Information Library (VTIL) system for review by upper management.

This approach does not ensure independent QA/QC assessments of maintenance activities, instead leaving leadership in the department responsible for maintenance with assessing its quality.

SEPTA has acknowledged this sphere as one requiring improvement. REE&M personnel informed the FTA team of plans to onboard a dedicated QA/QC group consisting of approximately eight managers. This team would conduct third-party quality verification of maintenance practices. However, the exact timeline, resources, and structure to stand up this group remain undefined.

SEPTA's current REE&M QA/QC program is incomplete and lacks rigor to ensure safety-critical parts, equipment, and systems are inspected and maintained as required. To ensure SEPTA establishes a robust, comprehensive quality inspection program for rail vehicle maintenance, the Pennsylvania Department of Transportation must maintain effective oversight.

Required Action

Finding 5.9	**PennDOT Can Do More to Ensure Independence of REE&M Department's QA/QC Program for Safety-Critical Inspections and Maintenance**
Required Action 11	Within 180 days of issuance of this report, PennDOT must assess the adequacy of SEPTA REE&M's QA/QC program, to include capital programs, supply chain acquisitions, operations, and maintenance, and determine if additional efforts are warranted and require corrective actions are needed. PennDOT must submit the assessment (and corrective actions if applicable) to FTA for review, approval, and implementation monitoring.

Category 5 Finding 10. PennDOT Must Expand Activities to Oversee Tool Calibration

Background

Transit infrastructure and equipment, including rail vehicles, require specialized tools for effective maintenance. Some tools, such as torque wrenches and meters, need special care and calibration to confirm the equipment is performing precisely and/or found within acceptable tolerance related to its specific application. With use, certain tools may lose accuracy or present inaccurate measurements. A calibration program keeps tools and equipment reliable and within specifications.

Although calibration practices exist for torque wrenches, based on interviews and observations, some tools, such as meters and terminal crimping tools, are not being routinely tracked and checked for calibration. A crimping tool was observed in the NHSL shop and when asked about the calibration process for this tool, it was expressed by a SEPTA transit worker that they were not aware this tool needed calibration.

Further, SEPTA had a calibration program in 2019 that the FTA team was able to verify by outdated tags on some equipment. That program was interrupted by a malware attack in August 2020. The attack affected software, files, and records Authority-wide and destroyed calibration records. SEPTA has been working to restore or replace the corrupted files. SEPTA informed the FTA team that they are in the process of restoring the calibration program.

Some locations had their own unique protocols in place for tool calibration. SEPTA's Machine Shops at Fern Rock and Woodland complete their own tool calibration, and the Electronic Shop at Woodland uses a third-party vendor to ensure test equipment is calibrated. These facilities were not affected by the malware event since documentation for calibration tracking is maintained locally.

FTA recognizes that SEPTA does not have a system-wide tool and equipment calibration program for rail and bus vehicle maintenance. PennDOT needs to ensure steps are taken by SEPTA to institute a comprehensive program for tool calibration.

Required Action

Finding 5.10	**PennDOT Must Expand Activities to Oversee Tool Calibration**
Required Action 12	Within 180 days of issuance of this report, PennDOT must direct REE&M to formalize calibration practices for precision instrumentation/tooling. PennDOT must submit its direction to SEPTA and the formalized program to FTA for review, approval, and implementation monitoring.

Category 5 Finding 11. PennDOT Must Enhance Oversight of REE&M Department to Ensure Capability to Perform Safety-Critical Functions

Background

REE&M Personnel Resources

Rail Equipment Engineering & Maintenance is housed within SEPTA Rail Operations and Maintenance. As of the SMI, REE&M consisted of five groups: Engineering Rail Vehicles; Engineering New Vehicles; Maintenance Railroad; Maintenance Metro Rail; and Maintenance Electronics Back Shops.

Rail Vehicle Equipment Maintenance is "responsible for all inspection and maintenance activities for SEPTA's multimodal [rail] fleet."[39] As of October 2023, Rail Vehicle Equipment Maintenance for heavy rail and trolley vehicles, performed under the Maintenance Metro Rail group, was responsible for over 500 rail vehicles supported by nine shops and car-houses.

Rail Vehicle Engineering is responsible for: new vehicle procurement, vehicle overhaul initiatives, failure and trend analysis, and supporting modal shops with fleet modifications, including changes to maintenance inspection procedures and manuals. Significant projects currently underway at SEPTA include:

- **Trolley Modernization** – Transforming the nation's largest trolley network to meet the needs of riders for improved service through new longer vehicles with low floors and ramps, wider pathways, enhance communications technologies; new on-street, accessible stations to foster safety and operation improvements; and line extensions to expand trolley services.

- **M4 Structural Repairs** – Ongoing management of major repairs for the M4 vehicle including but not limited to transom weld modification, battery storage upgrade, draft gear study, as well as several ongoing intensive inspections on gusset weld, side sills, bolsters, and more.

- **M5 Car Replacement** – Replacing of the aged M4 vehicles operating on the MFL that are over 25 years old and require substantial maintenance for operation.

- **Presidents' Conference Committee (PCC) Restoration Project** – Restoring SEPTA's 18 PCC cars out of the Woodland shop to return to service on Route 15.

- **Vacuum Train** – Procuring one or more vacuum trains for cleaning metro rail tacks.

During the SMI, REE&M staff listed top concerns as: hourly staffing shortages, organizational changes, delays in receiving materials, availability of training; and communication limitations with frontline transit workers/mechanics. With respect to staffing shortages, it was identified

[39] Rail ASP, Section 5.8, page 52.

that senior transit workers with significant institutional knowledge, technical skillsets, and mentoring capabilities were retiring at a rate that outpaced onboarding qualified candidates.

The numbers of budgeted vs. actual staffing in Table 4 below were communicated to FTA in October 2023 specific to REE&M rail vehicle maintenance staff.

Line	A Payroll		B Payroll		Hourly		Total Budgeted	Number of Vacancies (Percent Vacant)
	Budgeted	Actual	Budgeted	Actual	Budgeted	Actual		
Green	13	14	3	3	119	118	135	**0 (0%)**
MSHL	2	2	0	0	16	12	18	**4 (22%)**
NHSL	2	2	1	1	21	20	24	**1 (4.2%)**
BSL	13	13	2	2	162	148	177	**14 (7.9%)**
MFL	17	18	2	1	185	164	204	**21 (10.3%)**
Totals	**47**	**49**	**8**	**7**	**503**	**462**	**558**	**40 (7.2%)**

Table 4. REE&M Staffing and Vacancy Rates by Rail Line

With respect to New Vehicle Engineering, the group is organized to have 18 full time positions. At the time of SMI discussions, in recognition of its need for the additional capacity, SEPTA had recently added six positions and were in the hiring process.

In addition to a lower overall budgeted number of positions, on top of vacancies, compounding the REE&M staffing issue is the expectation of a high level of turnover in the next one to three years, particularly from their experienced craftsmen and skilled positions.

Training

The Training Department group responsible for Vehicle Maintenance technical training is housed under SEPTA Human Resources. Training courses and skills are provided for technical topics such as: overhead crane safety, air brake systems, door systems, trucks; propulsion, high voltage system, low voltage system, fasteners, and hand tools; cab controls, carbody interior, carbody exterior, welding, and more. Training courses and materials are largely developed in-house by SEPTA instructors. Training programs include initial and refresher trainings, mentorship programs, on-the-job training, and return to service trainings. SEPTA's Training Department provides full certifications and recertification training for Annual State Inspection.

During the SMI, interviews with the training staff revealed that SEPTA vehicle maintenance instructors were overworked, and the Authority needs more technical instructors for all vehicle modes. Additionally, challenges with hiring skilled maintenance transit workers are impacting training because hiring new transit workers with different or lesser skill sets involves more training than in the past, which impacts instructor availability for other trainings.

REE&M management explained that there are a lot of new and inexperienced staff that need regular training and interaction. For instance, according to management, about 70 percent of the MSHL maintenance staff are inexperienced, with a couple individuals expected to retire in

2024. Recruiting qualified maintenance candidates proves to be more challenging now than ever before, and SEPTA is working to refine the hiring process to bring more potential candidates in the door. When candidates are selected and brought on, many require more extensive training to attain necessary skills to complete their jobs. As a result, it is difficult for the training group and instructors to meet the demands for training new mechanics and maintenance transit workers.

