



September 2021

PUBLIC TRANSPORTATION

Identifying Lessons Learned Could Help Improve FTA's Process to Manage Safety Risks

Accessible Version



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GAO Highlights

Highlights of [GAO-21-104029](#), a report to congressional requesters

Why GAO Did This Study

In recent years, new laws gave the Department of Transportation's FTA additional requirements and authorities to oversee transit safety. In turn, FTA now requires, among other things, transit agencies to develop new safety plans that incorporate SMS to manage and mitigate safety risk. FTA also incorporated SMS in its transit agency oversight to better identify and assess safety risks, and determine appropriate mitigation efforts, including mandatory safety standards.

GAO was asked to examine how FTA is implementing its new responsibilities and authorities. This report examines (1) selected transit agencies' experiences in incorporating SMS in their new safety plans; (2) steps FTA is taking to identify, assess, and mitigate safety risks; and (3) FTA's status on mandating safety standards and stakeholders' views on the benefits and challenges of such standards. GAO reviewed FTA documents on safety oversight policies and practices and interviewed officials from 12 transit agencies and their 9 respective state oversight agencies. GAO selected transit agencies to reflect a variety of modes, sizes, age, and geographic diversity.

What GAO Recommends

GAO recommends that FTA identify and document lessons learned from the camera pilot, including a plan to implement needed changes. DOT concurred with this recommendation and provided technical changes to the draft report, which we incorporated as appropriate.

View [GAO-21-104029](#). For more information, contact Andrew Von Ah at (202) 512-2834 or vonaha@gao.gov.

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Identifying Lessons Learned Could Help Improve FTA's Process to Manage Safety Risks

What GAO Found

Of the twelve selected transit agencies GAO spoke with, most faced challenges incorporating the Federal Transit Administration's (FTA) requirements to develop and document its Safety Management Systems (SMS) in their new agency safety plans. SMS is a performance-based, data-driven framework to manage safety risks throughout an organization. Some rail transit agencies noted difficulties transitioning from the former 21-element safety plan to SMS and its four required components. However, most transit agencies said they benefited from FTA's assistance. FTA's assistance included guidance documents, webinars, and training. Upon request, FTA also reviewed transit agencies' draft safety plans, providing lessons learned from those reviews.

FTA established a Safety Risk Management (SRM) process to identify, assess, and mitigate safety risks across the nation's transit agencies. During the initial implementation, FTA selected four safety concerns to review (see fig. below). According to FTA, the use of cameras on rail transit was a pilot project, and FTA has completed four of the five steps in its process for the camera safety pilot. Though FTA continues to evaluate that pilot and work on the other three safety concerns, it has not completed actions to prepare for future rounds of the SRM process. In particular, FTA has not identified and documented lessons learned from the pilot. Documenting and incorporating such lessons could enhance the effectiveness and timeliness of FTA's SRM process and thus FTA's ability to address transit-wide safety risks.

GAO's Assessment of the Status of the Safety Risk Management (SRM) Process for Four Safety Issues under Review by the Federal Transit Administration (FTA)

Federal Transit Administration (FTA) safety concerns	Safety Risk Management steps				
	Identify safety concern	Assess safety risk	Develop mitigation measures	Implement mitigation measures	Monitor safety performance
Use of cameras	●	●	●	●	◐
End-of-railcar signage	●	◐	◐	○	○
Signal system safety	●	◐	◐	○	○
Roadway worker protections	●	●	◐	○	○

● Completed
◐ Partially completed
○ Not completed

Source: GAO analysis of FTA documentation and interviews of FTA officials, as of June 2021. | GAO-21-104029

Data table for GAO’s Assessment of the Status of the Safety Risk Management (SRM) Process for Four Safety Issues under Review by the Federal Transit Administration (FTA)

Federal Transit Administration (FTA) safety concerns	Identify safety concern	Assess safety risk	Develop mitigation measures	Implement mitigation measures	Monitor safety performance
Use of cameras	Completed	Completed	Completed	Completed	Completed
End of railcar signage	Completed	Partially completed	Partially completed	Not Completed	Not Completed
Signal system safety	Completed	Partially completed	Partially completed	Not Completed	Not Completed
Roadway worker protections	Completed	Completed	Partially completed	Not Completed	Not Completed

