FTA

FEDERAL TRANSIT ADMINISTRATION

National Public Transportation Safety Plan

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U.S. Department of Transportation

Federal Transit Administration

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Appendices

Acronyms and Abbreviations

APTA	American Public Transportation Association
DOT	Department of Transportation
FAST	Fixing America's Surface Transportation Act
FTA	Federal Transit Administration
MAP-21	Moving Ahead for Progress in the 21st Century Act
NTD	National Transit Database
National Safety Plan, NSP, Plan	National Public Transportation Safety Plan
NPRM	Notice of Proposed Rulemaking
NTSB	National Transportation Safety Board
PTSCTP	Public Transportation Safety Certification Training Program
Section 5329	Public Transportation Safety Program, 49 U.S.C. 5329
SGR	state of good repair
SMS	Safety Management System
SSO	State Safety Oversight
SSOA	State Safety Oversight Agency
TAM	Transit asset management

EXECUTIVE SUMMARY

MAP-21 (Pub. L. 112-141 (2012))[1] amended Federal transit law by authorizing a new Public Transportation Safety Program at 49 U.S.C. § 5329. Pursuant to Section 5329(b), the Public Transportation Safety Program must include a National Public Transportation Safety Plan to improve the safety of all public transportation systems that receive Federal transit funds.

Purpose of the National Public Transportation Safety Plan

The purpose of the National Public Transportation Safety Plan or National Safety Plan, is to guide the national effort in managing the safety risks and safety hazards within our Nation's public transportation systems. The National Safety Plan must include, at minimum, the following elements:

1. Safety performance criteria for all modes of public transportation (Chapter III),
2. The definition of the term "state of good repair" (Chapter III),
3. Minimum safety performance standards for public transportation vehicles used in revenue operations that are not otherwise regulated by any other Federal agency, and that take into account relevant recommendations of the NTSB and other industry best practices and standards (Chapter IV),
4. Minimum safety standards to ensure the safe operation of public transportation systems that are not related to vehicle performance standards, (Chapter IV), and
5. A safety certification training program (See description in Executive Summary on Page 8).

FTA is committed to developing, implementing, and consistently improving strategies and processes to ensure that transit achieves the highest practicable level of safety. FTA has adopted the principles and methods of SMS as the basis for enhancing the safety of public transportation in the United States. FTA will follow the principles and methods of SMS in its development of future iterations of the National Safety Plan, rules, regulations, policies, guidance, best practices and technical assistance.

SMS helps organizations improve upon their safety performance by supporting the institutionalization of beliefs, practices, and procedures for identifying, mitigating, and

[1] MAP-21 was superseded by the FAST Act, which was signed into law on December 4, 2015. Pub. L. 114-94.

monitoring safety risks. FTA will work with the industry to phase-in the implementation of SMS. Over the next several years, FTA will continue to utilize pilot projects to build the transit industry's understanding of SMS and help FTA to both identify areas where further guidance and technical assistance are needed, and build its own core safety capabilities and processes.[2]

The direction and guidance set forth in this Plan are intended to guide FTA's partners within the transit industry towards improving an already excellent safety record. FTA believes that this Plan represents a great opportunity to make a difference in transit safety. FTA expects to see measurable improvements in safety performance across the transit industry as the Safety Program matures.

The National Safety Plan is just one component of the Public Transportation Safety Program. In addition to this Plan, FTA is undertaking the following rulemakings to improve transit safety:

- ***Public Transportation Safety Program Rule*** - On August 11, 2016, FTA issued a final rule for the Public Transportation Safety Program[3] that establishes substantive and procedural rules for FTA's administration of the Safety Program. Importantly, the rule formally establishes SMS as the foundation for FTA's development and implementation for the Safety Program. In addition, the rule institutes due process mechanisms related to FTA's exercise of its safety oversight and enforcement authorities.
- ***State Safety Oversight Rule*** - On March 16, 2016, FTA issued a final rule for State Safety Oversight to strengthen States' authority to investigate rail transit accidents and oversee the safety of rail transit systems.
- ***Public Transportation Safety Certification Training Program Rule*** - The Safety Certification Training Program establishes a curriculum and minimum competencies for Federal, SSOA personnel and contractors who conduct safety audits and examinations of rail fixed guideway public transportation systems, and for designated transit agency personnel and contractors who are directly responsible for safety oversight of a recipient's rail fixed guideway public transportation

[2] For more information on SMS, please visit FTA's SMS webpage at http://www.fta.dot.gov/tso_15176.html.

[3] Docket No. FTA-2015-0009. The Public Transportation Safety Program Final Rule is available at https://www.gpo.gov/fdsys/pkg/FR-2016-08-11/pdf/2016-18920.pdf.

systems. The final rule for the Safety Certification Training Program replaces an interim program which became effective on May 28, 2015. For more information on safety training resources, visit https://safety.fta.dot.gov/cms/welcome.

- ***Public Transportation Agency Safety Plan Rule*** - This rule would establish requirements for recipients of Federal transit funds to develop public transportation agency safety plans. The plans would include the recipient's strategies for minimizing the exposure of the public, personnel, and property to unsafe conditions and include safety performance targets.
- ***Preventing Transit Worker Assaults Rule*** - The FAST Act requires FTA to issue an NPRM to establish "rail and bus safety standards, practices, or protocols" for "protecting rail and bus operators from the risk of assault." In the proposed rulemaking, the Secretary shall consider different safety needs of drivers of different modes, differences in operating environments, the use of technology to mitigate driver assault risks, existing experience, from both agencies and operators that already are using or testing driver assault mitigation infrastructure; and the impact of the rule on future rolling stock procurements and vehicles currently in revenue service.

Each component of the National Safety Program will work together to ensure that appropriate and adequate risk surveillance, monitoring, and intervention methods and practices are utilized to minimize risks through the strategic application of available resources.

Organization of the National Safety Plan

This National Safety Plan is comprised of four chapters and two appendices.

Chapter I Introduction: Chapter I discusses the need for the Plan and the status of safety performance within the transit industry.

Chapter II SMS Framework: Chapter II provides a framework for applying SMS to a transit agency.

Chapter III Safety Performance Management: Chapter III lays out FTA's strategic approach to safety performance. This chapter sets forth FTA's safety vision and mission and establishes safety performance measures[4] for all modes of public transportation,

[4] In this Plan FTA uses the term "performance measure" as a synonym for "performance criteria" which is used in statute at 49 U.S.C. § 5329(b)(1).

which are designed to monitor improvement of safety performance in day-to-day operations. This chapter also describes how FTA will collect and disseminate safety performance data; and, based on that data, set national goals for improving the transit industry's safety performance.

Chapter IV Managing Safety Risk and Assuring Safe Performance: Chapter IV provides information about the actions FTA has taken to improve transit safety performance, voluntary minimum safety performance standards for procurement of heavy and light rail vehicles and minimum performance standards for operations, and information about other sources of technical assistance.

Appendix A and B contain a Glossary and a Sample Safety Management Policy Statement, respectively.

Chapter I - INTRODUCTION

Our national well-being is dependent upon the provision of safe, efficient, and reliable public transportation. Every day, people use buses and trains to get to and from work, school, medical appointments, and to visit friends and family. Transit systems are a part of the fabric of our nation—weaving our urban and rural environments together and encouraging economic development.

In calendar year 2014, public transit systems across the nation provided 10.7 billion trips—the highest annual ridership number in 58 years—with the number of trips exceeding 10 billion for the seventh year in a row. There is reason to believe that this is just the beginning of a sustained period of growing demand for public transportation as the population of elderly individuals who will become reliant on public transportation increases and as more young people move to urban areas to have greater access to transit options. To keep pace with growing demand, transit operators will need to balance competing priorities to expand service, while continuing to operate existing service, replace and maintain existing capital assets, and ensure that operations are safe for their employees and the riding public.

Although transit is a relatively safe mode of travel, the statistical reality is that as transit ridership increases, data indicates that the total number of fatalities and serious accidents likely will also increase. For example, although transportation-related fatalities declined in the years 2002–2012 by approximately 25 percent, according to the U.S. Department of Transportation's Bureau of Transportation Statistics' (BTS) injury rates for transit modes have been trending upward since 2002.[5]

Now is the time to implement a new framework to support and complement the existing approach to public transportation safety, and to identify deficiencies and promote improvements in transit safety performance. The National Safety Plan will serve as FTA's key communication tool for this new safety approach.

This Plan sets forth a proactive approach to safety risk management that is outcome-focused and emphasizes safety performance. Traditionally, the transit industry has

[5] http://www.rita.dot.gov/bts/data_and_statistics/index.html.

made safety improvements reactively: a crash occurs, a cause is determined, and action is taken to mitigate those causes. SMS will focus on the use of data to anticipate future risks and detect problems before crashes occur. In other words, move to a more proactive risk management approach. SMS will support FTA and transit providers of varying sizes and operating environments in the development of a data-based framework for identifying and analyzing safety hazards and risks, and prioritizing resources toward the mitigation of those safety hazards and risks.

From Compliance Approach		To SMS Approach
Documentation of current procedures and practices		Documentation of strategies to address priority safety risks
Safety regulators as primary users of safety data		Safety regulators, agency leadership, employees, and stakeholders as primary users of safety data
Focus on compliance with prescriptive regulations		Focus on measurement of effectiveness of risk control strategies and achieving safety outcomes
Reactive post-facto response to lagging indicators such as accidents		Proactive focus on accident precursors such as close calls to prevent events

Improving safety performance within the public transportation industry is a collaborative effort that requires participation from a number of partners at every level of the transit industry, including the Federal government, States, regional entities, local governmental authorities, tribal governments, and transit providers of all sizes in both cities and rural areas. Guided by FTA's safety mission and vision, the National Safety Plan will guide the collective effort to manage safety risks within our Nation's public transportation systems.

FTA and the industry's success will be based on delivering positive, measurable results, and ensuring the best use of available resources to identify safety hazards, analyze safety risks, and mitigate the potential of accidents occurring. This requires collection

and sharing of safety data to build situational awareness and enable effective risk-informed decision making. In addition, safety risk management depends on noticing risk precursors such as training compliance or preventive maintenance compliance – not just objective information about risk probability and severity, but what these precursors tell us about safety and reliability, and the public interest that drives many decisions.

FTA has a responsibility to help the industry transition into the new regulatory environment under the Public Transportation Safety Program. The National Safety Plan will be FTA's primary tool for disseminating guidance, technical assistance, templates and other information to educate, inform and assist transit providers to improve their safety performance. This Plan is not a regulation. Although transit providers are required by law to set safety performance targets based on the measures in this Plan, FTA is not currently proposing to impose mandatory requirements on the transit industry through this Plan, but may do so in the future. Accordingly, FTA will publish future iterations of the Plan in the *Federal Register* for public notice and comment.

Chapter II – SMS FRAMEWORK

Explanation of the SMS Framework

SMS is a key aspect of the FTA's new National Public Transportation Safety Program. FTA believes that effective SMS implementation will improve public transportation safety and provide transit agencies with a structure for understanding and addressing safety risks through proactive and timely data-driven organizational decision-making.

FTA developed this SMS Framework to guide public transportation and oversight agencies by:

- Providing a brief overview of key SMS concepts;
- Describing attributes of an effective SMS; and
- Presenting FTA's adopted SMS components and sub-components.