Additionally, due to staffing shortages, instructors have not been able to maintain follow-up activities with new hires and field reviews on other technical topics. These activities verify transit workers are applying their training and skills correctly as well as promote confidence in the workforce. For instance, first-class mechanics need more time with troubleshooting, and instructors in the field could support this demand in addition to other ad-hoc training needs as they arise. SEPTA staff explained that three to five additional instructors would be greatly beneficial in addressing the challenges and demands.

REE&M is faced with more work and projects than before, yet budgeted staffing totals have been reduced. Likewise, technical training instructors knowledgeable in rail vehicle maintenance are limited while demand increases. PennDOT's SSO program monitors this situation, but PennDOT needs to do more to ensure that SEPTA sufficiently resources its rail vehicle maintenance group and is capable of maintaining SEPTA vehicles in safe condition.

Required Action

Finding 5.11	**PennDOT Must Enhance Oversight of REE&M Department to Ensure Capability to Perform Safety- critical Functions**
Required Action 13	Within 150 days of issuance of this report, PennDOT must review and assess REE&M staffing and determine if additional hiring efforts are warranted and require corrective action as needed. PennDOT must submit the assessment (and corrective actions if applicable) to FTA for review, approval, and implementation monitoring.
Required Action 14	Within 210 days of issuance of this report, PennDOT must review and assess the sufficiency of REE&M training and require corrective action as needed. PennDOT must submit the assessment (and corrective actions if applicable) to FTA for review, approval, and implementation monitoring.

Appendix A: List of Findings and Required Actions

FTA makes 16 total findings and 24 required actions in three categories addressed to SEPTA.

Category 1 – Transit Worker Safety

Finding 1.1	**SEPTA Must Expand Activities to Protect Transit Workers from Assault**
Required Action 1	Within 90 days of issuance of this report, SEPTA must develop an action plan that includes actions to be taken, required resources, dedicated funding sources, milestones to implement, and oversight activities to safeguard the welfare of employees on the SEPTA system from assault on rail transit and bus modes. At a minimum, this plan must consider the following: • Redesign of operator cabs on buses and trolleys to provide greater protection for operators, to include current fleet cab changes, and what is to be required for the new trolleys and buses that are in the acquisition process. • Coordinated approach with local law enforcement for the management of silent bus alarm notifications to ensure rapid and coordinated response. • Enhanced approach to bus patrol and security for bus operators, including uniformed presence on buses and at transfer centers. • Enhanced approach to managing security for end-of line-locations on bus and rail transit, including uniformed presence. • Enhanced support for full build-out of SEPTA's SCOPE Program. • Enhanced training for SEPTA employees to equip them with the necessary skills to handle and prevent incidents of assault and harassment. • Public education campaign to raise awareness among passengers about the importance of maintaining a safe and respectful environment and importance of SEPTA employees for the region. • In coordination with Finding 3, enhanced data collection and reporting on incidents of assault to be regularly shared with relevant authorities to inform ongoing safety initiatives. SEPTA must submit the action plan to FTA for review, approval, and implementation monitoring.
Required Action 2	Beginning 30 days after FTA's approval of the action plan in Finding 1, Required Action 1 (Required Action FTA-24-1-001-1 of Special Directive 24-1), SEPTA must provide monthly progress reports on its implementation of the action plan to FTA.
Finding 1.2	**Clarification Needed to Ensure Frontline Transit Workers Understand Action They Must Take in Response to Fare Evasion**

Required Action 3	Within 30 days of issuance of this report, SEPTA must issue a communication clarifying expectations for transit workers regarding the "Check and Request" practice, currently in SEPTA's Operator Rule Book, specific to the response to and recording of fare evasion. SEPTA leadership also must ensure that expectations are actively communicated to all SEPTA frontline transit workers and that SEPTA transit workers are provided the opportunity to ask questions. SEPTA must submit a draft of the communication to FTA for review and approval, the issued communication, documentation verifying dissemination of the communication to all frontline employees, and the mechanism used to discuss the communication and provide employees with the opportunity to ask questions and have them answered.
Finding 1.3	**Limited Collection of Information on Operating Conditions that Lead to Safety Concerns for Frontline Workers**
Required Action 4	Within 60 days of issuance of this report, SEPTA must conduct an analysis of the current process used to collect information from transit workers on assaults and safety concerns in passenger service, including use of Form 5039, calls to the Control Center, and other employee reporting programs. SEPTA must submit this analysis to FTA for review and approval. Within 30 days of FTA approval of the analysis, SEPTA must develop an action plan and implementation schedule to improve collection of this information from transit workers. SEPTA must submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.
Required Action 5	Within 90 days of issuance of this report, SEPTA must begin conducting monthly analysis of the information provided by SEPTA workers on assaults and safety concerns in passenger service. FTA expects that monthly reporting will improve in detail as the action plan in Finding 3, Required Action 4 (Required Action FTA-24-1-003-1 of Special Directive 24-1) is implemented. SEPTA must share the results of its analysis monthly with SEPTA Police and SEPTA Transit Managers for action and submit the monthly results to FTA.
Finding 1.4	**Qualified Protection Employees Need Additional Training and Routine Evaluation to Ensure Their Capabilities to Set Up Worker Protection**
Required Action 6	Within 60 days of issuance of this report, SEPTA must conduct an analysis of training, qualification, and routine evaluations provided to Qualified Protection Employees and develop an action plan and implementation schedule to ensure and continuously evaluate the capabilities of Qualified Protection Employees in setting up protections to provide transit worker safety in accordance with SEPTA's on-track safety program. SEPTA must submit the analysis, action plan and implementation schedule to FTA for review, approval, and implementation monitoring.

Category 2 – Capacity of SEPTA's System Safety Division and Control Center to Ensure Safe Operations

Finding 2.1	**Insufficient Resources in SEPTA's System Safety Division to Lead SMS Implementation, Address PennDOT Program Requirements, and Identify and Resolve New and Emerging Safety Concerns**
Required Action 1	Within 60 days of issuance of this report, SEPTA must revise its System Safety Division workforce assessment to focus on SMS implementation, including needed improvements in Safety Risk Management and Safety Assurance activities, compliance with PennDOT SSO program requirements, and SEPTA's capacity to address new and emerging safety issues. The workforce assessment also must address formalizing and fully staffing SEPTA's new SMS department within the System Safety Division to expedite SEPTA's SMS implementation and submit the workforce assessment to FTA for review and approval. Within 30 days of FTA approval of the analysis, SEPTA must develop an action plan and implementation schedule to address the results of the workforce assessment and submit it to FTA for review, approval, and implementation monitoring.
Finding 2.2	**SEPTA's Control Center Is Not Resourced to Meet Service Levels, Has No Dedicated Training Function, and Does Not Use Industry Standard Rules Reviews and Scenario Testing Activities**
Required Action 2	Within 60 days of issuance of this report, SEPTA must conduct a workforce assessment regarding personnel resources in the rail and bus transit OCCs required to dispatch, supervise, and ensure safety of fixed-route bus and rail transit service and submit to FTA for review and approval. Within 30 days of FTA approval of the assessment, SEPTA must develop an action plan and implementation schedule to address its findings. FTA expects that SEPTA may have to adjust service levels or engage in hiring to address the results of this assessment. SEPTA must submit this action plan and implementation schedule to FTA for review, approval, and implementation monitoring.
Required Action 3	Within 90 days of issuance of this report, SEPTA must establish a formal evaluation program for dispatchers and controllers. SEPTA must consider incorporating industry standard rules reviews and scenario testing activities to assess the performance of its dispatchers and controllers. SEPTA must submit this program to FTA for review, approval, and implementation monitoring.
Required Action 4	Within 120 days of issuance of this report, SEPTA must develop an action plan and implementation schedule to establish dedicated training resources for rail and bus transit controllers at the Control Center. SEPTA must submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.