Source: GAO analysis of FTA documentation and interviews of FTA officials, as of June 2021. | GAO-21-104029

FTA continues to gather information while it considers whether to mandate certain transit safety standards. FTA has issued safety bulletins for rail cameras and end-of-railcar signage. These bulletins suggest but do not require certain actions related to the installation of cameras and signage in rail transit cars. FTA, however, has not yet initiated a rulemaking for any mandatory federal safety standards. While the diverse nature of the transit industry can make setting federal safety standards challenging, transit agencies GAO spoke with were generally open to mandatory safety standards for some safety issues. For example, many of the selected transit agencies expressed support for requiring medical examinations of employees, as well as other so-called human-factor safety risks.

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Abbreviations

APTA	American Public Transportation Association
DOT	Department of Transportation
FAA	Federal Aviation Administration
FAST Act	Fixing America's Surface Transportation Act
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
MAP-21	Moving Ahead for Progress in the 21st Century Act
NTD	National Transit Database
NTSB	National Transportation Safety Board
SMS	Safety Management System
SRM	Safety Risk Management
SSOA	State Safety Oversight Agency
TRACS	Transit Advisory Committee for Safety
WMATA	Washington Metropolitan Area Transit Authority

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September 14, 2021

The Honorable Sherrod Brown
Chairman
Committee on Banking, Housing, and Urban Affairs
United States Senate

The Honorable Mike Crapo
United States Senate

Public transportation is a critical component of the nation's transportation system. Public transportation agencies provide light- and heavy-rail, bus, trolley, streetcar, ferry, and other transportation services to millions of people in both urban and rural areas. Until this past decade, ensuring the safety of public transportation systems was largely the responsibility of states. After a series of high profile accidents, especially on rail transit systems, the U.S. Department of Transportation (DOT) was charged with playing a larger role in transit safety oversight. Two key federal surface transportation reauthorization acts—the Moving Ahead for Progress in the 21st Century Act (MAP-21), enacted in 2012,¹ and the Fixing America's Surface Transportation Act (FAST Act), enacted in 2015²—amended federal transit law to direct DOT to, among other things, implement a national public transportation safety program.³ Further, the FAST Act provides DOT the authority both to establish safety standards for public transportation and, under certain circumstances, to temporarily assume federal safety oversight of states' rail transit systems to ensure safety of

¹ Pub. L. No. 112-141, 126 Stat. 405 (2012).

² Pub. L. No. 114-94, 129 Stat. 1312 (2015).

³ In general, the term "public transportation" is defined as regular, continuing shared-ride surface transportation services that are open to the general public or open to a segment of the general public defined by age, disability, or low-income. 49 U.S.C. § 5302(14). For the purposes of this report, when we discuss transit agencies and transit systems, we are referring to those that receive federal public transportation financial assistance under 49 U.S.C. Chapter 53, and not overseen by another federal agency, such as the Federal Railroad Administration.

the system.⁴ Within DOT, the Federal Transit Administration (FTA) is responsible for implementing these authorities.

To enhance the safety of public transportation in the United States, FTA has adopted the principles and methods of Safety Management Systems (SMS), and now requires transit agencies in urbanized areas⁵ and certain rail transit agencies receiving federal transit funding to adopt SMS principles and methods as well. FTA describes SMS as a formal, top-down, organization-wide data-driven approach to managing safety risk and to assure the effectiveness of an agency's safety risk mitigations. SMS is intended to include systematic procedures, practices, and policies for managing risks and hazards. We have previously noted that SMS adoption and implementation requires cultural and procedural transformation and could take years of continuous efforts by both agency and industry officials.⁶ SMS has also been identified by the National Transportation Safety Board (NTSB) as one of the most critical changes needed to reduce the number of accidents and save lives.⁷

In light of these changes, you asked us to review FTA's implementation of its new regulatory authority. Specifically, we examined:

1. selected transit agencies' experiences, including the use of FTA assistance, in developing new agency safety plans to incorporate SMS;
2. FTA's implementation of internal processes for identifying, assessing, and mitigating transit safety risks; and

⁴ To date, FTA has assumed federal oversight of a transit rail system once, when in October 2015, it assumed temporary and direct safety oversight of the Washington Metropolitan Area Transit Authority (WMATA) Metrorail system. FTA relinquished its oversight in March 2019 with the transfer of direct safety oversight to WMATA's new state safety oversight agency, the Washington Metrorail Safety Commission.