FTA's SMS Framework provides the building blocks of SMS and some of the major milestones for its implementation. By sharing this Framework, FTA aims to standardize the understanding of SMS and actively support its implementation through communication and partnership with the public transportation industry.

Why SMS?

The safety of passengers and employees is a top priority for all public transportation industry stakeholders. When compared to other modes of surface transportation, public transit has demonstrated a strong safety record. However, accidents still occur, and injury rates are trending upwards. In recent years, the understanding of how accidents happen in the public transportation industry has expanded. Looking beyond the assignment of blame to an individual employee or supervisor, SMS allows public transportation agencies to examine how organizational factors contribute to incidents, accidents, and near misses. Organizational factors include how an agency:

- Allocates its resources;
- Defines and establishes operational procedures;
- Supervises frontline personnel;
- Selects and trains staff;

- Monitors service delivery operations; and
- Resolves human performance issues.

Recent investigations of accidents and incidents have revealed the importance of these organizational factors *after the fact*. SMS proactively identifies and analyzes contributing organizational factors *before the fact*—before accidents or incidents bring them to light.

Successful management of these organizational factors requires that transit agencies make wise decisions about how they identify, prioritize, and address safety concerns. To date, most public transportation agencies have experience in applying system safety principles to address safety concerns. SMS builds on this experience by integrating basic system safety principles – updated to reflect advances in safety thinking – into specific organizational and management processes through:

- Increasing the focus on hazard identification across the organization;
- Broadening the scope of safety data collection;
- Emphasizing the importance of managing safety risks across all areas of operations;
- Integrating data from other organizational processes into safety data analysis;
- Promoting participation and contribution of frontline personnel in the management of safety; and
- Fostering an organizational culture that encourages proactive safety reporting and safety risk management.

SMS is a management system, akin to a financial or quality management system. It ensures that a public transportation agency, regardless of its size or service environment, has the necessary organizational structures, activities and tools in place, and the necessary safety accountabilities to direct and control resources to manage safety proactively and optimally.

SMS activities proactively detect safety concerns and organizational factors, and correct them using data-driven prioritization. As such, important to its success are the:

1. Effective collection, analysis, and sharing of safety data, and
2. Active, accurate, and routine safety performance measurement.

SMS provides transit and oversight agencies with additional tools and activities, and therefore new opportunities to efficiently and effectively align safety priorities and promote continuous improvement in safety performance.

Attributes of SMS

SMS is a formal, top-down, data-driven, organization-wide approach to managing safety risks and assuring the effectiveness of safety risk mitigations. SMS helps a transit agency focus its safety management efforts by ensuring that:

1. Senior management has access to the information necessary to strategically allocate resources based on the unique safety priorities of the specific transit agency;
2. Lines of safety decision-making accountability are established throughout the organization to support the resolution of safety concerns and thus promote a proactive safety culture; and
3. Transit agencies address organizational factors that may lead to safety breakdowns, identify system-wide trends in safety, and manage hazards before they result in accidents or incidents.

SMS can be adapted to the mode, size, and complexity of any transit agency in any environment: urban, suburban, or rural. The extent to which SMS processes, activities, and tools are implemented (and documented) will vary from agency to agency. For a small transit operation, SMS processes will likely be straightforward, and activities and tools less burdensome. For a larger transit agency with hundreds or thousands of employees and multiple modes, SMS processes will likely be complex, and activities and tools more resource-intensive.

SMS is adaptable

- SMS adapts to transit agencies of all sizes, service environments, modes, and operating characteristics.
- SMS provides the necessary processes, activities, and tools to manage safety effectively.

The FTA SMS Framework helps to standardize the building blocks of an effective SMS; however, each transit agency will determine the level of detail necessary to identify and

establish its accountabilities, as well as the complexity and detail of its own processes, activities, and tools to address its unique safety risks.

EXECUTIVE MANAGEMENT COMMITMENT

It is a basic management tenet that accountabilities flow top-down. Therefore, as a management system, SMS requires that safety accountability reside with the top executive of a transit agency. While this is usually at the CEO or General Manager level, an agency's Board of Directors also plays an integral role for establishing a sound foundation for safety management.

Regardless of agency size, executive management must play a significant role in developing and sustaining an SMS and a positive safety culture. Without the ongoing commitment of agency executives, any attempt for successful integration of SMS practices into the agency's activities will likely fall short. As such, before going into detail on each of the four components of the FTA SMS Framework, it is important to discuss the role of executive management in SMS implementation and continued operation.

SMS requires management commitment

- The Accountable Executive is ultimately responsible for safety management.
- Executive management includes the management of safety through SMS among its top priorities.
- Support for safety and the SMS is visible throughout all levels of management.

Executive management is ultimately accountable for safety because they are tasked with allocating resources to address business functions, including the management of safety as organizational processes.

SMS requires the establishment of explicit lines of decision-making accountability at the senior management levels. Within SMS, the individual with ultimate accountability for its day-to-day operation is known as the *Accountable Executive*. Typically, the Accountable Executive is the head of a transit agency: its CEO, President, General Manager, or Executive Director. Regardless of title, the Accountable Executive plays a central role in the development, implementation, and operation of SMS, in addition to setting safety objectives and safety performance targets.

The Accountable Executive does not need to hold special qualifications or be a safety expert. However, the Accountable Executive must:

- Understand how SMS works, what it seeks to achieve, the potential benefits it will generate for the agency, and his or her role in the management system operation;
- Know the key personnel to consult for the safety information that will inform decisions related to the allocation of resources; and
- Have an understanding of significant safety issues that a transit agency might face during delivery of services.

For an Accountable Executive, safety information–like financial, schedule, planning, and service information – is an integral source of the overall information necessary to allocate resources, set budgets, and manage safety risks. The Accountable Executive should use safety reports and analyses, which are products of SMS processes, as factors in budget planning.

The Board of Directors, or equivalent authority, plays a similar critical role in budget planning and will need to stay informed of top agency safety management priorities and, in consultation with the Accountable Executive, ensure that safety risks are minimized through the strategic application of available resources.

SMS COMPONENTS AND SUBCOMPONENTS

The FTA SMS Framework is comprised of four components and eleven sub-components.

SAFETY MANAGEMENT SYSTEM COMPONENTS

Safety Management Policy	Safety Assurance
1. Safety Management Policy Statement 2. Safety Accountabilities and Responsibilities 3. Integration with Public Safety and Emergency Management 4. SMS Documentation and Records	8. Safety Performance Monitoring and Measurement 9. Management of Change 10. Continuous Improvement
Safety Risk Management	**Safety Promotion**
5. Safety Hazard Identification 6. Safety Risk Assessment 7. Safety Risk Mitigation	11. Safety Communication 12. Competencies and Training

Each component and its sub-components are applicable to an agency of any size. SMS provides the flexibility for each transit agency to decide how to implement these processes and activities. SMS components interact with each other to provide an effective system of feedback. The following sections describe the components of SMS and serves as guidance to the transit agencies in their implementation of SMS.

I. – Safety Management Policy

The Safety Management Policy is the written foundation of a public transportation agency's safety management system. It formally and explicitly commits an agency to the development and implementation of the organizational structures and resources necessary to sustain the safety management processes and activities of an SMS. An effective Safety Management Policy establishes that a transit agency's top executive is ultimately accountable for safety management.

The Safety Management Policy component encompasses an agency's safety objectives and safety performance targets, and the necessary organizational structures to accomplish them. It establishes senior leadership and employee accountabilities and responsibilities for safety management throughout an agency. It also

SMS is formal and structured

SMS defines management commitment to meet established safety objectives and safety performance targets

commits senior leadership to the oversight of an agency's safety performance through meetings and regular reviews of activity outputs and discussions of resource allocation with key agency stakeholders.

The Safety Management Policy is implemented in practice though the Safety Management Policy Statement, which the Accountable Executive formally endorses.

SAFETY MANAGEMENT POLICY SUB-COMPONENTS

1. *Safety Management Policy Statement* – This sub-component clearly frames the fundamentals upon which a transit agency will build and operate its SMS. It documents executive management's commitment to the SMS, and places the management of safety at the same level as a transit agency's topmost business processes. Appendix B provides an example of a Safety Management Policy Statement.

   To be effective, a transit agency's Safety Management Policy Statement addresses the following six crucial aspects:

   - Must be signed by the highest executive in the agency (typically, the Accountable Executive (CEO/GM) or Board of Directors/oversight entity) to convey that SMS is important to the highest level of the organization;
   - Includes a clear statement about providing resources for managing safety during service delivery because no activities, safety-oriented or otherwise, can operate without resources;
   - Commits the agency to an employee safety reporting program to convey that receiving safety information from employees is critical to the operation and success of the SMS;
   - Defines conditions under which exemptions from disciplinary actions would be applicable, thus encouraging the reporting of safety concerns by employees;
   - Spells out unacceptable operational behaviors; and
   - Is communicated, with visible and explicit support from executive management, throughout the transit agency.

Finally, the Safety Management Policy Statement documents management's commitment to continuous safety improvement, as well as to the continuous improvement of the safety management system itself.

2. *Safety Accountabilities and Responsibilities* – This sub-component defines the accountabilities and responsibilities for the performance of the SMS. It describes the relationships between the Accountable Executive and a transit agency's governance structure.

   Under the Safety Accountabilities and Responsibilities sub-component, an Accountable Executive is identified and accountabilities, responsibilities, and authorities are defined for other executive and senior managers. These accountabilities, responsibilities (and their delegation), and authorities ensure the effective and efficient operation of the SMS, and may vary from agency to agency based on the size and complexity of the agency.

   It is critical to appoint a subject matter expert for the implementation and day-to-day operation of the SMS, as well as staff necessary to support the subject matter expert in the day-to-day operation of the SMS. The following sample responsibilities would most likely fall to this SMS manager:

   - Directs collection and analysis of safety information;
   - Manages hazard identification and safety risk evaluation activities;
   - Monitors safety risk mitigations;
   - Provides periodic reports on safety performance;
   - Advises senior management on safety matters;
   - Maintains safety management documentation; and
   - Plans and organizes safety training.

   While SMS responsibilities will not look the same at all transit agencies, the following are some anticipated, and minimum, sample responsibilities that fall on all line and technical management personnel who have responsibilities under SMS:

   - Actively support and promote the SMS;

- Ensure that they and their staff comply with the SMS processes and procedures;
- Assist in ensuring that resources are available to achieve the outcomes of the SMS; and
- Continually monitor their area of SMS responsibility.

Each transit agency will determine the structure for accountabilities and responsibilities that will best support its SMS. However, the following principles apply to all:

- Ensure accountability for SMS performance is at the highest level of the organization;
- Implement SMS in a manner that meets transit agency safety performance objectives;
- Establish the meeting or committee structure necessary for the size of the agency to ensure that safety information moves up, down and across the agency;
- Effectively communicate SMS roles and responsibilities to all relevant individuals; and
- Ensure SMS policies and procedures have been communicated to all agency employees.