Category 3 – Bus and Rail Transit Safety Issues Contributing to Safety Events

Finding 3.1	**High Fatigue Environment for Rail and Bus Transit Workers**
Required Action 1	Within 90 days of issuance of this report, SEPTA must develop an action plan and implementation schedule to conduct a comprehensive review of SEPTA's policies and practices for managing the work hours and fatigue of rail and bus operators and maintenance workers. This review must examine SEPTA's current hours of service requirements, overtime regulations, labor agreements, policies on secondary employment, as well as medical review and clearance policies and fatigue management strategies. It should also assess current SEPTA practices related to scheduling work hours and overtime for these workers. SEPTA must submit the review to FTA for review and approval. Within 30 days of FTA approval of the review, SEPTA must modify its work scheduling system to ensure it provides rail and bus operators and maintenance workers with predictable work and rest cycles that consider human circadian rhythms, as well as sleep and rest needs. SEPTA must submit the action plan, implementation schedule, and revised work scheduling protocols/system to FTA for review, approval, and implementation monitoring.
Finding 3.2	**Ratio of Supervisors to Operators Creates Challenges in Overseeing Safety-Sensitive Functions in Passenger Service**
Required Action 2	Within 90 days of issuance of this report, SEPTA must assess the current ratio of supervisors to transit operators in its fixed-route bus, trolley, and heavy rail operations and submit the assessment to FTA for review and approval. Within 30 days of FTA approval of the assessment, SEPTA must develop an action plan to ensure adequate oversight for those transit operators performing safety-sensitive functions. SEPTA must submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.
Finding 3.3	**Training Program Does Not Ensure the Readiness of New Operators for Transit Service**
Required Action 3	Within 120 days of issuance of this report, SEPTA must conduct an analysis of the adequacy of training resources and submit to FTA for review and approval. Within 30 days of FTA approval of the analysis, SEPTA must develop an action plan and an implementation schedule to address deficiencies noted by FTA. The analysis must review resources available to ensure new operators are not released into revenue service before they are ready, that they are equipped to manage the service environment, completion of all required retraining for every operator who needs it; and completion of regularly scheduled performance evaluations for each operator. SEPTA must submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.

Finding 3.4	**SEPTA Does Not Conduct Regular Performance Evaluations for Transit Operators**
Required Action 4	Within 120 days of issuance of this report, SEPTA must develop an action plan and implementation schedule to ensure that each bus and trolley operator regularly receives a performance evaluation focused on their ability to safely provide service. SEPTA must submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.
Finding 3.5	**SEPTA Does Not Provide Sufficient Support to Help New Operators Manage SEPTA's Operating Environment and Perform Duties Safely**
Required Action 5	Within 90 days of issuance of this report, SEPTA must provide an action plan and implementation schedule to provide training during all three shifts for new bus, trolley, and rail transit operators to work to ensure new workers' familiarity of the unique safety environment present during each of the shifts. This training must provide the opportunity for new operators to drive and be evaluated under nighttime conditions and in locations where they may be operating passenger service during their initial runs and routes. SEPTA must submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.
Required Action 6	Within 120 days of issuance of this report, SEPTA must develop an action plan and implementation schedule for a bus operator new hire safety performance mentoring and coaching program to improve learning for all operators and focus on positive contact with new operators after onboarding. SEPTA must consider the following when developing this plan: 1. Observations from instructors and/or operations leadership and supervision in coordination with SEPTA's peer mentoring program to validate the training the employee has received and to support their comfort in their new role. 2. Expansion of the peer mentoring program to include input from Local 234 regarding the assigned peer mentors, and to provide an opportunity for the operator to meet with the peer mentor bi-weekly to cover a safety scenario or safety method and receive helpful coaching. SEPTA must submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.

Finding 3.6	**Lack of Coordination and Prioritization on Intersection and Grade Crossing Safety and Detour Management**
Required Action 7	Within 45 days of issuance of this report, SEPTA must submit to FTA for review and approval a list of bus intersections and rail crossings that have had multiple accidents or incidents during the period 2018 through 2023 or have been determined to be at high risk for accidents. This list must include photographs and a summary of accident history for each location.
Required Action 8	Within 90 days of approval of the list developed in response to Finding 6, Required Action 7 (Required Action FTA-24-3-006-1 of Special Directive 24-3), SEPTA must develop an action plan and schedule to review the list of identified bus intersections and rail crossings for potential traffic safety improvements to be coordinated with PennDOT and local jurisdictions. To the extent feasible, these reviews should take place in coordination with the appropriate PennDOT district office and the local jurisdictions. SEPTA must submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.
Required Action 9	Within 150 days after issuance of this report, SEPTA must prepare an action plan and schedule to conduct an analysis of how current service design puts operators in difficult or unsafe situations (e.g., narrow roads with on-street parking, tight turns that cause the bus to roll over curb frequently, transfer center that requires the operator to put the bus in reverse without a spotter, lack of appropriate facilities or adequate lighting at end-of-line points). The analysis must identify potential improvements in service design to be implemented directly by SEPTA or coordinated with PennDOT and local jurisdictions as appropriate. SEPTA must submit the action plan and schedule to FTA for review and approval. SEPTA must submit the analysis for FTA review and acceptance. FTA will monitor implementation of the action plan and schedule, and subsequent analysis and improvements.
Required Action 10	Within 75 days after issuance of this report, SEPTA must develop an action plan and schedule to coordinate with city officials to develop a city construction detours management plan to reduce the impacts of construction detours on transit service. SEPTA must submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.

Finding 3.7	**SEPTA Does Not Address Safety Impacts of Multimodal Certifications**
Required Action 11	Within 150 days of issuance of this report, SEPTA must conduct an analysis of the bus and rail operator resources at the Victory District and determine impacts of multimodal certification for training, resources (vacancies), hours of service, safety incidents, and worker confidence in their ability to perform their job safely. SEPTA must submit the analysis to FTA for review and approval. Within 30 days of FTA approval of the analysis, SEPTA must develop an action plan to address the results of the analysis and submit the action plan and implementation schedule to FTA for review, approval, and implementation monitoring.
Finding 3.8	**SEPTA Has Not Formalized Policies for the Safe Movement and Securement of Transit Vehicles in Rail Transit Maintenance Facilities**
Required Action 12	Within 120 days of issuance of this report, SEPTA must complete development of the Rail Equipment Engineering and Maintenance Department's Standard Operating Procedures (SOP)/procedures for heavy rail and trolley vehicle securement and movement within and around rail transit maintenance facilities and ensure all transit workers responsible for such vehicle movement are trained on and issued the appropriate SOPs/procedures. SEPTA must submit the revised procedure(s), training documentation, and evidence of training completion and SOP/procedure issuance to FTA for review, approval, and implementation monitoring.
Finding 3.9	**Quality of SEPTA's Pre-trip Inspection Process Is Inconsistently Monitored**
Required Action 13	Within 90 days of issuance of this report, SEPTA must develop an action plan and schedule to enhance training and supervision regarding the conduct of pre-trip inspections, including a validation tool to measure pre-trip efficiency with employees. SEPTA must submit the action plan and implementation schedule for FTA review, approval, and implementation monitoring, and the validation tool for FTA review, acceptance, and implementation monitoring.
Finding 3.10	**SEPTA Faces Numerous Challenges with the Performance of Its Radio System**
Required Action 14	Within 120 days of issuance of this report, SEPTA must develop an action plan and schedule for radio enhancements to improve and monitor radio performance. This plan must include all intended capital projects to replace, repair, or upgrade radio system components. SEPTA must submit this plan and implementation schedule to FTA for review, approval, and implementation monitoring.

PennDOT

FTA makes 14 total findings and directs 17 required actions related to PennDOT's oversight of SEPTA's rail transit system.

Category 4 – PennDOT SSO Program Resources

Finding 4.1	**PennDOT's SSO Program Must Be Strengthened to Address the Size and Complexity of the SEPTA System**
Required Action 1	Within 45 days of issuance of this Special Directive, PennDOT must undertake a workload assessment for its SSO program devoted to SEPTA oversight, which must include additional available and accountable personnel resources. Specifically, the workload assessment must include activities and associated personnel to expedite oversight action regarding closure of SEPTA's open corrective action plans, improve both the timeliness and quality of SEPTA's safety event investigation reports adopted by PennDOT and ensure their sufficiency and thoroughness, work with SEPTA to oversee SMS implementation and effectiveness; and be prepared to respond to new and emerging safety concerns. The workload assessment must be submitted to FTA for review, approval, and implementation monitoring.
Finding 4.2	**PennDOT is Tracking Many Open SEPTA CAPs from SSO Audits, Accidents/Incidents, Hazards, SEPTA Internal Audits, and Other Sources with Extended Timelines Past Initial Due Dates**
Required Action 2	Within 60 days of issuance of this Special Directive, PennDOT must submit a prioritized CAP list and action plan for overseeing SEPTA actions to expedite the closing of open CAPs. At a minimum, the CAP action plan must include an updated CAP matrix with schedules and responsible parties and detailed explanations for any CAPs that will not be addressed within 12 months of the original due date. This prioritized CAP list and action plan must be submitted to FTA for review, approval, and implementation monitoring.
Finding 4.3	**PennDOT Has Many Open SEPTA Accident and Incident Investigation Reports Not Approved or Adopted Past Initial Due Date**
Required Action 3	Within 90 days of issuance of this Special Directive, PennDOT must develop a prioritized action plan and schedule to complete open accident investigation reports for FTA- and PennDOT-reportable events and improve the quality of these reports, including definition of causal factors. PennDOT must submit this action plan and schedule to FTA for review, approval, and implementation monitoring.