⁵ The U.S. Census defines an urbanized area as a developed continuous area with a population of 50,000 or more.

⁶ In particular, we previously found that it took the Federal Aviation Administration (FAA)—the first federal transportation agency to adopt SMS in 2005—almost 10 years to completely implement SMS. See GAO, *Aviation Safety: Additional Oversight Planning by FAA Could Enhance Safety Risk Management*, [GAO-14-516](#) (Washington, D.C.: June 25, 2014). Other DOT modal administrations, including the Federal Railroad Administration (FRA), have taken steps to adopt SMS.

⁷ In addition to advocating that public transit incorporate SMS, NTSB has recommended that the aviation, railroad, highway, pipeline, and marine transportation industries adopt SMS.

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3. FTA's current status on setting safety standards and stakeholder views on the potential challenges and benefits to establishing federal safety standards for public transportation agencies.

For all three research questions, we reviewed pertinent federal statutes and FTA documents including regulations, policies, guidance, and planning documents. Specifically, for our first objective, we reviewed the status of transit agencies' agency safety plans, including how agencies were implementing new public transportation safety-planning requirements from FTA as a result of the 2018 final agency-safety-plan rule. For our second objective, we reviewed documents related to FTA's approach to identifying and assessing safety concerns. In particular, we obtained information on FTA's Safety Risk Management Process, including a review of FTA's standard operating procedures. In addition, we compared FTA documentation on its evaluation of specific safety concerns to the procedures for each step of the SRM. Based on this analysis, as well as clarification in interviews with FTA officials, we determined whether FTA had "completed," "partially completed," or "not completed" each step for the respective safety concern. For instance, if FTA provided us with documentation, including a Safety Concern Identification report, that they performed the identification step for a safety concern, we marked the step as completed. However, if FTA did not provide documentation for a step, we marked that step as "partially completed" or "not completed" depending on FTA's comments. For the third research question listed above, we reviewed documents related to FTA's processes for developing mitigation measures for identified transit safety risks across agencies.

For the first and third research questions, we interviewed officials from a non-generalizable sample of 12 transit agencies and nine state departments of transportation overseeing transit agencies, including state safety oversight agencies (SSOA) that oversee the rail systems of these transit agencies in our sample. Specifically, we conducted semi-structured interviews of 10 multi-modal transit agencies—including the seven largest in the nation, in terms of unlinked or total passenger trips—and two non-rail, bus transit agencies. We selected transit agencies to include the largest agencies, as well as a variety of modes, system age, and geographic diversity. We also interviewed the nine SSOAs that oversee the rail components of the 10 multi-modal transit agencies

regarding their role in performing oversight and certifying agency safety plans.⁸

For the first research question, we asked transit agencies about their experiences in meeting FTA's agency safety planning requirements and FTA's outreach and oversight role. We asked the transit agencies and SSOAs about both the SMS framework and implementing national safety standards, as well as challenges associated with meeting FTA's data and documentation requirements. For the third objective, we asked transit agencies about the potential challenges and benefits to establishing mandatory federal safety standards for public transportation agencies, as well as the role of voluntary industry safety standards.

For the second and third objectives, we interviewed officials from FTA's Office of Transit Safety and Oversight; Office of Strategic Planning and Analysis as well as FTA's Office of Research, Demonstration, and Innovation; and others, regarding FTA's role in transit agency oversight and enforcement, and its development and implementation of its safety programs. We also asked FTA officials about their efforts to develop safety mitigation measures for transit agencies and about potential benefits and challenges of implementing national minimum safety standards.