3. *Integration with Public Safety and Emergency Management* – This sub-component ensures integration of programs that have input into, or output from, the SMS. Each transit agency will identify and describe the necessary coordination with both external organizations and internal departments for dealing with emergencies and abnormal operations, as well as the return to normal operations. This sub-component addresses the various internal and external programs that may affect safety management and includes an index of the plans and procedures that support the transit agency's public safety and emergency management activities. Pursuant to the Public Transportation Agency Safety Plan Rule, rail transit agencies are required to have emergency preparedness and response plans.

4. *SMS Documentation and Records* – This sub-component includes the activities for the documentation of SMS implementation, the tools required for day-to-day SMS operation, and the management of new or revised safety requirements, regulatory or otherwise.

   The extent and complexity of the SMS documentation will be commensurate to an agency's size and structure. SMS documentation and records must be readily available to those with accountabilities for SMS performance or responsibilities for SMS implementation and operation.

II – Safety Risk Management

The Safety Risk Management component is comprised of the processes, activities, and tools a transit agency needs to identify and analyze hazards and assess safety risks in operations and supporting activities. It allows a transit agency to carefully examine what could cause harm, and determine whether the agency has taken sufficient precautions to minimize the harm, or if further mitigations are necessary.

SMS is proactive

- Safety Risk Management promotes the identification of hazards before they escalate into accidents or incidents.
- Safety Risk Management assesses safety risk and establishes necessary mitigations.

All transit agencies have implemented activities to identify safety concerns. Under an SMS, this practice will expand to ensure use of both proactive (i.e. employee safety reporting) and reactive (i.e. investigations) sources that are as comprehensive as necessary for the size and complexity of the agency.

Through ongoing Safety Risk Management activities, safety hazards and concerns in transit operations are identified and assessed, and mitigations are put in place to manage their safety risk.

SAFETY RISK MANAGEMENT SUB-COMPONENTS

5. *Safety Hazard Identification* – As the first step in the Safety Risk Management process, safety hazard identification involves establishing methods or processes to identify hazards and consequences of the hazards to address them before they escalate into incidents or accidents. It also provides a foundation for the safety risk assessment and mitigation that follows.

   Hazards are an inevitable part of transit operations. Only after a transit agency identifies hazards can it address them. Many transit agencies have some of the following hazard identification sources in place:

   - Employee safety reporting program
   - Observations of operations
   - Inspections
   - Internal safety investigations
   - Accident reports
   - Compliance programs
   - Committee reviews
   - Industry data
   - Governmental sources (FTA, NTSB, oversight agency)
   - Customer and public feedback or complaints

   There are many sources for safety information and many ways to identify hazards, and the sources and methods used depend on the size and complexity of the organization. The data sources may vary, but there are key attributes of effective hazard identification:

   - The more comprehensive the data sources and documentation, the more confident management can be that safety concerns are being identified;
   - Training employees on proper identification and reporting of safety concerns increases the likelihood that hazards can be addressed;
   - Focus on the collection of safety concerns while safety representatives work with operations and management personnel to identify the exact hazard(s); and

- Promote and support agency-wide safety concern reporting and hazard identification.

Each transit agency will establish its preferred methods for identifying safety hazards. As appropriate, subject matter experts from relevant departments should be involved in a transit agency's hazard identification.

6. *Safety Risk Assessment* – Following safety hazard identification, a transit agency establishes methods or processes to assess the safety risks associated with identified hazards.

   The term "safety risk" represents the likelihood that people could be harmed, or equipment could be damaged, by the potential consequences of a hazard and the extent of the harm or damage. Therefore, safety risk is expressed and measured by the predicted probability and severity of a hazard's potential consequences.

   Safety risk assessment must consider existing mitigations when determining whether further measures are needed to reduce the likelihood and severity of the potential consequences of a hazard.

7. *Safety Risk Mitigation* – Following the safety risk assessment, a transit agency identifies any mitigations or strategies that may be necessary to protect the public and personnel from unsafe conditions.

   Safety risk mitigations are actions taken to reduce the likelihood and/or severity of the potential consequences of a hazard. Safety risk mitigation enables a transit agency to actively "manage" safety risk in a manner that is aligned with its safety performance targets, and consists of initial, ongoing, and revised mitigations.

III – Safety Assurance

Safety Assurance builds confidence and assures mitigation effectiveness

- Safety Assurance ensures that transit agencies implement appropriate and effective mitigations.
- Safety Assurance is a never-ending process that monitors the safety performance of an organization.

The Safety Assurance component ensures that mitigations are implemented, adhered to, appropriate, effective, and sufficient in addressing the potential consequences of identified hazards. Mitigations developed under the Safety Risk Management process are "handed-off" to Safety Assurance analysts reviewing the data to determine if (1) the mitigations are effective, and (2) that no new risks have been introduced through implementation of the mitigations. Safety Assurance also ensures that the SMS is effective in meeting an agency's safety objectives and safety performance targets. A transit agency assures its safety objectives are met through the collection and analysis of safety data, including the tracking of safety risk mitigations.

A transit agency implements its Safety Assurance process through the active monitoring of operations, safety reporting systems, routine workplace observations, inspections, audits, and other activities, designed to support safety oversight and performance monitoring. An effective employee safety reporting program is essential to the Safety Assurance function.

Safety Assurance also helps a transit agency evaluate whether an anticipated change may affect the safety of operations. If an anticipated change is determined to introduce safety risk, a transit agency would conduct Safety Risk Management activities to minimize the safety risk associated with the change.

SAFETY ASSURANCE SUB-COMPONENTS

8. *Safety Performance Monitoring and Measurement* – SMS generates data and information that senior management needs in order to evaluate whether implemented safety risk mitigations are appropriate and effective and how well an agency's safety performance is in line with established safety objectives and safety performance targets. Safety performance monitoring does not focus on monitoring individuals, but rather monitoring the safety performance of a

transit agency itself through routine monitoring of operations and maintenance activities. Safety performance monitoring informs the annual reviews of overall safety performance, and the SMS itself, as described below in the Continuous Improvement sub-component.

Examples of safety performance monitoring activities include the following:

- Monitor employee safety reporting program
- Monitor service delivery activities (must include field observations)
- Monitor operational and maintenance data
- Conduct safety surveys
- Conduct safety audits, studies, reviews, and inspections
- Conduct safety investigations
- Evaluate data and information from external agencies or peers

9. *Management of Change* – Change may introduce new hazards and safety risk into transit operations. Therefore, agencies should establish the criteria that define when a change must be evaluated through the Safety Risk Management process. If a proposed or identified change meets or triggers those criteria, the agency uses Safety Risk Management to review existing mitigations to determine if they are sufficient or if new mitigations are necessary. It is important that a transit agency leverage its field monitoring activities (under the Safety Performance Monitoring and Measurement sub-component) to support the identification of changes in a system that may not be planned.

10. *Continuous Improvement* – Evaluation of the SMS is necessary to ensure that it effectively and efficiently allows the agency to meet safety objectives and performance targets. Transit agencies should leverage the data and information gathered while conducting safety performance monitoring to address any identified weaknesses in SMS organizational structures, processes, and resources in a timely manner, and also complete annual reviews of overall safety performance.

IV – Safety Promotion

Safety Promotion provides visibility of executive management's commitment to safety, and fosters improved safety performance by increasing safety awareness through communication and training. Through communication of lessons learned and broader safety information, employees are made aware of safety priorities and safety concerns at both the organizational level and as they relate to their own duties and responsibilities.

The appropriate training for all staff, regardless of their level in the agency, provides visibility for, and knowledge of, the SMS. It ensures employees receive the training they need to do their job safely, and gives them shared ownership of the transit agency's safety mission. This training commitment demonstrates management's commitment to establishing an effective SMS.

SAFETY PROMOTION SUB-COMPONENTS

11. *Safety Communication* – A two-way feedback loop between frontline employees and management about safety information is crucial in establishing a positive safety culture. Effective safety communication makes personnel aware of safety priorities and initiatives and ensures that feedback is captured and acted upon as appropriate. Safety-related information must be actively and routinely communicated, and must focus on raising awareness of hazards and potential safety risks. Regular discussion of safety concerns promotes an environment that encourages employees to report concerns and demonstrates management commitment to both the employees and the agency's safety performance objectives.

12. *Competencies and Training* – Training of all employees with respect to their role and responsibilities as they relate to agency safety performance is perhaps the most critical driver for successful SMS implementation. It also shapes employee perception of executive management's commitment to safety. Achieving appropriate levels of competency for each staff level enables the consistent application of their skills to help the transit agency achieve its safety performance objectives.

At the frontline employee level, safety management training should provide for the development of *safety reporting competencies*, i.e. employees should receive formal training on the expected contents of employee safety reporting (what to report; what not to report) and the procedures established for reporting.

SMS promotes a strong culture of safety

- Safety Promotion encourages and teaches safety through effective communication and training.
- Safety Promotion ensures employees at all levels get the training they need to do their job safely.

At the safety management level, formal training should develop safety data management competencies, i.e. how to analyze safety *data*, extract *information* from the safety data, and turn safety information into safety *intelligence* for senior management decision-making for the allocation of safety management resources.

Chapter III – SAFETY PERFORMANCE MANAGEMENT

What is Performance Management?

MAP-21 transformed the Federal transit program by establishing new requirements for performance management for safety and transit asset management. Through the establishment of goals, measures, targets and plans, performance management refocuses attention on accountability and transparency and improves project decision-making through performance-based planning and programming. The performance management requirements are intended to facilitate more effective investment of Federal transportation funds by refocusing attention on national, regional, and local transportation goals, increasing the accountability and transparency of the Federal transit and Federal-aid highway programs, and improving project decision-making through performance-based planning and programming.

FTA has undertaken a number of separate but related rulemakings to implement the performance management framework and establish national performance measures. FTA must establish performance measures for transit asset management and safety, respectively. On July 26, 2016, FTA published a final rule for Transit Asset Management (TAM) NPRM which includes performance measures to improve the condition of public transportation capital assets.[6] Through this National Safety Plan, FTA is establishing safety performance measures for all modes of public transportation. Transit operators that are subject to the requirements for Public Transportation Agency Safety Plans would set targets in their Safety Plans based on the measures established in this Plan.

Safety performance management is a critical tool that will support transit providers and FTA in identifying safety concerns and monitoring progress in safety improvements. FTA's safety mission, vision and focus areas provide strategic direction for improving safety performance within the transit industry. Based on the vision, mission, and focus areas, FTA will establish performance measures to monitor industry progress towards improving safety performance and help build a common understanding of the state of safety performance.

[6] 80 FR 58912.

VISION	MISSION
To be recognized as the industry leader in safety promotion, information sharing, and fair oversight.	*To make transit safer through policy development, hazard investigation, data collection, risk analysis, effective oversight programs, and information sharing.*

Safety Focus Areas

FOCUS AREA: IMPROVE PUBLIC TRANSPORTATION SAFETY PERFORMANCE

Public transportation is an integral part of local and regional communities, providing access to work, entertainment, and critical resources. The increase in demand for public transportation, combined with lack of funding for maintenance and replacement of assets, has placed an increased burden on transit providers who must balance safety, operational, state of good repair, and expansion demands. Managing safety performance will help public transportation agencies make critical decisions about investments in safety, reconstruction, or rehabilitation of existing assets in order to achieve and maintain a state of good repair.