Category 5 – PennDOT Safety Oversight of SEPTA's Rail Transit System

Finding 5.1	**PennDOT Has Not Ensured SEPTA's Compliance with Public Transportation Safety Certification Training Program Requirements**
Required Action 1	Within 30 days of issuance of this report, PennDOT must provide FTA with the list of SEPTA's designated personnel enrolled in the PTSCTP (49 CFR § 672.21(a)). Thereafter, PennDOT must provide quarterly updates documenting that designated SEPTA personnel are completing the applicable training requirements within three years of their designation and, thereafter, complete refresher training every two years (49 CFR § 672.13(c)).
Finding 5.2	**PennDOT Must Expand Activities to Address SEPTA's Lagging SMS Implementation**
Required Action 2	Within 90 days of issuance of this report, PennDOT must require SEPTA to develop a detailed and expedited milestone schedule for its SMS implementation plan, including new resources to support its SMS program as specified in SD 24-2 and oversee its implementation. Within 90 days of issuance of this report, PennDOT must begin to provide monthly status reports to FTA. PennDOT must submit the SMS implementation plan with assigned resources and monthly status reports to FTA for review, approval, and implementation monitoring.
Finding 5.3	**PennDOT Has Not Expedited Action to Ensure SEPTA's Program for On-Track Safety Is Sufficient to Ensure Worker Safety**
Required Action 3	PennDOT must conduct an audit of SEPTA's on-track safety program to occur no later than 60 days after the issuance of this report. This audit must thoroughly assess SEPTA's implementation of its RWP program, with a focus on the adequacy of on-track safety standards, the effectiveness of job briefings and personal protective equipment, the comprehension of on-track responsibilities and communication by workers, and the proper execution of levels of protection, including rules for Qualified Protection Employees, Flagpersons, and Watchpersons and Advanced Watchpersons. Additionally, PennDOT must review the implementation of SEPTA's right to challenge rules and evaluate the sufficiency of staffing, including instructors and supervisors responsible for overseeing program effectiveness. PennDOT must issue findings requiring corrective action as necessary. PennDOT must submit the audit report (and corrective actions if applicable) to FTA for review, approval, and implementation monitoring.

Finding 5.4	**Expedited Safety Oversight Is Required for SEPTA's Control Center**
Required Action 4	Within 90 days of issuance of this report, PennDOT must conduct an audit of rail operations to focus on the SEPTA Control Center. The audit must examine staffing, training, hours of service and fatigue, radio discipline, rules compliance, and issue findings requiring corrective action as necessary for MFL/BSL desks as well as Light Rail/NHSL desks and management. PennDOT must submit the audit report (and corrective actions if applicable) to FTA for review, approval, and implementation monitoring.
Finding 5.5	**PennDOT Must Expand Activities to Ensure SEPTA's Emergency Communication Devices Are Operable**
Required Action 5	PennDOT must audit all emergency communication devices on SEPTA's BSL within 90 days and require and verify corrective action to repair or replace defective equipment. PennDOT must submit the audit report (and corrective actions if applicable) to FTA for review, approval, and implementation monitoring.
Finding 5.6	**PennDOT Has Not Ensured SEPTA Meets ASP and Commonwealth AED Requirements**
Required Action 6	Within 30 days of issuance of this report, PennDOT must direct SEPTA to assess the current condition of its AED inspection and service program and make any changes or require corrective actions as needed to ensure compliance with Pennsylvania statutes and SEPTA's ASP. PennDOT must submit the assessment (and corrective actions if applicable) to FTA for review, approval, and implementation monitoring.
Finding 5.7	**PennDOT Must Do More to Require SEPTA's REE&M Department to Control Safety-Critical Documents**
Required Action 7	Within 60 days of issuance of this report, PennDOT must direct SEPTA REE&M to ensure the removal of outdated manuals and procedures located in the shops and garages. PennDOT must submit evidence verifying the removal of outdated information in shops and garages to FTA for review and approval, and implementation monitoring.
Required Action 8	Within 90 days of issuance of this report, PennDOT must review REE&M's method for distributing SOPs or procedures as Notices on bulletin boards and direct SEPTA REE&M to formalize existing SOPs or procedures into a more trackable and comprehensive media available to the employees. PennDOT must submit the revised practices and supporting documentation to FTA for review, approval, and implementation monitoring.

Required Action 9	Within 150 days of issuance of this report, PennDOT must direct SEPTA REE&M to complete and issue its revision to SEPTA's document management, management of change, and configuration control procedures. PennDOT must submit both its direction to SEPTA and SEPTA's revised procedures to FTA for review, approval, and implementation monitoring.
Finding 5.8	**PennDOT Has Not Ensured that SEPTA's REE&M Department Implements a Formal Safety Rules Compliance Program**
Required Action 10	Within 150 days of issuance of this report, PennDOT must direct SEPTA REE&M to formalize its safety rules compliance program. PennDOT must submit both its direction to SEPTA and the formalized program to FTA for review, approval, and implementation monitoring.
Finding 5.9	**PennDOT Can Do More to Ensure Independence of REE&M Department's QA/QC Program for Safety-Critical Inspections and Maintenance**
Required Action 11	Within 180 days of issuance of this report, PennDOT must assess the adequacy of SEPTA REE&M's QA/QC program, to include capital programs, supply chain acquisitions, operations, and maintenance, and determine if additional efforts are warranted and require corrective actions are needed. PennDOT must submit the assessment (and corrective actions if applicable) to FTA for review, approval, and implementation monitoring.
Finding 5.10	**PennDOT Must Expand Activities to Oversee Tool Calibration**
Required Action 12	Within 180 days of issuance of this report, PennDOT must direct REE&M to formalize calibration practices for precision instrumentation/tooling. PennDOT must submit its direction to SEPTA and the formalized program to FTA for review, approval, and implementation monitoring.
Finding 11	**PennDOT Must Enhance Oversight of REE&M Department to Ensure Capability to Perform Safety-Critical Functions**
Required Action 13	Within 150 days of issuance of this report, PennDOT must review and assess REE&M staffing and determine if additional hiring efforts are warranted and require corrective action as needed. PennDOT must submit the assessment (and corrective actions if applicable) to FTA for review, approval, and implementation monitoring.
Required Action 14	Within 210 days of issuance of this report, PennDOT must review and assess the sufficiency of REE&M training and require corrective action as needed. PennDOT must submit the assessment (and corrective actions if applicable) to FTA for review, approval, and implementation monitoring.

Appendix B: SEPTA Overview

History and Organization

The Pennsylvania General Assembly established SEPTA on February 18, 1964, to provide public transit services for Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties. Over the years, SEPTA acquired the assets of several private transportation operators to form four operating divisions focused on rail transit, bus, and commuter rail service (see Figure 8 below):

- **City Transit Division** – SEPTA acquired the assets of the former Philadelphia Transportation Company in 1968, forming the current City Transit Division. The City Transit Division, which primarily serves the City of Philadelphia, operates 78 bus routes and 8 Metro Rail lines.

- **Victory Division** – The Victory Division, formerly known as the Philadelphia Suburban Transportation Company, serves Chester, Delaware, and Montgomery Counties. Also known as Red Arrow until 1970, SEPTA's Victory Division is comprised of 20 bus routes and 3 Metro Rail lines.

- **Frontier Division** – The Frontier Division consists of 25 bus routes serving Bucks, Chester, and Montgomery Counties. These routes formerly came under the auspices of several private operators, including Schuylkill Valley Lines, which was acquired in 1976.