To support all three objectives, we also interviewed officials from other federal agencies, including the Federal Aviation Administration (FAA), the Federal Motor Carrier Safety Administration (FMCSA), the Federal Railroad Administration (FRA), and the National Transportation Safety Board (NTSB). We asked officials from these agencies about their experiences with or knowledge of implementing SMS and about the benefits and challenges of mandating minimum safety standards for the modal transportation systems they oversee. We interviewed NTSB officials about the findings and recommendations arising from their investigations of transit accidents. Finally, we talked with representatives

⁸ To obligate federal transit funds, states are federally required to have a state safety oversight program, including an SSOA. The SSOA is to provide the primary oversight of rail fixed guideway public transportation systems, which are defined as any fixed guideway system that uses rail, is operated for public transportation, is within the jurisdiction of a state, and is not subject to the jurisdiction of the Federal Railroad Administration, or any such system in engineering or construction. FTA oversees SSOAs through its triennial audits, among other things. Bus and other non-rail transit systems generally operate and are overseen by their states' department of transportation or a state-level oversight agencies unaffiliated with FTA. One of the SSOAs we spoke with oversees two of the transit agencies we interviewed.

from the American Public Transportation Association (APTA) about the benefits and challenges of relying on industry leading practices and voluntary standards versus federal safety standards.

We conducted this performance audit from January 2020 to September 2021 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

The federal role in public transportation has evolved since FTA's predecessor was established in 1964⁹ to provide financial assistance for transit projects. In subsequent years, the federal role was expanded to authorize investigations of unsafe public transit conditions. In 1991, after catastrophic accidents on certain rail transit systems, the federal role was expanded to include additional safety oversight. This change followed a critical report from the NTSB on the need for a better safety oversight program, and FTA was then statutorily charged with creating a state safety oversight program.¹⁰ To do this, FTA required states with rail transit systems to establish an SSOA to oversee rail transit systems in their respective states in order to avoid the withholding of funds for non-compliance. However, serious accidents on rail transit systems continued

⁹ FTA's predecessor organization, the Urban Mass Transportation Administration, was renamed the Federal Transit Administration by the Intermodal Surface Transportation Efficiency Act of 1991, Pub. L. No. 102-240, § 3004, 105 Stat. 1914, 2088.

¹⁰ According to FTA, in enacting this provision, "the Congress agreed with NTSB that the States, not FTA, should be the principal oversight authorities for rail transit within their jurisdictions, given that public transportation is an inherently local activity that, with few exceptions, did not cross state boundaries." 80 Fed. Reg. 11002, 11004 (Feb. 27, 2015). The 1991 legislation also directed FTA to set certain parameters for states' safety oversight programs and SSOAs' obligations for states to follow. After additional high-profile accidents on rail transit systems, MAP-21 expanded FTA's authorities of the oversight program, to improve the effectiveness of states' safety oversight agencies.

to occur and we and NTSB continued to raise concerns about safety oversight.¹¹

The passages of MAP-21 in 2012 and the FAST Act in 2015 provided FTA with more authority and responsibilities for safety oversight. As noted above, FTA developed a Public Transportation Safety Program to improve the safety of the United States' public transportation systems. This program provides the framework for FTA to monitor, oversee, and enforce transit safety, based on the methods and principles of SMS. The Public Transportation Safety Program comprises five main elements:

1. a national public transportation safety plan;
2. a safety certification training program for federal, state, and local transportation agency employees with safety oversight responsibilities;
3. public transportation agency safety plans;¹²
4. a strengthened state safety oversight program for rail transit, as discussed above; and

¹¹ See GAO, *Rail Transit: Federal Administration Can Strengthen Oversight by Improving Guidance to States*, [GAO-18-310](#) (Washington, D.C.: Mar. 20, 2018). In response to our recommendations, FTA has (1) created and is carrying out a plan, with a timeline, for developing risk-based inspection guidance for states; and (2) expanded its triennial audit assessments of SSOAs. These steps will better position FTA to identify any ineffective state safety enforcement and allow the FTA to be better able to remedy safety deficiencies. See also GAO, *Rail Transit: Observations on FTA's State Safety Oversight Program and Potential Change in Its Oversight Role*, [GAO-10-314T](#) (Washington, D.C.: Dec. 10, 2009) and GAO, *Rail Transit: Additional Federal Leadership Would Enhance FTA's State Safety Oversight Program*, [GAO-06-821](#) (Washington, D.C.: July 26, 2006).