FOCUS AREA: IMPROVE SAFETY FOR TRANSIT ACCESS AND TRANSIT FACILITIES

Transit customers often access transit systems by walking or biking. The safety of pedestrians and bicyclists is an important consideration as public transportation providers plan projects and operate service in their communities. Transit-accessible communities promote a general sense of wellness and vitality, extending the walkability of neighborhoods and improving quality of life. It is these attributes that, in part, have created an increased demand for public transportation across the country. FTA encourages public transportation agencies to incorporate into their local safety plans performance measures that foster safe access to and safe operation of their systems. Through coordination at the local and regional level, public transportation agencies can ensure that their transit systems are both safe and accessible.

The Importance of Safety Performance Measures

Safety performance measurement will help transit agencies monitor their safety performance. The measurement and evaluation of safety performance requires a carefully structured program of planning, setting targets, identifying valid measures, conducting proper data analysis, and implementing appropriate follow-up activities. Safety performance measurement is a key aspect of a safety management process, and provides the basis for continuous safety improvement.

In order to capture the broad and varied nature of public transportation, in this first National Safety Plan, FTA is relying on measures that can be applied to all modes of public transportation and are based on data that is generally currently collected in the National Transit Database (NTD).[7] FTA's safety performance measures focus on improving transit safety performance through the reduction of safety events, fatalities and injuries. In the future, FTA intends to identify and incorporate proactive measures in future Plans. For example, FTA provides SMS training across the industry and collects information on participation in the training. In the future, FTA will be able to provide a safety performance measure related to SMS training participation from which individual transit agencies will be able to establish their own safety performance indicators and targets. Likewise, FTA will be able to establish a safety performance target for the entire industry or modes.

Pursuant to 49 U.S.C. § 5329(d), a Public Transportation Agency Safety Plan must include safety performance targets based on the safety performance measures in this Plan. The safety performance measures (fatalities, injuries, safety events and system reliability) selected by FTA are intended to provide "state of the industry" high-level measures and help focus individual agencies on the development of specific performance indicators and measurable targets relevant to their operations. These measures should also inform agencies as they identify actions they each would take to improve their own safety outcomes. Agencies should select performance targets that are appropriate to their operations and environment. Successful performance targets are specific, measurable, attainable, relevant, and time-bound (SMART). As part of the

[7] FTA recognizes that each transit agency has its own operating policies that impact how performance is reported to the NTD. However, bringing greater attention to safety and reliability metrics will encourage more robust, consistent data reporting in the future.

annual review of a Public Transportation Agency Safety Plan, each transit agency should reevaluate its safety performance measures and determine how the measures should be refined, sub-measures developed, and performance targets selected.

What are the Safety Performance Measures?

SAFETY PERFORMANCE MEASURE: **FATALITIES** (total number of reportable fatalities and rate per total vehicle revenue miles by mode)

Reducing the number of fatalities is a top priority for the entire Department of Transportation. As an industry, we must try to understand the factors involved in each fatality in order to prevent further occurrences. Measuring the number of fatalities over vehicle revenue miles, by mode, provides a fatality rate from which to assess future performance.

SAFETY PERFORMANCE MEASURE: **INJURIES** (total number of reportable[8] injuries and rate per total vehicle revenue miles by mode)

Many transit agencies have never had a fatality, and continued safe operation is exactly what is desired. However, injuries occur much more frequently, and are due to a wide variety of circumstances. Analyzing the factors that relate to injuries is a significant step in developing actions to prevent them. Again, measuring the number of injuries by mode, over vehicle revenue miles provides an injury rate from which to assess future performance.

SAFETY PERFORMANCE MEASURE: **SAFETY EVENTS** (total number of reportable events and rate per total vehicle revenue miles by mode)

The safety events measure captures all reported safety events that occur during transit operations and the performance of regular supervisory or maintenance activities. A reduction in safety events will support efforts to reduce fatalities and injuries, as well as damages to transit assets. Measuring the number of safety events by mode over vehicle

[8] The thresholds for "reportable" fatalities, injuries, and events are defined in the NTD Safety and Security Reporting Manual.

revenue miles provides a safety event rate from which future performance can be compared.

SAFETY PERFORMANCE MEASURE: **SYSTEM RELIABILITY** (mean distance between major mechanical failures by mode)

The system reliability measure expresses the relationship between safety and asset condition. The rate of vehicle failures in service, defined as mean distance between major mechanical failures, is measured as revenue miles operated divided by the number of major mechanical failures.[9] This is a measure of how well a fleet of transit vehicles is maintained and operated. FTA recognizes the diversity of the transit industry, and that agencies have varied equipment types, with varied rates of performance, so this measure allows agencies to develop safety performance targets that are specific to their own fleet type, age, operating characteristics, and mode of operation.

How are Safety Performance Measures Used to Improve Safety Performance?

The public transportation industry already has parameters for measuring some aspects of safety performance which are reported to the NTD (see Table 3-1). However, these measures need clear definitions to ensure consistency in data reporting, and better baselines against which to make future comparisons. To address these inconsistencies, FTA will develop performance measures for future editions of the National Safety Plan that address industry-wide concerns as well as those that are mode-specific. Transit agencies would have the opportunity to select those that address their particular objectives for safety improvement.

Table 3-1 Data and Information from Safety and Risk Monitoring in the Transit Industry[10]

[9] Major Mechanical System Failures: Major mechanical system failures prevent a vehicle from completing or starting a scheduled revenue trip because actual movement is limited or because of safety concerns. Examples of major bus failures include breakdowns of brakes, doors, engine cooling systems, steering, axles, and suspension.

[10] Table 3-1 illustrates the types of information that is currently collected by the transit industry to measure its safety performance.

Existing safety performance measures (under NTD)

- **Casualties**
  - Fatalities (customers, employees, and the public)
  - Injuries (customers, employees, and the public)
- **Property damage**
- **Reportable events (Accidents)**
  - Train derailments (mainline, yard, side tracks)
  - Collisions (vehicle-to-vehicle, vehicle-to-person, vehicle-to-object)
  - Collisions at grade-crossings
  - Fires
  - Evacuations for life safety reasons

Results from reportable event (accident) investigations

- Probable cause
- Contributing factors
- Corrective actions

Audit results

- Findings
- Corrective actions

Safety risk management and monitoring information

- Safety reporting from all levels of the organization
- Violations of operations and maintenance rules
- Job-based certification and awareness training
- All-hazards preparedness analyses
- Operations and maintenance performance, including state of good repair (SGR) and TAM
- Monitoring of hazard logs
- Crime trends, such as trespassing, perimeter breaches, and fare evasion
- Fitness for duty, including drug/alcohol program results and hours of service
- Liability losses
- Customer complaint information
- Changes to management, operations, or maintenance
- Studies of hazardous materials, spills, and environmental concerns
- Ad hoc studies of hazards and vulnerabilities

For every performance measure selected, FTA and transit agencies can develop baselines and targets against which to measure and compare performance. Meaningful performance targets are timely, accurate, accessible, and complete. When possible, it is best to analyze data over time to determine if trends are present.

Establishing baselines for performance measures provides grounded metrics as the basis for further and future comparison. Safety performance baselines may be established for individual transit agencies, for transit agency modes, and/or for the public transportation industry as a whole.[11] After a baseline is established, a transit agency can develop safety performance indictors and select safety performance targets to allow tracking of safety performance improvement progress. Performance should be measured at least annually by comparing actual performance metrics with targets and original baselines. If safety performance improves, an agency may choose to revise its safety performance targets to be more stringent or select different safety performance indicators and targets for improvement.

Transit safety performance can be measured using a number of measures, including lagging indicators such as accidents, fatalities, injuries, and property damage associated with transit agencies' provision of service, and leading indicators. Leading indicators provide a transit agency with the ability to monitor information or conditions that may affect safety performance. Lagging indicators provide information on events that have already taken place.

In the future, FTA intends to transition to include proactive measures and encourages transit agencies to do the same. Table 3-2 describes lagging and leading indicators in greater detail. In addition to the performance measures set forth in this Plan, FTA strongly encourages agencies to incorporate both lagging and leading indicators directly related to safety issues identified in their agencies as high risk into their performance management portfolio. Agencies should consider including positive measures that assess what people are doing rather than what they are failing to do.

[11] FTA and States can establish baselines for the performance measures within their SMS programs, as well.

Table 3-2. Lagging and Leading Indicators[12]

Lagging indicators characteristically:

- Identify trends in past safety performance
- Assess outcomes and occurrences
- Have a long history of use
- Are an accepted standard
- Are easy to calculate

Leading indicators are safety culture metrics that are associated with, and precede, an accident. They can:

- Reveal areas of weakness in advance of accidents
- Be associated with proactive actions to identify hazards
- Aid risk assessment and management

This is also the starting point from which FTA expects to advance through the development and implementation of a new strategic data management plan which will support the standardization of data and information collection and analysis. Standardized analyses and reporting will enable FTA to apply meta-analyses to transit safety performance results for better national-level monitoring of transit safety performance. Along with continued collaboration with States and the public transportation industry, this national-level monitoring will facilitate FTA's identification of opportunities to assist agencies in improving transit safety through technical assistance, research, and development of resource materials that address emerging safety issues.

FTA expects that each agency, regardless of size, will evaluate its own operating environment and safety concerns to determine its safety risks, link specific safety objectives to agency actions, develop measures for identified actions, and set performance targets based on the measures. After FTA issues a final rule for the Public Transportation Agency Safety Plan, each transit agency will be required to reevaluate its safety performance measures annually when reviewing and updating its agency

[12] Adapted from *Guidance Notes on Safety Culture and Leading Indicators of Safety*. American Bureau of Shipping (ABS), page 3. Available at http://www.eagle.org/eagleExternalPortalWEB/ShowProperty/BEA%20Repository/Rules&Guides/Current/188_Safety/Guide

safety plan, and determine how these measures should be refined, sub-measures developed, and performance targets selected.

Safety Data Trends

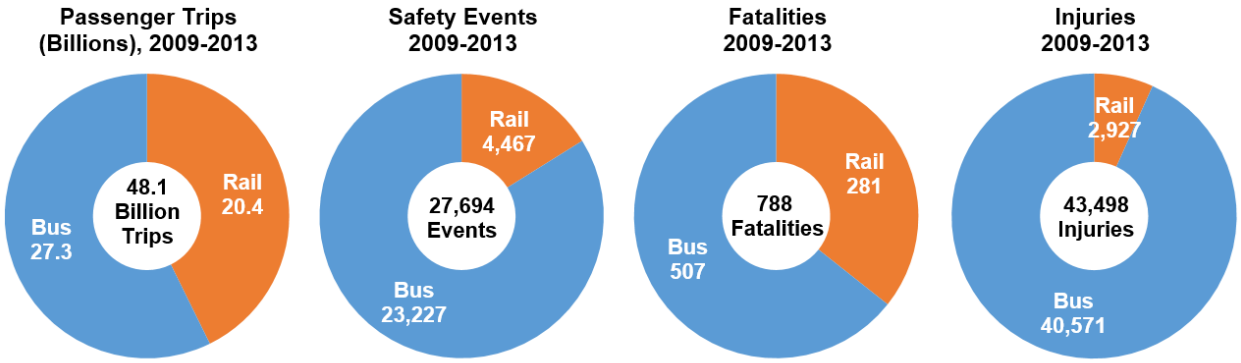
FTA currently maintains two sources for safety data reporting: the NTD, to which transit agencies report data as a condition for funding for public transportation agencies, and the State Safety Oversight (SSO) program, for rail transit modes that do not fall under the Federal Railroad Administration's jurisdiction. FTA utilizes these data sets to provide indicators of safety performance in outcome measures such as safety events, fatalities and injuries, as well as to provide trends in areas for which FTA believes additional focus may be warranted.