- **Regional Rail Division** – The Regional Rail Division provided commuter rail and serves the City of Philadelphia, as well as Bucks, Chester, Delaware, and Montgomery Counties, with service to Newark, Delaware, and Trenton and West Trenton, New Jersey. The infrastructure and assets of Regional Rail were previously operated by the Pennsylvania and Reading Railroads. These Regional Rail lines were operated by Conrail from 1976 through 1982 and acquired by SEPTA in 1983 and are under FRA jurisdiction.

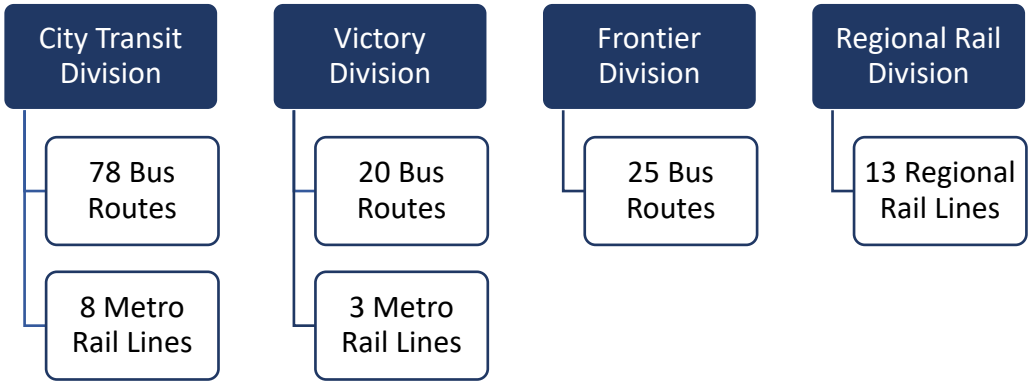

Figure 8. SEPTA Operating Divisions

SEPTA is the fifth largest public transit system in the U.S., and the largest in Pennsylvania. In Fiscal Year 2019, SEPTA provided more than 293 million passenger trips, with average weekday ridership of approximately 975,500 trips. As of December 2023, SEPTA systemwide ridership is at 68 percent of pre-COVID levels, with an average weekday daily ridership approaching 700,000.

SEPTA's governance structure is overseen by a 15-member Board of Directors, consisting of ten county and city board members, with two representatives from each of the four counties within SEPTA's jurisdiction and two from the City of Philadelphia, plus five government-appointed board members representing various political positions. The SEPTA board is further supported by five SEPTA officers, including the SEPTA General Manager/Chief Executive Officer, Treasurer, General Counsel, Controller to the Board, and Secretary to the Board. These individuals play a critical role in steering SEPTA's strategic direction and operational effectiveness. Additionally, the organization's executive leadership, led by the General Manager/Chief Executive Officer, is responsible for the day-to-day management of the system.

Rail Transit Operations

As shown in Figure 9 below, the SEPTA rail transit system[40] consists of 11 rail lines serving 134 stations with a fleet of 504 railcars. These include the Market–Frankford Line (Blue Line), the Broad Street Line (Orange Line), and the Norristown High Speed Line (Purple Line). Each has unique characteristics and serves critical transportation needs in the region. The trolley lines, categorized as light rail or streetcar, include the suburban Media–Sharon Hill Line and six Subway-Surface lines. Table 5 provides additional detail.

[40] SEPTA commuter rail routes subject to FRA rules and regulation. Further, the Red Line depicted in the map is run by PATCO and not operated by SEPTA. Neither the commuter rail nor the Red Line were included in this SMI.

Figure 9. SEPTA Rail Transit Map

Rail Transit Line Description[41]	Power	Number of Stations and Total Miles of Track	Average Weekday Trips[42]	
			2019	2022
Blue Line Heavy Rail 69th Street to Frankford	Third rail (under running)	28 Stations 26 mi	248,642	143,834
Orange Line Heavy Rail NRG to Fern Rock	Third rail (top running)	25 Stations 36 mi		
Purple Line Heavy Rail 69th Street to Norristown	Third rail (top running)	22 Stations 26.7 mi		
Green Line Streetcar Suburban trolley (Routes 101 & 102) (Media–Sharon Hill Line)	Overhead catenary system	50 Stations & stops 23.7 mi	62,512	28,685
Green Line Subway-Surface trolley (Routes 10, 11, 13, 15, 34, and 36)	Overhead catenary system	10 Stations & many stops 72.2 mi		

Table 5. SEPTA Rail Transit Line Characteristics

Rail Transit Fleet and Vehicle Maintenance

Market–Frankford Line (MFL) – Blue Line

Blue Line Vehicles
218 M-4 railcars (manufactured 1997–1999)

The Blue Line consists of 218 M4 railcars, 110 of which are married pairs, initially built between 1997 and 1999. They are being replaced by the new M5 railcars. SEPTA maintains its Blue Line vehicle fleet at the Bridge Street Carhouse and the 69th Street Shop and Car-house. Light repairs, minor inspections, and fleet housekeeping are conducted at the Bridge Street Carhouse, while repairs and heavy maintenance on rail vehicles and work car fleets are performed at the 69th Street Shop and Car-house.

[41] Information from SEPTA's 2022 Rail ASP.

[42] Service information reported to the FTA National Transit Database.

Broad Street Line (BSL) – Orange Line

SEPTA maintains its Orange Line vehicle fleet at the Fern Rock Car-house and Shop. The Orange Line fleet comprises 125 Kawasaki B-IV railcars built between 1983 and 1984.

Orange Line Vehicles

125 Kawasaki B-IV railcars (1983–1984)

Norristown High Speed Line (NHSL) – Purple Line

SEPTA maintains its Purple Line vehicle fleet at the NHSL Shop, a separate building in the larger 69th Street Complex. The Purple Line fleet consists of 26 ADtranz N-5 vehicles built in 1993. The cars use a three-phase alternating current drive controlled by GTO-Thyristors, and the cars can be run either individually or coupled together to form train sets of up to four cars.

Purple Line Vehicles

26 ADtranz N-5 railcars (1993)

Trolley Service – Green Line

SEPTA trolley service, all of which is the Green Line, is segmented into two categories: Suburban trolley and Subway-Surface. All trolleys use wide-gauge tracks at 62.25 inches. In early 2023, SEPTA signed a contract with ALSTOM for 130 new low-floor streetcars to be delivered. These cars are scheduled to be delivered from 2027 through 2030.

Green Line Vehicles

29 Kawasaki DE railcars (1982)

112 Kawasaki SE railcars (1981; mid-life overhaul 2018–2021)

18 PCC II streetcars (1947, mid-life 2004)

Media–Sharon Hill Line (MHSL) – Suburban trolley (Routes 101 and 102) – SEPTA maintains their suburban trolley vehicle fleet at the 69th Street Media–Sharon Hill Line Carhouse. The suburban trolley lines are serviced by 29 Kawasaki DE light rail vehicle rails cars built in 1982.

Subway-Surface trolley (Routes 10, 11, 13, 34, 36, and Route 15) – SEPTA maintains its subway-surface vehicle fleet at Elmwood, Woodland, and Callowhill facilities. The 112 Kawasaki SE railcar vehicles that operate on these lines, except for Route 15, have a design life of 30 years with an estimated annual average of 35,000 miles per car. Initially built in 1981, these vehicles had life-extending maintenance overhauls between 2018 and 2021. Route 15, the Heritage Streetcar, is normally serviced by 18 historic 1947 PCC vehicles. The PCC vehicles were fully rehabilitated in 2004. However, the fleet was replaced by buses on Route 15 starting in January 2020 when most of the vehicles failed inspection. SEPTA is working to return PCC vehicles to service in 2024.