¹² Pub. L. No. 112-141, § 20021(a), 126 Stat. 405, 709 (2012) (codified as amended at 49 U.S.C. § 5329). According to APTA's 2020 *Public Transportation Fact Book*, there were 93 rail transit systems, over 1100 bus transit systems, and a myriad of other systems, including commuter bus and rail, demand response, transit vanpool, street cars, and passenger ferry boats. While FTA provides funding for different transit modes, it does not have safety oversight for some, such as commuter rail and passenger ferry boats. Agencies that operate passenger ferries regulated by the United States Coast Guard or rail fixed-guideway public transportation service regulated by the Federal Railroad Administration are not required to develop agency safety plans for those modes of service. 49 C.F.R. § 673.11(f).

5. a new framework for federal oversight and enforcement.¹³

State safety agencies and transit agencies are evaluated for continued compliance with FTA regulations a minimum of once every 3 years through a “triennial review” process.¹⁴

The FAST Act also required FTA to establish minimum safety standards for transit agencies.¹⁵ Further, the FAST Act required FTA to perform a review and evaluation of public transportation safety standards and protocols.¹⁶ FTA subsequently released a report in which it noted that “[d]ue to significant limitations of the safety-related data reported to the National Transit Database (NTD) and limited or non-existent data from other sources” it could not prepare a definitive assessment of the efficacy of the standards identified in its review and evaluation.¹⁷ In 2017, FTA issued a national public transportation safety plan, in which, among other things, FTA encouraged transit agencies to adopt voluntary minimum safety performance standards.¹⁸

¹³ MAP-21 also required DOT to establish and implement a national transit asset management system that measures the condition of capital assets of transit agencies receiving FTA transit funds. For an assessment of the transition to an asset management system, see GAO, *Transit Asset Management: FTA Should Clarify Performance Data and Develop a Plan to Guide Future Program Improvements*, [GAO-20-686](#) (Washington, D.C.: Sept. 30, 2020).

¹⁴ FTA is to conduct two separate statutorily required triennial review processes. Under 49 U.S.C. § 5307, FTA is to conduct a Triennial Review of each recipient to ensure compliance with statutory, regulatory, and administrative requirements in their implementation of Urbanized Areas Formula grant program. Under 49 U.S.C. § 5329, FTA is required to audit each State Safety Oversight Agency at least once every three years to oversee the implementation of each State safety program.

¹⁵ Pub. L. No. 114-94, § 3013, 126 Stat. 1312, 1476 (2015) (codified as amended at 49 U.S.C. § 5329(b)(2)(D)). Since the late 1990s, the APTA Standards Program has overseen the development of voluntary standards for all modes of public transportation. APTA’s standards cover, among other things, transit operations, maintenance, technology, and design of facilities and vehicles.

¹⁶ Pub. L. No. 114-94, § 3020, 126 Stat. 1312, 1491 (2015).

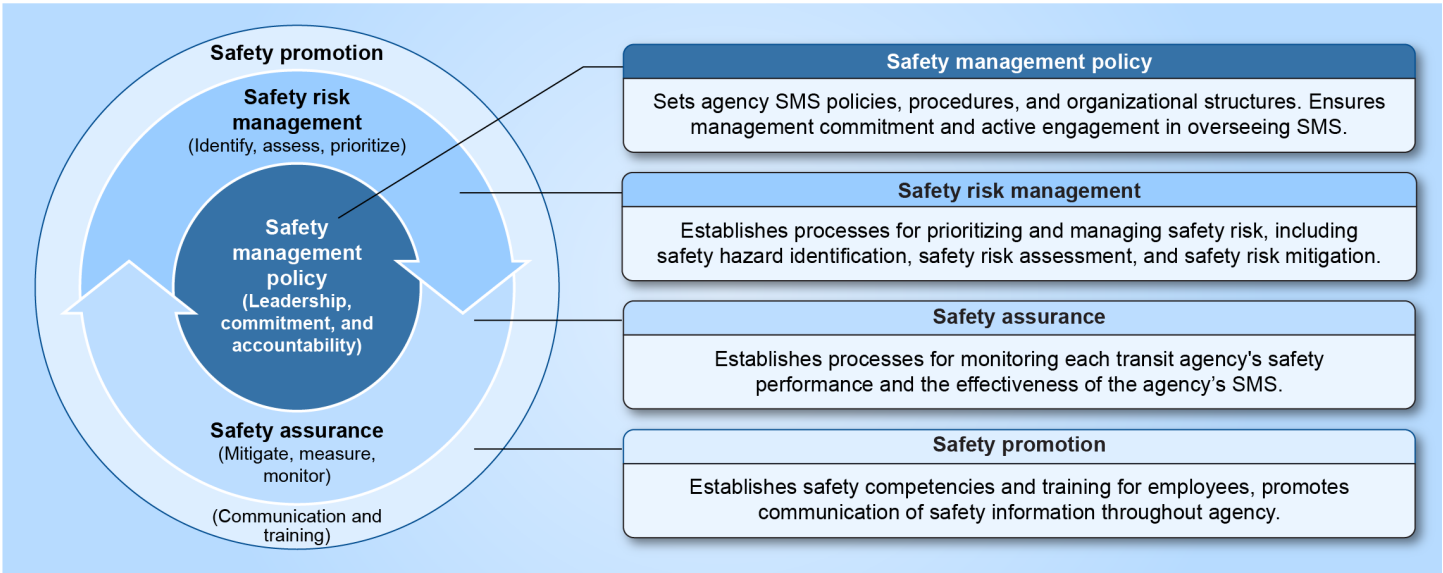
¹⁷ FTA, U.S. Department of Transportation, *Review and Evaluation of Public Transportation Safety Standards (FTA Report No. 0103)* (Washington, D.C., January 2017). The issue of significant limitations of the safety-related data reported to the National Transit Database is discussed later in this report.