Current reporting of safety-related data and information in the transit industry is complex. Almost all transit agencies and modes report safety-related data to NTD.[13] Rail transit agencies also annually submit safety-related data and information to the NTD and FTA's SSO program through their State Safety Oversight Agency (SSOA). Small/rural transit agencies, mostly bus and paratransit modes, usually report NTD data as a grant sub-recipient through their SDOT. Bus operators in urban areas over 50,000 in population report directly to the NTD. Rural bus transit agencies report NTD data as a grant sub-recipient through their State Department of Transportation.

SAFETY EVENTS, FATALITIES AND INJURIES, 2009 – 2013

During the period 2009 – 2013, bus transit accounted for a majority of the industry's passenger trips, as well as the majority of safety events, fatalities and injuries. While rail transit accounted for 42% of all passenger trips, only 16% of safety events were attributable to rail transit. However, this 16% share of safety events resulted in 36% of all transit fatalities, but only seven percent of injuries reported. In other words, rail-related safety events have occurred less frequently, but the average rail-related safety event had more catastrophic outcomes than the average bus-related safety event during the time period.

[13] Exceptions exist for small, rural transit agencies.



Sources: SSO program (rail safety data), NTD (service and bus safety data)

The following table presents transit safety metrics per 100 million passenger trips for the last five years. As an industry, safety events, fatalities and injuries show an upward trend, and through safety performance monitoring, FTA hopes that agencies can investigate the reasons for this trend, and mitigate identified causal safety risks. However, by itself, rail transit shows downward trends in fatalities and injuries.

Transit Safety Events, Fatalities, and Injuries
Per 100 Million Unlinked Passenger Trips (UPT) 2009-2013

Modes	Rate	2009	2010	2011	2012	2013	**Total**	Trendline
Rail	Event Rate	**22.5**	**22.6**	**22.2**	**20.4**	**22.1**	**21.9**	
	Fatality Rate	**1.3**	**1.2**	**1.2**	**1.7**	**1.4**	**1.4**	
	Injury Rate	**14.7**	**16.5**	**14.2**	**13.9**	**12.8**	**14.4**	
Bus	Event Rate	**83.5**	**83.2**	**83.8**	**84.1**	**90.5**	**85.0**	
	Fatality Rate	**1.6**	**1.7**	**1.7**	**2.1**	**2.1**	**1.9**	
	Injury Rate	**137.6**	**148.9**	**148.1**	**150.2**	**157.7**	**148.6**	
All Transit	Event Rate	**58.2**	**57.3**	**57.5**	**56.8**	**60.6**	**58.1**	
	Fatality Rate	**1.5**	**1.5**	**1.5**	**1.9**	**1.8**	**1.7**	
	Injury Rate	**86.5**	**92.5**	**90.9**	**91.6**	**94.5**	**91.2**	

Sources: SSO program (rail safety data), NTD (service and bus safety data)

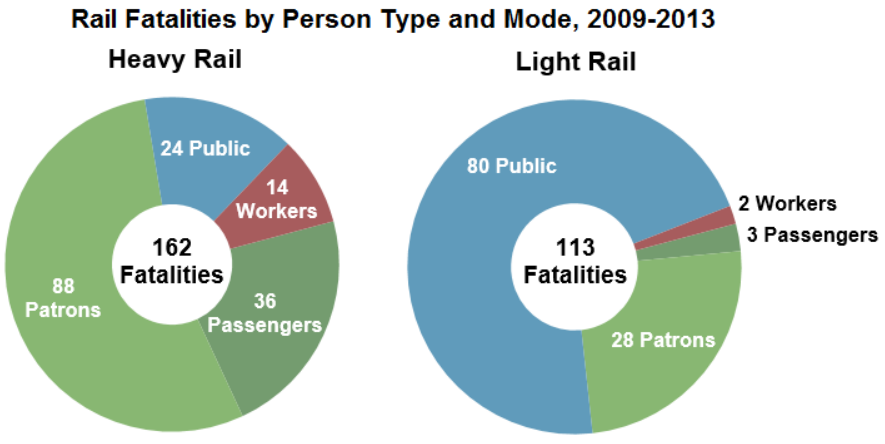
NOTE: Data includes safety events (reportable derailments, collisions, fires, and evacuations), fatalities (not including suicides or trespassers), and injuries (not including assaults or injuries due to crimes).

Over the five-year period from 2009-2013, transit agencies reported a total of 788 fatalities. 507 of these occurred in bus and other non-rail operating environments (64%), and 281 occurred in rail operating environments (36%).

When these data are normalized by looking at the number of fatalities divided by the number of passenger trips provided, the fatality rates over the last five years average 1.7 fatalities per 100 million passengers transported. This rate has been relatively steady, but has been trending slightly upward over the reporting period.

Heavy Rail and Light Rail Fatalities: 2009 - 2013

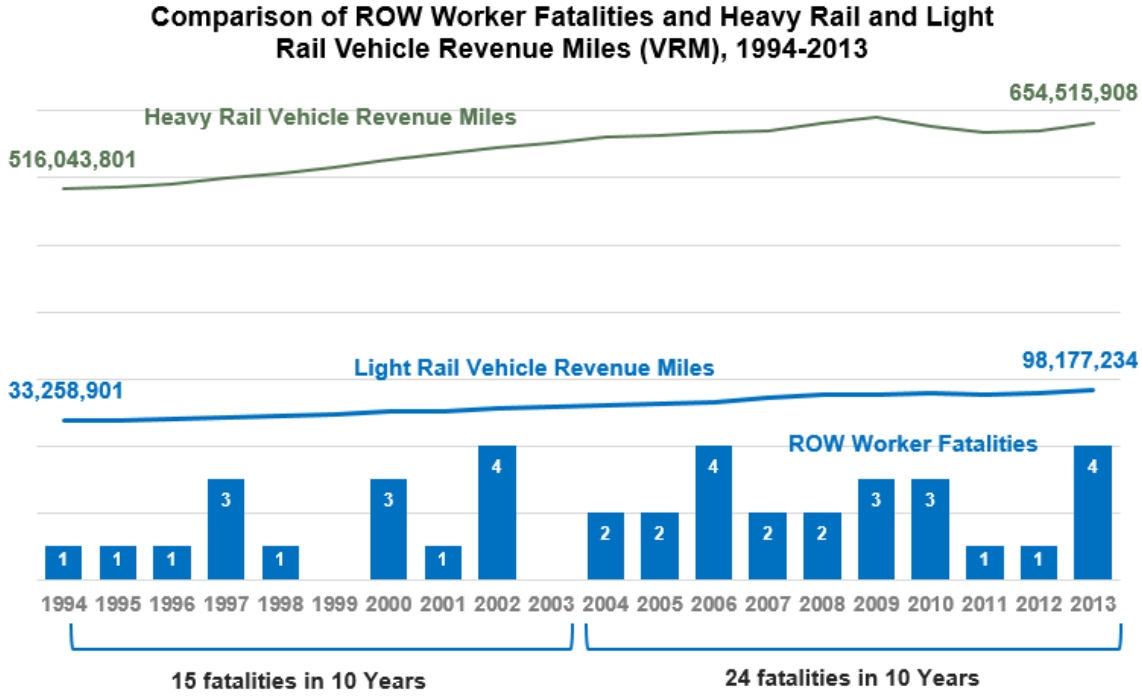
Fatality rates vary across rail modes due in large part to distinct operating environments and the inherent safety risk exposure associated with each. The charts below present heavy rail and light rail fatalities by person type, including passengers (customers onboard a transit vehicle), patrons (customers not onboard a vehicle), public (non-customers), and transit system employees, including right of way workers. It should be noted that heavy rail and light rail operations accounted for 275 of the 281 rail-related fatalities. An additional five fatalities occurred on automated guideway systems.



Source: SSO Program

Right of Way Worker Fatalities

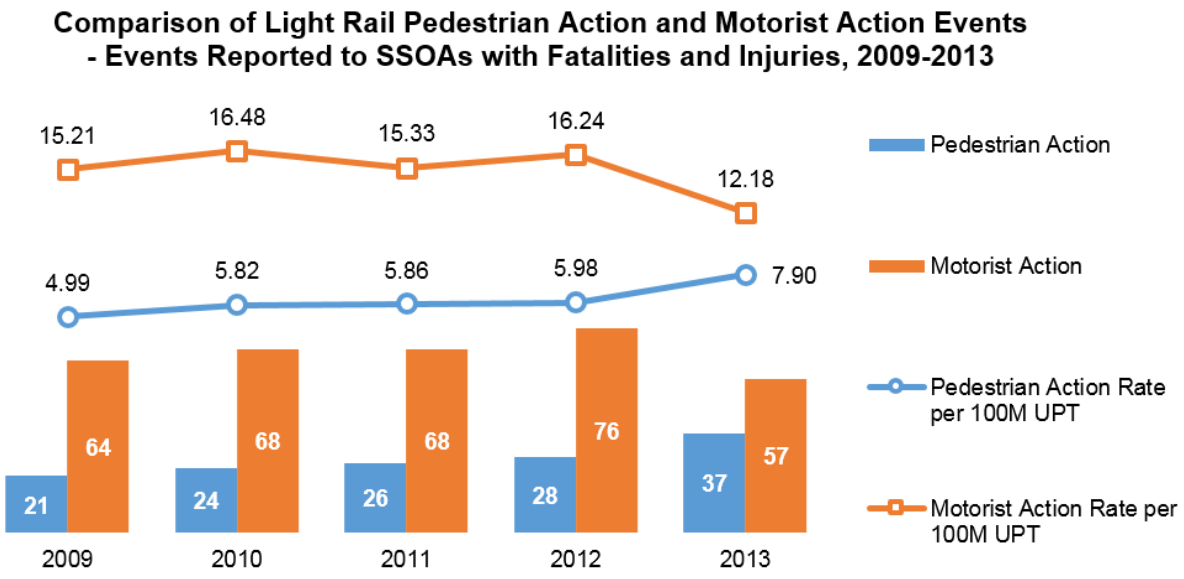
Fatality data reflect the exposure characteristics of particular types of operations (e.g., whether or not grade crossings exist, whether stations are enclosed, and how many customers are served). For example, heavy rail transit has experienced several right-of-way (ROW) worker fatalities in recent years. The chart below presents ROW fatalities for all rail modes over the last 20 years. Vehicle revenue miles have increased by about 39% over the past 20 years, increasing exposure for ROW workers.