Blue Line Vehicle Maintenance Activities		
Vehicle Type	**Lifecycle Management Strategy/Activity**	**Frequency**
ADtranz M-4	Safety Inspection	Daily, entire fleet visually inspected over 15 days
	A Inspections	60 days
	B Inspections	120 days
	C Inspections	360 days
	State Inspections	180 days
	Vehicle Overhaul Program	5 years

Orange Line Vehicle Maintenance Activities		
Vehicle Type	**Lifecycle Management Strategy/Activity**	**Frequency**
Kawasaki B-IV	Safety Inspection	Daily, entire fleet visually inspected over 15 days
	A Inspections	60 days
	B Inspections	120 days
	C Inspections	720 days
	State Inspections	180 days
	D Inspections/ Vehicle Overhaul Program	5 years

Purple Line Vehicle Maintenance Activities		
Vehicle Type	**Lifecycle Management Strategy/Activity**	**Frequency**
ASEA N-5	Safety Inspection	Daily, entire fleet visually inspected over 15 days
	A Inspections	60 days
	B Inspections	120 days
	C Inspections	360 days
	State Inspections	180 days
	Vehicle Overhaul Program	5 years

Green Line (Routes 10, 11, 13, 34, 36, 101, 102) Vehicle Maintenance Activities		
Vehicle Type	**Lifecycle Management Strategy/Activity**	**Frequency**
Kawasaki K LRV	Safety Inspection	Daily, entire fleet visually inspected over 10 days
	A Inspections	60 days
	B Inspections	120 days
	C Inspections	360 days
	State Inspections	180 days
	Vehicle Overhaul Program	5 years

Green Line (Routes 15) Vehicle Maintenance Activities		
Vehicle Type	**Lifecycle Management Strategy/Activity**	**Frequency**
PCC-II Fleet	Safety Inspection	Biweekly visual inspection
	A Inspections	60 days
	B Inspections	120 days
	C Inspections	360 days
	State Inspections	180 days
	Vehicle Overhaul Program	5 years

Table 6. SEPTA Rail Transit Vehicle Maintenance Activities

Fixed-Route Bus System Operations

SEPTA has 128 bus routes[43] including city routes, suburban routes, regional rail connector routes, circulator routes, shuttle services, and specialized services, as shown in Figure 10. SEPTA Bus Transit System Map. SEPTA's bus transit mode consists of approximately 1,482 revenue vehicles and provides service over approximately 3,000 miles of routes operating on public streets, highways, and thoroughfares. These numbers include SEPTA paratransit and trackless trolley modes—neither of which are covered in this SEPTA SMI.

[43] SEPTA also runs 56 school trip routes which were not included in this SMI.

SEPTA provides bus service seven days a week with hours varying by route; 27 routes provide all night, or "owl," service. Routes generally are organized as follows:

- City routes: Lettered, one- and two-digit names
- Suburban routes: 90- and 100-series names
- Regional rail connector routes: 200-series names
- Specialized or third-party contract services: 300-series names
- Limited-service school bus routes: 400-series names

SEPTA multimodal transportation centers include:

- 69th Street – Bus and MFL, MSHL, and NHSL
- Olney – Bus and BSL
- Frankford – Bus and MFL
- Norristown – Bus and NHSL
- Chester – Bus and regional rail

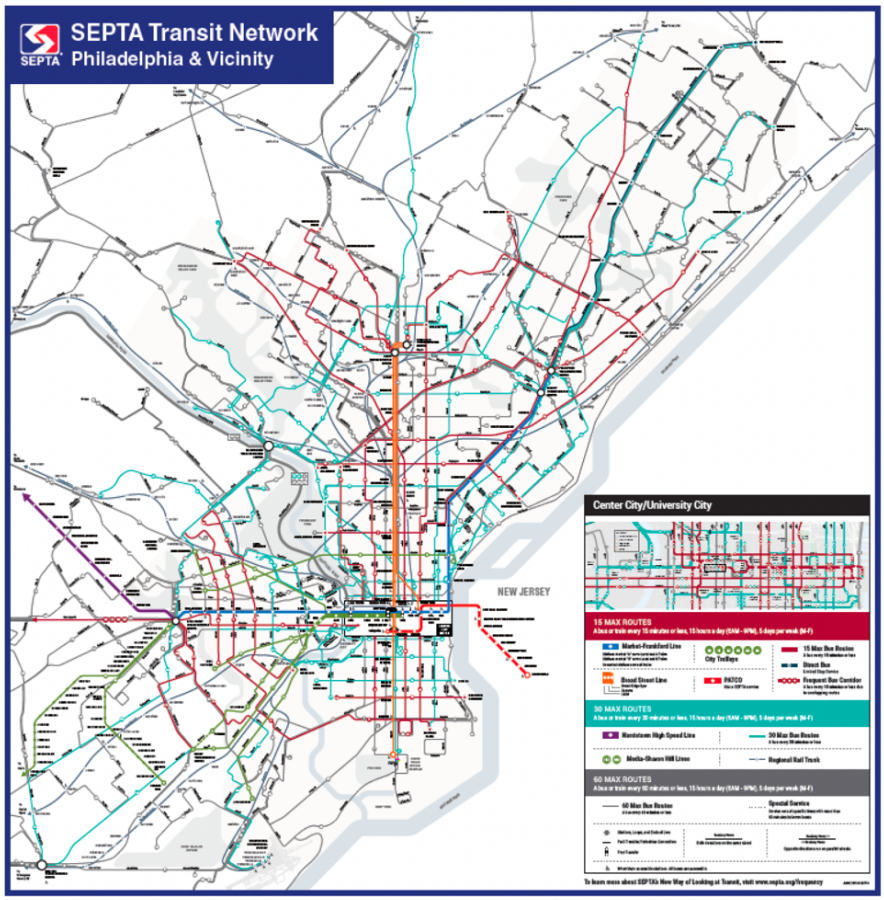

Figure 10. SEPTA Bus Transit System Map

Fixed-Route Bus Transit Fleet and Vehicle Maintenance

SEPTA's Bus Vehicle Equipment Maintenance Division is responsible for inspection and maintenance activities for the bus fleet. Bus Vehicle Engineering is responsible for vehicle procurement, vehicle overhauls, failure and trend analysis activities, quality assurance and control programs, and monitoring and managing changes to bus vehicle maintenance equipment, facilities, procedures, manuals, inspection and maintenance practices, and vehicle technologies. In general, bus vehicle maintenance adheres to the inspection, maintenance, and service schedule presented in Table 7 below.

Lifecycle Management Strategy/Activity	Frequency
Pre-Trip Inspection	Daily
"A" Minor Inspections	3,000 miles
"B" Major Inspections	12,000 miles
HVAC	12,000 miles
PA Safety	Bi-annual
Heavy Sub-system Maintenance	Cycle driven by the Vehicle Original Equipment Manufacturer subsystem supplier and SEPTA Engineering
Major Overhaul	Mid-life
Special Campaigns (vehicle modifications, retrofits, remediation of fleet defects, etc.)	As needed

Table 7. SEPTA Bus Transit Vehicle Maintenance Activities

Buses are maintained by at eight SEPTA district shops designed for inspection and maintenance activities and two heavy maintenance or back shop facilities. Periodic inspections, as well as routine maintenance and service, are performed at Allegheny, Callowhill, Comly, Frankford, Frontier, Midvale, Southern, and Victory garages. Heavy maintenance, overhaul, and major component rebuilds are completed at the Berridge Shop and the Germantown Brake Center.

Over 80 percent of the bus fleet is dated from 2008 to the present. New Flyer vehicles make up 81 percent of the fixed route fleet, along with several Nova models (17 percent) and one Proterra model (2 percent). Of the 1,145 total New Flyer vehicles, 908 are hybrid models.

Operations Control Center (Control Center)

SEPTA's Control Center plays a critical role in ensuring the efficient and safe operation of the transit system, monitoring passenger flow, responding to incidents, and providing the

necessary support during both routine bus and rail operations and exceptional circumstances. In 2019, SEPTA underwent a significant reorganization of its Control Center aimed to enhance the efficiency and effectiveness of managing the transit system and ensuring the safety and convenience of passengers. As part of the reorganization, a new leadership role was created: the Chief of Control Center for Bus, Subway, and Light Rail. This role oversees the daily operations and coordination of these key transit modes, ensuring smooth service delivery.

SEPTA maintains an Alternate Control Center, which serves as a fully redundant backup located outside the central business district of Philadelphia. This backup facility ensures continuous control and coordination of transit operations in case of emergencies or disruptions at the primary Control Center.

Control Center Organization

Broad Street Line (Subway) and the Market–Frankford Line (Subway-Elevated): Responsible for the operation and management of two major subway lines in Philadelphia: BSL and the MFL. It includes monitoring train movements, station operations, and incident response. MFL and BSL Train Dispatchers oversee the MFL and the BSL. For the MFL, the Train Dispatchers have a comprehensive view of the entire line on a model board. They also have remote control over interlockings via the computer system. On the BSL, a similar setup is in place, allowing the Train Dispatcher to monitor and control the line effectively.