¹⁸ Federal Transit Administration, U.S. Department of Transportation, *National Public Transportation Safety Plan*, version 1 (Washington, D.C.: January 2017).

FTA's Safety Management Systems Approach

SMS is intended to help organizations improve their safety performance by supporting the institutionalization of beliefs, practices, and procedures for identifying, mitigating, and monitoring safety risks. As noted above, SMS is now an integral part of safety oversight both within FTA and the transit agencies it oversees. SMS is not an additional safety program distinct from existing activities to accomplish an entity's safety mission; rather, it is a process for safety management that incorporates systematic procedures, practices, and policies. For example, whereas a traditional compliance approach to safety oversight may focus on following certain rules and procedures, an SMS approach focuses on identifying risks. Further, a traditional approach may be reactive, identifying causal factors and non-compliant individuals after accidents, whereas SMS is proactive, trying to identify and mitigate system risks before accidents. SMS includes four key components: (1) a safety management policy, (2) safety risk management, (3) safety assurance, and (4) safety promotion (see fig. 1).

Figure 1: FTA's Four Components of Safety Management Systems



Source: GAO analysis of Federal Transit Administration (FTA) information. | GAO-21-104029

Text of Figure 1: FTA's Four Components of Safety Management Systems

- Safety Management Policy: Sets agency SMS policies, procedures, and organizational structures. Ensures management commitment and active engagement in overseeing SMS.
- Safety risk management: Establishes processes for prioritizing and managing safety risk, including safety hazard identification, safety risk assessment, and safety risk mitigation.
- Safety assurance: Establishes processes for monitoring each transit agency's safety performance and the effectiveness of the agency's SMS.
- Safety promotion: Establishes safety competencies and training for employees, promotes communication of safety information throughout agency.

Source: GAO analysis of Federal Transit Administration (FTA) information. | GAO-21-104029

FTA's Safety Risk Management Process

To implement the safety risk management component of SMS as part of FTA's federal oversight role, in 2019 FTA developed a five-step Safety Risk Management (SRM) process for this component, including documenting formalized standardized operating procedures. Implementation of the process is led by FTA's Office of Transit Safety and Oversight as well as a Safety Assessment Team, which is comprised of officials across FTA. The Safety Assessment Team is responsible for conducting the assessments of safety risks using data from available sources, including data reported to the NTD, results from NTSB investigations, and reports from FTA's Transit Advisory Committee for Safety (TRACS), and proposing mitigation options that may address these risks. The mitigation options are presented to the Executive Safety Review Board for approval.¹⁹

¹⁹ TRACS provides information, advice, and recommendations on transit safety and other issues as determined by the Secretary of Transportation and the FTA Administrator. The committee is composed of an interdisciplinary group of transit experts and stakeholders.