Source: SSO Program

Rail Grade Crossing Events

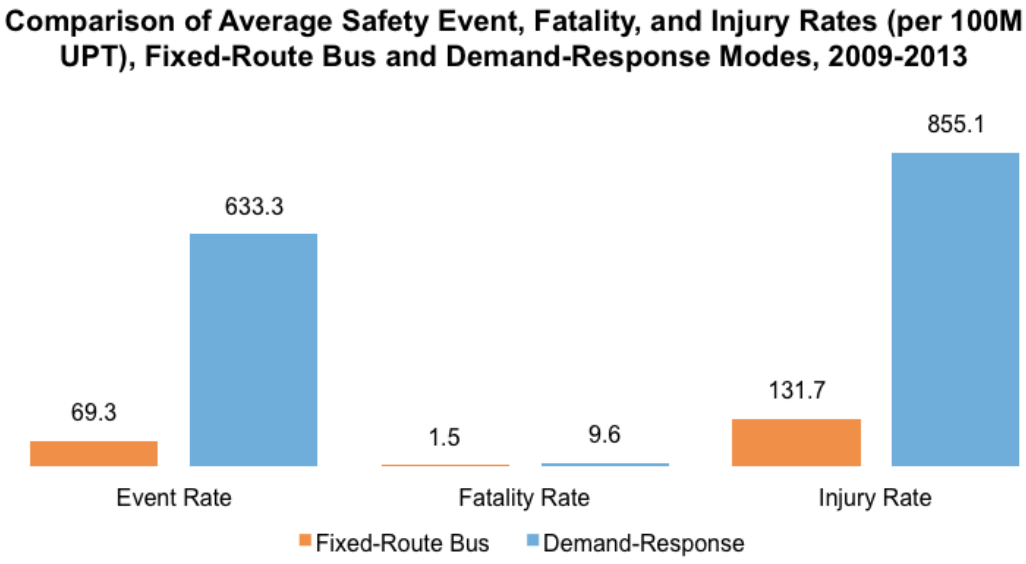
Light rail operating environments vary greatly from heavy rail systems. Light rail service utilizes rail grade crossings and even street-running alignments, increasing the exposure to vehicular and pedestrian traffic. Event data indicate a growing number of rail grade crossing events caused by pedestrians, as opposed to motor vehicles, underscoring the importance of ensuring safe transit access.



Sources: SSO program (rail safety data), NTD (service and bus safety data)

Bus and Paratransit Safety Events

Bus modes accounted for 27.3 billion trips between 2009 and 2013. This is 57% of the 48.1 total public transportation trips during the five-year period. Urban fixed-route bus modes represent 96% of these 27.3 billion trips. Demand response service and vanpools represent the remaining 4%. Data reveal that the safety performance of fixed-route bus modes is significantly better than demand response modes.



Source: NTD

Relationship between the National Safety Plan and Public Transportation Agency Safety Plans

In accordance with the statutory requirements of 49 U.S.C. § 5329(d)(1)(E), each transit agency must include in its public transportation agency safety plan, performance targets based on the safety performance measures established in this Plan. Each public transportation agency should establish sub-measures and related safety performance targets in their Public Transportation Agency Safety Plans that are appropriate to the agency's size and complexity.[14] Transit agencies will use these safety performance measures and targets to inform evaluation of the effectiveness of their SMS. These measures should evolve in subsequent years based on information learned through the Safety Risk Management and Safety Risk Assurance processes, and should help inform these activities.

The process of setting performance targets would require each transit provider to think quantitatively about its own safety needs and analyze what resources it could leverage to address those needs. How a transit provider sets its performance targets would be an entirely local process and decision; however, each provider should be able to explain what happened as a result of actions taken during the performance measurement period that affected its safety outcomes. For example, what mitigations were put in place that appear to have led to improved safety performance?

Relationship between Safety Performance and Transit Asset Management

The safety and performance of a public transportation system depend, in part, on the condition of its assets. When transit assets are not in a state of good repair, the consequences include increased safety risks, decreased system reliability, higher maintenance costs, and lower system performance.

In passing MAP-21, Congress recognized the critical relationship between safety and asset condition. We note, in particular, the congressional direction that the National

[14] Initially, some agencies may use output measures, such as the number of vehicles inspected, or the percentage of employees who have completed safety training. Outcome measures are useful for establishing benchmark performance and setting targets.

Safety Plan include the definition of *state of good repair* set in the rulemaking for asset management (49 U.S.C. § 5329(b)(2)(B)). The Transit Asset Management rule at 49 CFR part 625 define state of good repair as "the condition in which a capital asset is able to operate at a full level of performance." 49 CFR § 625.5.

Transit asset management is a strategic approach to improving and maintaining the condition of transit capital assets. The TAM rule aims to reduce the Nation's state of good repair backlog of deferred maintenance and replacement needs by requiring recipients to create TAM plans that will help them systematically address their maintenance needs, which will in turn improve service. Implementing a TAM plan will require transit agencies to collect and use asset condition data, set targets, and develop informed strategies to prioritize investments to meet their state of good repair goals.

TAM plans must include an asset inventory, condition assessments of inventoried assets, and a prioritized list of investments to improve the state of good repair of their capital assets. Recipients also must set SGR performance targets to monitor improvements in the condition of their assets. Implementing a TAM plan will require transit agencies to use data to make informed investment priorities to meet their state of good repair goals. Optimally, a transit agency's asset management planning process will work hand-in-hand with the agency's SMS for the mutual benefit of both, all under the leadership of the Accountable Executive. The following are three specific elements of the connection between safety and transit asset management:

1. **A condition assessment should direct and inform a transit agency's SMS**

The result of a condition assessment required under the TAM rule may oblige a transit agency to perform risk assessment and quality assurance--in accordance with the second and third pillars of SMS--for facilities, equipment, rolling stock, and infrastructure in poor condition. Although an asset that is in poor condition might not pose any specific safety risk to the transit system, that asset still might be prioritized for repair, rehabilitation, or replacement if the asset is negatively affecting system performance, reliability, or quality of service. Even for an asset that is in optimal condition, a transit agency may have reason to perform a risk assessment in light of its operating environment or other agency objectives (for example, resiliency for assets in flood zones).

2. **A transit agency's SMS will inform its TAM Plan and investment prioritization**

The results of safety risk management and safety assurance under a transit agency's SMS will provide valuable input to the agency's TAM Plan, and, in some instances, motivate the agency to revise its investment priorities accordingly. Ultimately, a transit agency makes its own decisions about trade-offs and investment priorities, based on the analytical processes, decision support tools and policies under its TAM Plan, and the agency's written policy for safety—the first pillar of an effective SMS—but the constant, deliberate feedback between the TAM Plan and the SMS will bring greater accountability and transparency to the agency's decision-making on the annual allocation of its financial resources.

3. **An agency's Accountable Executive should have a decision-making role in the agency's TAM Plan and investment prioritization**

The Accountable Executive who is ultimately responsible for risk management and safety assurance under a transit agency's SMS should be the same person who is responsible for approving the agency's capital plan and who makes decisions about investment prioritization. At minimum, however, the Accountable Executive should have a focal role in the transit agency's decision-making about the trade-offs amongst reinvestment in existing facilities, equipment, rolling stock, and infrastructure, versus investment in any new capital assets for purposes of improved performance of an expansion of service. Logically, the Accountable Executive for a transit agency's SMS would be either the General Manager or CEO. Across the industry, however, there are a variety of organizational structures for transit agencies, and in many agencies, the decisional authority for capital and operating expenditures lies with a Board of Directors. Whatever the structure of an organization, the Accountable Executive should engage with other agency executives in a candid, continuous dialogue about the connection between safety and transit asset management.

Positive changes in safety performance across public transportation will depend largely on a common understanding between transit asset management and safety, dedicated implementation of both a TAM Plan and Public Transportation Agency Safety Plan, and a targeted safety oversight and monitoring program. The performance measures and targets for both safety and transit asset management will enable transit agencies and

FTA to quantify our progress in enhancing safety and improving the condition of our facilities, equipment, rolling stock, and infrastructure through continuous performance management.

Relationship between Safety Performance Management and Planning

The safety performance targets set by transit providers, along with other performance targets set pursuant to other statutes, are an essential component of the planning process. The planning provisions at 49 U.S.C. 5303 and 5304 require States and MPOs to establish performance targets for transit that are based on the national measures for state of good repair and safety established by FTA and to coordinate the selection of those performance targets, to the maximum extent practicable, with performance targets set by transit providers to ensure consistency. 5303(h)(2)(B)(ii), 5304(d)(2)(B)(ii).

Furthermore, the Long Range Statewide Transportation Plan should and the Metropolitan Transportation Plan shall include: (1) a description of the performance measures and targets; and (2) a report evaluating the condition of the transit system(s) with respect to the State and MPO performance measures and targets, including the progress achieved in meeting performance targets compared with system performance recorded in previous years. 49 U.S.C. 5303(i)(2)(B) and (C), 5304(f)(7). Transportation improvement programs (TIPs) and statewide transportation improvement programs (STIPs) must include, to the maximum extent practicable, a discussion of the anticipated effects of the TIP/STIP toward achieving the performance targets in the Statewide and Metropolitan Transportation Plans by linking investment priorities to those performance targets. 49 U.S.C. 5303(j)(2)(D), 5304(g)(4).

The integrated planning process mandated by MAP-21 and the FAST Act should result in States and MPOs being able to identify investment and management strategies to improve or preserve the condition of transit capital assets in order to achieve and maintain a state of good repair.

FTA strongly encourages transit providers, States, and MPOs to set meaningful progressive targets, based on creative and strategic leveraging of all available financial resources. Although the law does not provide FTA with the authority to reward transit providers for meeting a performance target, or impose penalties for missing a

performance target, FTA believes that the process of setting targets and measuring progress reflects the increased expectations for improving transit safety.

Chapter IV - Managing Safety Risk and Assuring Safe Performance

FTA will apply the principles and methods of SMS to drive activities that mitigate risk and improve the safety performance of public transportation. FTA activities will guide, support, and monitor the implementation of the SMS framework across the transit industry. Using a risk-based oversight approach, FTA will initially focus on data collection and ongoing communication to support the analysis and identification of nationwide safety trends.

FTA will rely on several different tools to communicate actions to improve safety performance within the public transportation industry including future iterations of the Plan, rules, safety directives, safety advisories, training, establishment of safety performance standards and tasking to the Transit Advisory Committee for Safety (TRACS).

FTA SAFETY DIRECTIVES

Section 5329 provides FTA with several explicit authorities to administer the Safety Program and to take enforcement actions, including issuing directives. The Public Transportation Safety Program Rule (49 CFR part 670) establishes two types of directives—general directives and special directives. General directives are generally applicable and will be issued through the *Federal Register* and subject to public comment. Special directives apply to one or more named entities based on a specific set of facts. FTA will issue special directives directly to the named recipient(s).

For more information on the procedural rules related to the issuance of a general or special directive, please refer to the Public Transportation Safety Program rule at https://www.gpo.gov/fdsys/pkg/FR-2016-08-11/pdf/2016-18920.pdf.

FTA SAFETY ADVISORIES

FTA has issued several Safety Advisories to the public transportation industry. An advisory is a notice from FTA to the transit industry that recommends a particular action to mitigate an existing or potential hazard or risk. While compliance is not mandatory, FTA strongly encourages transit agencies to take the actions recommended in an advisory.