Norristown High Speed Line and Media–Sharon Hill Line Routes 101 & 102: Oversees the NHSL and trolley Routes 101 & 102. It ensures the safe and efficient operation of these lines, including monitoring schedules and responding to any disruptions. NHSL Controllers for the NHSL have supervisory control and complete monitoring capability over the line. This control is facilitated by a Supervisory Control and Data Acquisition (SCADA) system equipped with computer terminals and an overview screen. Trolley Line Supervision and movement control for Route 101 & 102 Trolley Lines are primarily handled through radio communications and field personnel. Global Positioning System (GPS) technology tracks trolley locations, which can be viewed on an overview screen and computer-aided radio dispatch (CARD) workstation. The model board, in this context, provides general location information but does not offer logical control of interlockings.

City Trolley / Streetcar: The City Trolley Controller uses technology such as radio consoles and personal computers to monitor and manage trolley movements. A Communications-Based Train Control system is employed to track trolley locations and provide some control over the subway or underground portion of these lines. Additionally, GPS systems are installed on trolleys to track their positions on the streets. A CARD system, like the one used for Bus Control, is also used for Radio Dispatch and Incident Management.

Bus Operations: All bus vehicles have automatic vehicle location systems for tracking of vehicles. Bus Control is equipped with a CARD system, allowing communications with the entire fleet.

Control Center Components

- **Subway/Light Rail Power Dispatching** – The power dispatching section manages the electrical power distribution for subway and light rail systems. This includes ensuring a stable power supply for trains and related infrastructure.

- **Police Radio Room** – The Police Radio Room is a critical communication hub facilitating coordination between transit police officers and control center personnel. It plays a crucial role in responding to security incidents and emergencies in the transit system.

- **Control Center Information** – This component serves as a central repository of information and data necessary for control center operations. It includes real-time updates on transit operations, schedules, and system status.

- **Command Center** – The Command Center handles major events, both planned and unplanned. It serves as a command post where senior management staff from different areas of the organization can gather to oversee operations and make strategic decisions. It is equipped with tools such as Modal CTC model boards, video feeds, cable TV feeds, and a phone interface with county and city emergency management offices. This ensures seamless coordination and communication during significant incidents or events that may impact transit services.

- **Closed-circuit Television Cameras** – Cameras are installed at passenger stations, including those on the MFL and BSL, underground trolley stations, as well as key Center City stations such as Jefferson and Suburban. These cameras primarily serve to record video for post-facto investigation of safety, security, or operational incidents. While not designed for real-time monitoring, they can be accessed during emergencies to assess site conditions and assist in emergency response efforts and for evidentiary purposes to record and document activity for various types of investigations.

SEPTA Transit Police Department

SEPTA Transit Police have been responsible for protecting SEPTA property, staff, and the riding public since 1981. The department is led by the Chief of Transit Police and has 263 budgeted staff with a budgeted number of 195 sworn officers.

- The Patrol section is the largest and deploys officers on foot and in patrol cars to cover all SEPTA transit modes throughout three patrol districts. The three patrol districts overlap in City Center Philadelphia, where transit services are concentrated and busiest.

- The Special Operations sections include the Canine Unit, Visible Intermodal Prevention Enforcement Response Team, Special Operations Response Team, and Criminal Investigations Squad.

- The Office of Professional Responsibility consists of an Internal Affairs Unit, Training and Recruitment Unit, Communications/Technical Unit, and administrative staff.

The department manages two unarmed security contracts. One is used for opening and closing MFL stations and the other has security personnel focused on end-of-the-line operations on both the BSL and MFL. Security personnel primarily serve the role of reminding passengers of SEPTA rules, serving as a deterrence, and observing and reporting criminal or dangerous activity to SEPTA Transit Police.

Additional features, updates, and capabilities of the STPD include:

- **Body-Worn Cameras** – Small camera and audio devices worn by officers to record activities and interactions between officers and the community.

- **Transit App** – Since 2016, allows passengers and transit workers to covertly communicate a problem, crime, or other security concern directly to SEPTA police through a text, chat, or phone call.

- **Fleet Overhaul and Expansion** – SEPTA police are scheduled to receive a new fleet of patrol vehicles by the end of 2024, doubling the fleet from 15 to 30 vehicles.

- **Virtual Control Center** – Dedicated center, co-located with police dispatch, for the identification and response to threats through closed-circuit television.

- **Gun Detection Technology Pilot Program** – A technology programmed to identify firearms on the transit system and monitored by ex-military personnel who communicate valid concerns directly with SEPTA police.

SEPTA Transit Police work in coordination with local police departments and emergency responders. SEPTA Police Officers are expected to respond to a call within three minutes of receipt. If a SEPTA officer is unable to reach the scene within this time frame, then local police are dispatched until SEPTA officers arrive.

Appendix C: PennDOT Overview

History

Since 1991, the PennDOT SSO program, formerly referred to as the Rail Transit Safety Review Program, has provided safety and security oversight for rail transit agencies in the Commonwealth of Pennsylvania. The PennDOT SSO program was implemented before FTA mandated State safety oversight in 1996 through the 49 CFR Part 659 State Safety Oversight final rule. PennDOT's SSO program was established at the Governor's recommendation in the aftermath of a fatal SEPTA accident in 1990.

PennDOT's SSO Division received FTA certification in April 2018 for fulfilling the requirements for the most recent SSO program revision, captured in 49 CFR Part 674 State Safety Oversight (Part 674). PennDOT also provides security oversight for its transit agencies beyond the scope of Part 674. In addition, PennDOT is preparing to implement the new requirements outlined in the Bipartisan Infrastructure Law, issued in November 2021.

Organization and Staffing

PennDOT's SSO Division, under the Bureau of Rail, Freight, Ports, and Waterways, acts as the designated SSOA for the Commonwealth of Pennsylvania. This division is tasked with supervising fixed guideway safety throughout Pennsylvania, ensuring safe operation of the rail transit systems that serve millions of residents.

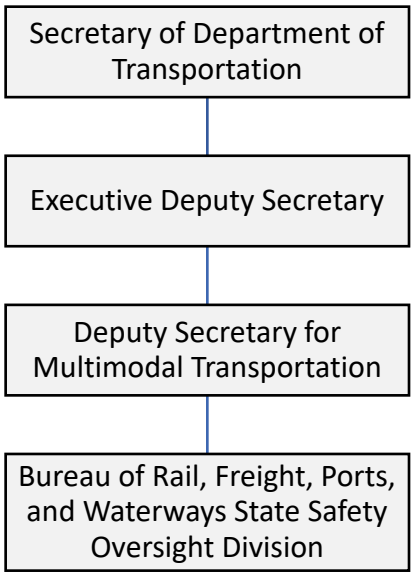

Figure 11. State Safety Oversight Organization within PennDOT's Organization

The PennDOT SSO program is financially and legally independent from the fixed guideway systems it oversees to prohibit a conflict of interest or the appearance of a conflict of interest that may undermine the oversight agency's purpose of safety oversight. To implement

oversight programs and activities, PennDOT staff is supported by contractors who abide by the conflict-of-interest requirement.

PennDOT staff and contract support are responsible for meeting the training requirements described in the 49 CFR Part 672 Public Transportation Safety Certification Training Program final rule, as well as the separate PennDOT-specific requirement that personnel obtain a Transit Safety and Security Program certification.

PennDOT Responsibilities

PennDOT is responsible for overseeing fixed guideway transit modes in the state of Pennsylvania for SEPTA, Pittsburgh Regional Transit (PRT), and Cambria County Transit Authority (CamTran) fixed guideway transit services.[44]

SEPTA

- SEPTA rail transit includes heavy rail and streetcar/trolley transit modes. The three heavy rail lines are the:
    - Market-Frankford Line (subway-elevated),
    - Broad Street Line (subway), and
    - Norristown High Speed Line (surface).
- The SEPTA streetcar lines include the following:
    - Media–Sharon Hill Line (trolley routes 101 and 102) and
    - Subway–Surface Lines (trolley routes 10, 11, 13, 15, 34, and 36).
- PennDOT's SSO program excludes SEPTA's commuter rail lines, which are operated under FRA regulations. Details on fleet and infrastructure for SEPTA rail transit are further detailed in Appendix B: SEPTA Overview.