FTA has issued the following advisories to the transit industry:

Contact Rail (Third Rail) System Hazards (FTA Safety Advisory 16-2, May 16, 2016)

Safety Advisory 16-2 requests information from State Safety Oversight Agencies regarding the condition and safety performance of contact rail (third rail) traction power electrification systems at the Rail Fixed Guideway Public Transportation Systems in their jurisdictions.

Stop Signal Overruns (FTA Safety Advisory (FTA Safety Advisory 16-1, April 12, 2016)

Safety Advisory 16-1 requests that State Safety Oversight Agencies (SSOAs) work with their Rail Fixed Guideway Public Transportation Systems (RFGPTS) to obtain information regarding stop signal overruns during calendar year 2015.

Audit All Rail Fixed Guideway Public Transportation Systems (RFGPTS) with Subway Tunnel Environments (FTA Safety Advisory 15-1, June 17, 2015)

Safety Advisory 15-1 informs rail fixed guideway public transportation systems (RFGPTS) of planned audits to be conducted by State Safety Oversight Agencies (SSOAs). This safety advisory identifies specific areas of concern identified by the National Transportation Safety Board (NTSB) in regards to subway tunnel environments.

Vintage/Heritage Trolley Vehicle B and K Operating Controllers (FTA Safety Advisory 14-3, August, 1, 2014, updated August 6, 2014)

Safety Advisory 14-3 advised rail transit agencies that operate reconditioned vintage/heritage trolley vehicles manufactured before January 1956 of the risk of fire

with B and K operating controllers. The advisory refers operators to the APTA industry standard and the California Public Utilities Commission's General Order on the topic.

Verification of Rail Vehicle Safe Stopping Distances in Terminal Stations (Safety Advisory 14-2, June 12, 2014)

Safety Advisory 14-2 alerted rail transit operators of the need to assess the adequacy of safe stopping distances for rail transit trains in emergency braking in terminal stations. The advisory urges each rail transit agency to immediately conduct a review of the configuration of terminal stations in order to verify that designed safe braking distances address the actual operating conditions of these stations.

Redundant Protection to Protect Unintended Train Movement in Rail Yards (Update to Urgent Safety Advisory 10-4-13, Mar. 10, 2014)

FTA issued an update to the Urgent Safety Advisory following the publication of NTSB's preliminary report recommending FTA issue an advisory asking all rail transit properties to review their operating and maintenance procedures for stored unoccupied cars to ensure the propulsion and brake systems are left in a condition that would not facilitate unintended movement and that redundant means of stopping unintended rail car movements are used. The update recommends that each rail transit agency:

- Conduct a safety risk assessment to evaluate the adequacy of practices and procedures in place to manage the movement and storage of out-of-service railcars in yards and maintenance facilities.

- Review procedures for cleaning electrical equipment, with special attention to conduit entry points and other areas susceptible to unintended water intrusion or contamination from the cleaning process.

- Document the results of the assessments, and take action to address any identified concerns or issues requiring further investigation.

Right-of-Way Worker Protection (Safety Advisory 14-1, Dec. 31, 2013)

Safety Advisory 14-1 requested that State Safety Oversight (SSO) agencies coordinate with the rail transit agencies in their jurisdiction to identify current practices in place to

protect roadway workers, and conduct a formal hazard analysis regarding workers' access to the roadway and how the protections identified address the consequences associated with each hazard.

Unintended Train Movements (Urgent Safety Advisory, Oct. 4, 2013)

FTA issued an Urgent Safety Advisory instructing rail transit agencies to immediately review their own operating practices to utilize redundant train stopping mechanisms such as wheel chocks and/or derails in response to the NTSB's safety recommendation R-14-03.

FTA's safety advisories are available at **https://www.transit.dot.gov/regulations-and-guidance/safety/transit-safety-oversight-tso.**

VOLUNTARY MINIMUM VEHICLE SAFETY PERFORMANCE STANDARDS FOR PROCUREMENT OF HEAVY AND LIGHT RAIL[15]

Many public transportation agencies already follow voluntary consensus-based standards developed by APTA and other organizations. While compliance with the standards is not mandatory, FTA strongly encourages all public transportation agencies to consider adopting these voluntary, consensus-based standards and recommended practices included herein. As FTA segues towards the implementation of mandatory requirements through the Federal rulemaking process, it is committed to working with public transportation officials to develop rules ensuring that all public transportation agencies, regardless of size, may confidently procure assets that are safe and improve the safety potential of the public transportation industry.

Recent high-profile accidents involving light rail and heavy rail transit vehicles have highlighted the need for rail vehicle safety standards. In several of these accidents, vehicle crashworthiness contributed to injuries and casualties.[16] Furthermore, NTSB has

[15] These standards do not apply to heritage and vintage streetcar systems, inclined planes, cable cars, or monorails/automated guideway systems, nor do they apply to bus or paratransit service, though FTA reserves the right to issue subsequent regulations to these vehicles and their safe operation.
[16] WMATA's Ft. Totten crash, June 22, 2009; WMATA's Woodley Park/Adams Morgan crash, November 3, 2004, and MBTA's Newton Green Line crash, May 28, 2008.

recommended, among other things, that crashworthiness be addressed by FTA and the transit industry, along with implementation of positive train control systems.

In light of these factors, FTA strongly encourages that agencies consider the following rail vehicle safety standards when procuring heavy and light rail vehicles. They address vehicle crashworthiness, fire-life safety, vehicle data recorders, and emergency lighting and signage. These voluntary standards reflect existing best practices and effectively address several NTSB recommendations:

American Society of Mechanical Engineers (ASME) Safety Standard for Structural Requirements for Heavy Rail Vehicles (ASME RT-2 2008).[17] This standard addresses part of NTSB recommendation R-06-06 by recommending crashworthiness standards for rail vehicles operated in heavy rail transit systems.

ASME Safety Standard for Structural Requirements for Light Rail Vehicles (ASME RT-1 2009).[18]This standard addresses crashworthiness for rail vehicles operated in light rail transit systems.

Institute of Electrical and Electronics Engineers (IEEE) Standard for Rail Transit Vehicle Event Recorders (1482.1-2013).[19] This standard addresses NTSB recommendation R-02-019, which recommends event data recorders meeting this standard be installed on new, and retrofitted onto existing rail transit vehicles to facilitate accident investigations and causal analysis.

Emergency Lighting System Design for Rail Transit Vehicles (APTA RT-S-VIM-20-10).[20] This standard establishes minimum performance standards for emergency lighting for rail transit vehicles. This standard, used in conjunction with Emergency Signage for Rail Transit Vehicles and Low-location Emergency Path Marking for Rail Transit Vehicles, is intended to facilitate safe egress routes, paths, and exits for passengers aboard rail transit vehicles. This standard addresses NTSB recommendation R-06-05.

[17] http://files.asme.org/Catalog/Codes/PrintBook/28205.pdf.
[18] http://files.asme.org/Catalog/Codes/PrintBook/28205.pdf.
[19] http://standards.ieee.org/findstds/standard/1482.1-2013.html.
[20] http://www.apta.com/resources/standards/Documents/APTA-RT-VIM-S-020-10.pdf.

Emergency Signage for Rail Transit Vehicles (APTA RT-S-VIM-021-10).[21] This standard establishes minimum performance standards for emergency signage for rail transit vehicles to enable passengers to identify safe egress. Used in conjunction with Emergency Lighting System Design for Rail Transit Vehicles and low-location Emergency Path Marking for Rail Transit Vehicles, this standard is intended to facilitate safe egress routes, paths, and exits for passengers aboard rail transit vehicles. This standard addresses NTSB recommendation R-06-05.

Low-Location Emergency Path Marking for Rail Transit Vehicles (APTA RT-S-VIM-022-10).[22] This rail vehicle standard sets minimum standards for emergency path lighting for rail transit vehicles. Used in conjunction with Emergency Lighting System Design for Rail Transit Vehicles and Emergency Signage for Rail Transit Vehicles, this standard is intended to facilitate safe egress routes, paths, and exits for passengers aboard rail transit vehicles. This standard addresses NTSB recommendation R-06-05.

National Fire Protection Association Standard for Fixed Guideway Transit and Passenger Rail Systems (NFPA 130).[23] In response to NTSB's urgent recommendation R-15-7, this standard establishes fire protection and life safety requirements for underground, surface, and elevated fixed guideway transit and passenger rail systems. Additionally, FTA highly recommends implementation of Recommended Fire Safety Practices for Rail Transit Materials Section[27] as prepared by the National Association of State Fire Marshals for FTA.

While FTA encourages rail transit agencies to make enhancements during vehicle retrofits and overhauls, as well as when purchasing new vehicles, FTA is aware of cost barriers that may limit improvements on existing vehicles in revenue service, and encourages transit agencies to adopt these voluntary standards to the extent practicable.

On August 1, 2016, FTA published a final rule for bus testing to improve the process of ensuring the safety and reliability of new transit buses.[24] The rule satisfies requirements in MAP-21 to establish minimum performance standards, a standardized scoring

[21] http://www.apta.com/resources/standards/Documents/APTA-RT-VIM-S-021-10.pdf.
[22] http://www.apta.com/resources/standards/Documents/APTA-RT-VIM-S-022-10.pdf.
[23] http://catalog.nfpa.org/2014-NFPA-130-Standard-for-Fixed-Guideway-Transit-and-Passenger-Rail-Systems-P1229.aspx?icid=B484.
[24] https://www.gpo.gov/fdsys/pkg/FR-2016-08-01/pdf/2016-17889.pdf.

system, and a pass-fail threshold that will better inform local transit agencies as they evaluate and purchase buses. Vehicles procured with federal funds are required to pass a test to meet certain thresholds for structural integrity, safety, maintainability, reliability, fuel economy, emissions, noise, and performance.

VOLUNTARY MINIMUM SAFETY PERFORMANCE STANDARDS FOR OPERATIONS

Operational safety standards also contribute to a public transportation system's overall performance. FTA strongly encourages recipients to adopt minimum standards to improve their operational safety. FTA believes that the following operational standards reinforce FTA's commitment to safety and aligns FTA with the other DOT modal administrations that have already instituted regulations addressing issues like distracted driving and operator fatigue. The following voluntary minimum operational standards are part of the APTA standards development program:

APTA-RT-OP-S-017-11, Electronic Device Distraction Policy (NTSB's Top Ten Most Wanted).[25] This standard applies to rail transit systems. The standard provides minimum requirements for the use and prohibition of electronic devices for rail transit operators and employees working on or around rail tracks and facilities.

APTA-RT-OP-S-016-11, Roadway Worker Protection Program Requirements (R-12-32 to -35; R-13-39 to -40, and R-14-36 thru -43).[26] This standard sets minimum requirements to ensure the safety of roadway workers at a rail transit system.

APTA-RT-OP-S-004-03, Standard for Work Zone Safety (R-12-32 to -35; R-13-39 to -40, and R-14-36 thru -43).[27] This standard establishes minimum requirements for a rail transit system's Work Zone Safety Rules and Procedures, and applies to both mainline and yard operations.

APTA-RT-OP-S-010-03, Standard for Contractor's Responsibility for Right of Way Safety (R-12-32 to -35; R-13-39 to -40, and R-14-36 thru -43).[28] This standard identifies

[25] http://www.apta.com/resources/standards/Documents/APTA-RT-OP-S-017-11.pdf.
[26] http://www.apta.com/resources/standards/Documents/APTA-RT-OP-S-016-11.pdf.
[27] http://www.apta.com/resources/standards/Documents/APTA-RT-OP-S-004-03.pdf.
[28] http://www.apta.com/resources/standards/Documents/APTA-RT-OP-S-010-03.pdf.

requirements for a contractor's responsibilities for knowing, complying with, and enforcing a rail transit system's guidelines, rules and procedures. This standard governs a contractor's activities when performing inspection, investigation, design, construction and/or any other work on or near a rail transit system.

APTA-RT-OP-S-011-10, Rule Compliance (R-2-18).[29] This standard applies to rail transit systems that operate light and heavy rail systems and sets minimum requirements for operating rules.

TRANSIT ADVISORY COMMITTEE FOR SAFETY (TRACS)

TRACS is a formal advisory committee that provides FTA advice on safety issues, as tasked by the FTA Administrator. TRACS membership represents a cross-section of stakeholders in transit safety – representing transit agencies, State Safety Oversight agencies, labor unions, and safety research experts. Information about TRACS responsibilities, actions, and reports are available at https://www.transit.dot.gov/tracs-work-group.

A selection of reports developed by TRACS is presented below:

Establishing a Fatigue Management Program for the Bus and Rail Transit Industry – TRACS was tasked by the FTA Administrator with developing recommendations for FTA on the elements that should comprise a Safety Management System (SMS) approach to a fatigue management program. Using an SMS approach, the report presents TRACS' recommendations regarding the components of a successful fatigue management program, including hours of service (HOS), shift scheduling, fatigue prevention and awareness training, fitness-for-duty medical evaluations and screenings, work and vehicle environment design, safety culture, incident investigation, and data collection.

Preventing and Mitigating Transit Worker Assaults in the Bus and Rail Transit Industry – In 2014, the (FTA) Administrator tasked the Transit Advisory Committee for Safety (TRACS) with developing recommendations for FTA on the elements that should

[29] http://www.apta.com/resources/standards/Documents/APTA-RT-OP-S-011-10.pdf.

comprise a Safety Management System (SMS) approach to preventing and mitigating transit worker assaults. Best practice recommendations included:

- Installing protective barriers, video surveillance, automatic vehicle location (AVL) systems, and overt or covert alarms on bus and rail transit vehicles;
- Training safety-sensitive employees about how to de-escalate potentially violent situations, the important of reporting assaults, and the standard agency response to reports of assault;
- Educating the public about reporting assaults by conducting public awareness campaigns, providing resources and incentives for passengers to report assaults, and meeting with passengers to discuss strategies for preventing assaults;
- Providing support for transit workers by offering psychological support and post-incident counseling, responding to every report of assault or other serious incident, and involving transit workers in safety committees;
- Enforcing transit agency policy by posting passenger codes of conduct, suspending service for assailants, posting police officers on transit vehicles and property in high-risk areas, providing legal support for transit workers who file complaints, and collaborating with other agencies and organizations to develop social safety plans and advocate for changes in state and local legislation to better address assaults against transit; and
- Collecting data regarding the number, location, times, and types of assaults.

Implement SMS in Rail Transit Systems – Originally, TRACS was established to address weaknesses in rail transit system oversight and provide guidance to FTA as to how best to approach its enhanced oversight role and improve rail system safety. TRACS recommended that FTA adopt SMS for rail transit systems, and recommended that FTA proceed with a set of actions to support SMS implementation.

Close Call Reporting Systems – TRACS recommended that FTA initiate a work group comprised of stakeholders to facilitate the development of a confidential, non-punitive, close call safety reporting system, beginning with a pilot program. FTA is proceeding with this recommendation as it develops an SMS Implementation Program.

Contents of the National Safety Plan and the Agency Safety Plans – Following the passage of MAP-21, TRACS developed recommendations regarding the elements that should be contained in each of these sets of plan requirements, and FTA incorporated

TRACS input during development of this plan and the rulemaking documents. TRACS recommended that FTA base the plans on SMS, establish a means to assess and protect sensitive data, establish training and requirements for State Safety Oversight and provide tools to the industry to communicate the performance-based approach that underpinned Congress' intent in this legislation.

Currently, TRACS is researching, and in the process of developing recommendations for FTA that address Improving Safety Culture and Safety Data and Performance Management. The current taskings request TRACS members to (1) develop practical recommendations detailing how processes, practices, tasks, and individual employee responsibilities can support a strong safety culture and (2) develop recommendations that help define the functional requirements and data elements of a comprehensive safety data collection and analysis framework to support improvements in the transit industry's safety performance respectively.

How will the National Safety Plan be updated?

FTA has committed to reviewing and updating this Plan periodically. At a minimum, FTA will analyze transit industry safety performance data, refine national safety performance measures, and as a result of this analysis, report on the progress of the national implementation of SMS. FTA will report on national safety performance trends identified through data collected, safety audits, examinations, and inspections.

FTA will also share any lessons learned on the status of safety culture in the public transportation industry through training and communication of best practices.

Appendix A

Glossary

Accident means an event that involves any of the following: a loss of life; a report of a serious injury to a person; a collision of rail transit vehicles; a runaway train; an evacuation for life safety reasons; or any derailment of a rail transit vehicle, at any location, at any time, whatever the cause.

Accountable Executive, (typically the highest executive in the agency) means a single, identifiable person who has ultimate responsibility for carrying out the Safety Management System of a public transportation agency, and control or direction over the human and capital resources needed to develop and maintain both the agency's Public Transportation Agency Safety Plan, in accordance with 49 U.S.C. 5329(d), and the agency's Transit Asset Management Plan in accordance with 49 U.S.C. 5326.

Event means an accident, incident, or occurrence.

Hazard means any real or potential condition that can cause injury, illness, or death; damage to or loss of the facilities, equipment, rolling stock, or infrastructure of a public transportation system; or damage to the environment.

Incident means an event that involves any of the following: a personal injury that is not a serious injury; one or more injuries requiring medical transport; or damage to facilities, equipment, rolling stock, or infrastructure that disrupts the operations of a transit agency.

Major Mechanical Failures are failures caused by vehicle malfunctions or subpar vehicle condition which requires that it be pulled from service.

Passenger means a person other than an operator who is on board, boarding, or alighting from a vehicle on a public transportation system for the purpose of travel.

Safety Assurance means the process within a transit agency's Safety Management System that functions to ensure the implementation and effectiveness of safety risk mitigation, and to ensure that the transit agency meets or exceeds its safety objectives through the collection, analysis, and assessment of information. .

Safety Management Policy means a transit agency's documented commitment to safety, which defines the transit agency's safety objectives and the accountabilities and responsibilities of its employees in regard to safety.

Safety Management System (SMS) means the formal, top-down, data-driven, organization-wide approach to managing safety risk and assuring the effectiveness of a transit agency's safety risk mitigation. SMS includes systematic procedures, practices, and policies for managing risks and hazards.

Safety objective means a general goal or desired outcome related to safety.

Safety performance means an organization's safety effectiveness and efficiency, as defined by safety performance indicators and targets, measured against the organization's safety objectives.

Safety performance indicator refers to a data-driven, quantifiable parameter used for monitoring and assessing safety performance.

Safety Performance Measure is an expression based on a quantifiable indicator of performance or condition that is used to establish targets and to assess progress toward meeting the established targets.

Safety performance monitoring means activities aimed at the quantification of an organization's safety effectiveness and efficiency during service delivery operations, through a combination of safety performance indicators and safety performance targets.

Safety performance target means a quantifiable level of performance or condition, expressed as a value for a given performance measure, achieved over a specified timeframe related to safety management activities.

Safety Promotion means a combination of training and communication of safety information to support SMS as applied to the transit agency's public transportation system.

Safety risk means the assessed probability and severity of the potential consequence(s) of a hazard, using as reference the worst foreseeable, but credible, outcome.

Safety risk assessment means the formal activity whereby a transit agency determines Safety Risk Management priorities by establishing the significance or value of its safety risks.

Safety Risk Management means a process within a Rail Transit Agency's Safety Plan for identifying hazards, assessing the hazards, and mitigating safety risk.

Safety risk mitigation means the activities whereby a public transportation agency controls the probability or severity of the potential consequences of hazards.

Safety risk probability means the likelihood that a consequence might occur, taking as reference the worst foreseeable–but credible–condition.

Safety risk severity means the anticipated effects of a consequence, should it materialize, taking as reference the worst foreseeable–but credible–condition.

Serious Injury means any injury which: (1) Requires hospitalization for more than 48 hours, commencing within seven days from the date of the injury was received; (2) results in a fracture of any bone (except simple fractures of fingers, toes, or nose); (3) causes severe hemorrhages, nerve, muscle, or tendon damage; (4) involves any internal organ; or (5) involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface.

State of Good Repair means the condition in which a capital asset is able to operate at a full level of performance.

Vehicle Revenue Miles (VRM) Means the miles that vehicles are scheduled to or actually travel while in revenue service. Vehicle revenue miles include:

- Layover / recovery time. Exclude:
- Deadhead;
- Operator training;
- Vehicle maintenance testing; and
- School bus and charter services.

Appendix B

Sample

Safety Management Policy Statement

The management of safety is one of our core business functions. [Transit agency] is committed to developing, implementing, maintaining, and constantly improving processes to ensure that all our transit service delivery activities take place under a balanced allocation of organizational resources, aimed at achieving the highest level of safety performance and meeting established standards.

All levels of management and all employees are accountable for the delivery of this highest level of safety performance, starting with the [Chief Executive Officer (CEO)/Managing Director/or as appropriate to the organization].

[Transit agency] commitment is to:

• **Support** the management of safety through the provision of appropriate resources, that will result in an organizational culture that fosters safe practices, encourages effective employee safety reporting and communication, and actively manages safety with the same attention to results as the attention to the results of the other management systems of the organization;

• **Integrate** the management of safety among the primary responsibilities of all managers and employees;

• **Clearly define** for all staff, managers and employees alike, their accountabilities and responsibilities for the delivery of the organization's safety performance and the performance of our safety management system;

• **Establish and operate** hazard identification and analysis, and safety risk evaluation activities, including an employee safety reporting program as a fundamental source for safety concerns and hazard identification, in order to eliminate or mitigate the safety risks of the consequences of hazards resulting from our operations or activities to a point which is consistent with our acceptable level of safety performance;

• **Ensure** that no action will be taken against any employee who discloses a safety concern through the employee safety reporting program, unless disclosure indicates, beyond any reasonable doubt, an illegal act, gross negligence, or a deliberate or willful disregard of regulations or procedures;

• **Comply** with, and wherever possible exceed, legislative and regulatory requirements and standards;

• **Ensure** that sufficient skilled and trained human resources are available to implement safety management processes;

• **Ensure** that all staff are provided with adequate and appropriate safety-related information and training, are competent in safety management matters, and are allocated only tasks commensurate with their skills;

• **Establish and measure** our safety performance against realistic and data-driven safety performance indicators and safety performance targets;

• **Continually improve** our safety performance through management processes that ensure that appropriate safety management action is taken and is effective; and

• **Ensure** externally supplied systems and services to support our operations are delivered meeting our safety performance standards.

_____

[Accountable Executive]

_____

Date