[44] The Port Authority Transit Cooperation (PATCO) provides rail transit service from southern New Jersey into Philadelphia and falls under the State of New Jersey's Department of Transportation (NJDOT) SSO program. PATCO assets located in Philadelphia, such as stations and security functions, may be subject to PennDOT reviews. However, by agreement, NJDOT serves as the primary oversight entity for PATCO and PennDOT communicates any PATCO concerns or issues discovered through their oversight activities to NJDOT, as needed. PATCO was not included in this SMI.

PRT

- The PRT light rail, known as "The T," serves the city of Pittsburgh with 26.2 miles of route track over three lines. The light rail trains run on wide gauge track (62.5 inches) through a combination of environments, including subway, tunnels, public streets, private rights-of-way, and shared busways. The 83 light rail vehicles service 51 stations.

- PRT also operates a busway system with three private, bus-only rights-of-way that PennDOT oversees, as PennDOT considers this mode of transit a fixed guideway transit service. The East Busway is 9.1 miles long and serves 34 routes. The South Busway, which shares part of its right-of-way with light rail, is 4.3 miles long and serves 16 routes. The West Busway is 5 miles long and serves 11 routes.

- Lastly, the PRT owns and operates the Monongahela Incline (inclined plane), which dates to the 1870s. The inclined plane consists of two counterweighted cars running on cables at approximately 6 miles per hour (mph). The inclined plane connects Station Square (base) to the exit point on Mount Washington, moving approximately 370 feet of elevation and 635 feet in length.

CamTran

- CamTran transit services connect riders to locations in the city of Johnstown, Cambria County, and portions of Somerset County. CamTran operates an inclined plane, which began operations in 1891, and is currently being renovated and is out of service. The inclined plane consists of two counterweighted cars running on cables over the length of 895 feet. The system connects its base station to the upper station, transporting passengers 1,693 feet in elevation.

Program Management

The PennDOT SSOA Program Standard, dated July 2023, presents Federal requirements and State standards for managing the Pennsylvania SSO program. PennDOT reviews the document annually to incorporate changes in Federal requirements, SSO practices, and other factual corrections as needed, and then provides the Program Standard to the transit agencies for review during the annual review process. Comments and suggestions provided by the transit agencies are incorporated when appropriate. The PennDOT Program Standard incorporates SMS principles throughout and is augmented by six Standard Operating Procedures (SOPs) and one Safety Standard. These supplemental documents outline the SSOA's protocols for specific oversight and requirements of the transit agencies.

- Standard Operating Procedures 100 – 1.4: Safety and Security Audits and Reporting

- Standard Operating Procedures 100 – 2.4: Corrective Action Plans

- Standard Operating Procedures 100 – 3.5: Operations and Stations Reviews

- Standard Operating Procedures 100 – 4.1: Event Investigation
- Standard Operating Procedures 100 – 5.2: Risk-Based Assessment Outline
- Standard Operating Procedures 100 – 6.1: Speed Detection Device
- Safety Standard 100 – 1.2: Roadway Worker Protection

Oversight Activities

PennDOT has enhanced its oversight program over the past three decades to include many activities that support rail safety and security. PennDOT's fixed guideway oversight activities include:

- ASP reviews and SMS monitoring,
- safety rules, plans, and procedures compliance reviews,
- safety certification and capital project oversight,
- audits and special inspections,
- operations and station reviews and observations,
- CAP monitoring and management,
- event investigation and reporting,
- security and emergency preparedness oversight,
- safety training oversight,
- risk-based inspection program implementation and monitoring, and
- provision of an annual report on PennDOT SSO activities to the Governor, each transit agency's Accountable Executive, and each transit agency's Board of Directors.

Corrective Action Plan Management

Section 7 of the PennDOT Program Standard outlines CAP requirements and practices for fixed guideway transit agencies under the SSOA's jurisdiction. CAPs may be derived from a number of sources including those identified by the FTA and ordered by PennDOT. CAPs must be submitted to PennDOT within 30 days of identification of the need for a CAP. The SSOA reviews the CAP within 15 days of receipt and will provide written acceptance or rejection of the submission. In the case of a CAP requiring immediate action, SEPTA may implement immediate corrective actions prior to SSOA approval and must notify PennDOT within 24 hours of identification of the need for the emergency CAP.

Transit agencies must track CAPs through PennDOT's electronic database and provide updates at least monthly. Transit agencies are expected to submit documentation to support CAP closure, as scheduled. As a CAP target date nears, the transit agency must provide PennDOT with either document verification that supports CAP closure or a written extension request in the event more time is necessary to execute the CAP. To address the latter, the SSOA will reply with a written approval or rejection of the agency's extension request. Other updates to a CAP, such as modifications to CAP scope, approach, etc., must comply with the practices outlined in the Program Standard.

While a CAP is being managed and tracked, the SSOA may request evidence, documentation, or other demonstration of interim progress from the transit agency. When a transit agency considers a CAP closed, the agency must provide proper evidence, documentation, and other materials to the SSOA within seven days of its closure. Verification for official closure of a CAP is the responsibility of the SSOA. PennDOT may conduct verification through document and photo reviews, records audits, announced and unannounced inspections, field observations, and other activities, as necessary.

Enforcement Authority

As detailed in Section 2.6.1 of the PennDOT Program Standard, PennDOT has established a tiered escalation process to exercise the SSOA's enforcement authority over a fixed guideway system in the event PennDOT determines further actions need "to be taken based on the severity of a violation, deficiency, safety issue, and/or emergency." If PennDOT discovers a concern that requires further attention or action, the SSOA may enact one, or a combination of, the three tiers of enforcement authority, selecting the appropriate action based on the nature of the concern.

Escalation

- The SSOA makes a request directly to the agency's Chief Safety Officer (CSO), requiring response within a designated time frame.
- If the CSO does not respond as requested, the SSOA elevates the request to the agency's Accountable Executive (AE) for immediate response.
- If the AE does not respond as requested, the SSOA elevates the request to the agency's Board of Directors and the PennDOT Secretary of Transportation and may request an emergency meeting with the agency's Board Chair, AE, CSO, and others as deemed appropriate.

Suspension or Redirection of Funding

- The SSOA provides a formal notice to the agency requesting hazard analysis to evaluate a concern requiring response within a designated time frame.
- The SSOA reviews the agency's hazard analysis submission(s) and:

- If the SSOA concurs with the agency's submission, the SSOA sends written approval, wherein the agency is to begin addressing the concern as described by the agency. The agency will inform the SSOA in writing of the resolution of the concern, after which PennDOT may perform validation for verification purposes. If the SSOA determines the concern has not been resolved, PennDOT may require further action as necessary.

- If the SSOA rejects the agency's submission, the SSOA may require a meeting with agency executives to discuss and agree on the resolution of the concern. If the SSOA and agency executives are unable to agree on the path forward, PennDOT will issue a notice to the agency that grant funding will be suspended or redirected toward remedying the concern at hand. Further, if the agency wants to contest suspension or redirection of grant funds, the agency may request a hearing through the Administrative Docket Clerk within 30 days of receipt of the SSOA notice.

Emergency Suspension of Service

In the event an agency is unable or unwilling to respond to an unacceptable hazard, PennDOT may issue an emergency suspension of service order via the following practice:

- PennDOT Secretary of Transportation presents an official order directing the agency to suspend service, as deemed necessary, and the reason for this emergency suspension (on part or all the fixed guideway system, which may include types of vehicles, fleet, facility, mode, etc.).

- One of two scenarios may follow:

  - The agency complies and immediately suspends the service as presented in the PennDOT official order, then develops an action plan (with time frames) and begins implementing actions to address the reason for the service suspension, while communicating this action plan to the SSOA.

  - The agency will inform the SSOA of the resolution of the concern and submit support documentation, after which PennDOT may perform validation for verification purposes.

- If the SSOA validation reviews verify remediation of the concern, the SSOA will provide a written approval to the agency authorizing the agency to resume service.

- If the validation reviews do not verify remediation of the concern, the SSOA will provide a written notice communicating the remaining concerns and that the suspension of service remains in place and additional action is required.

- The agency contests the immediate suspension and requests a hearing through the Administrative Docket Clerk within 30 days of receipt of the order.