Public Transportation Agency Implementation of SMS

By July 20, 2020, FTA recipients and subrecipients of Urbanized Area Formula funds were required to self-certify their compliance with FTA's public transportation-agency safety plan's requirements, including the adoption of SMS.²⁰ The new agency safety plans replaced rail transit agencies' system safety program plans and were a new requirement for non-rail transit modes. The new agency safety plans must document how transit agencies will use the four SMS components to manage transit safety. Key elements of the agency safety plans include:

- ensuring signed approvals of safety plans by accountable executives and approval by the agency's board of directors;
- establishing an employee safety reporting program, such as anonymous employee hotlines for reporting safety concerns;
- requiring training for staff and contractors directly responsible for safety; and
- developing a safety management policy statement, safety performance targets, and the methods the agency will use for identifying, assessing, and mitigating safety risks.

Pursuant to FTA's NTD requirements, certain transit operators must also report information, including data on safety events, to the NTD, FTA's centralized source for information and statistics on the nation's transit systems.

Selected Transit Agencies Experienced Challenges Incorporating SMS into Safety Plans, but FTA Is Helping with Implementation

Adopting SMS as Part of New Safety Plans Has Presented Organizational and Data Challenges for Transit

²⁰ 49 C.F.R. § 673.11(a)(2). In light of COVID-19 related challenges, FTA has announced that it will refrain from taking enforcement action until July 21, 2021 for recipients and subrecipients unable to certify compliance. FTA's public transportation agency safety plan requirements are specifically not applicable to an operator of a public transportation system that only receives federal financial assistance under 49 U.S.C. § 5310 (formula grants for enhanced mobility of seniors and individuals with disabilities), 49 U.S.C. § 5311 (formula grants for rural areas), or both 49 U.S.C. § 5310 and 49 U.S.C. § 5311. These agencies typically are smaller transit providers.

Agencies, Especially Rail Transit Systems, according to Selected Agencies

Of the 12 transit agencies we spoke with, all but three said that there were substantial differences between their former safety plans and the new agency plan requirements. Nine transit agencies specifically noted that making the transition to the SMS-based safety plans was challenging or difficult, while one—a bus transit agency—said that the new SMS requirements had minimal effect on them. Officials of rail transit agencies, which had been federally required to follow a system safety plan consisting of 21 elements, described how there were substantial differences between those system safety plans and the new SMS-based safety plans. Six of these agencies said that the 21 elements were mostly based on engineering standards and were more prescriptive—whereas the SMS-based plan was more performance- and management-based, consisting of four components—making it difficult to determine which of the 21 elements belong in which SMS component.²¹ There were other differences between the new and former plans, such as requiring a comprehensive training program for all employees directly responsible for safety in the agency’s public transportation system—not just the safety office—and to have the plan signed off by the accountable executive²² and approved by the board of directors. For instance, officials at a large transit agency described how it was a challenge to incorporate SMS requirements across the organization as it involved working with staff who were not familiar with safety issues. Even some transit officials with self-described decades of experience told us that even though they understand FTA’s new objectives, they still had much to learn under the new system.

Developing and maintaining a “safety culture” at a transit agency has also been a challenge, according to eight transit agencies we spoke with. FTA has stated that one of its goals is to create stronger and more positive

²¹ Rail transit agencies were previously required to develop System Safety Program Plans. According to FTA, the former safety approach adopted in those plans reflected an engineering discipline that incorporates safety into a transit system during its design and construction, and assumes that technical compliance with engineered solutions will help ensure safe compliance.

²² The accountable executive is typically the transit agency’s chief executive officer or general manager.

safety cultures within transit agencies.²³ Implementing this goal can require a cultural shift in an agency's management and safety approach. Officials from 7 of the 12 agencies we spoke with said they had to make organizational changes to better implement safety culture, such as setting up employee hotlines, conducting employee surveys, or greater communication to staff from upper management. However, it can be difficult to define and measure, as it can involve hard-to-quantify factors such as values, attitudes, and beliefs. In an attempt to quantify safety culture, two agencies we spoke with conducted a survey to measure attitudes toward safety; one of the two then used the survey to set a baseline for safety culture. Developing and maintaining a safety culture also requires an investment in continuous oversight and training, according to some transit agency officials we spoke with. According to some officials, changing the culture at an agency can take a long time, as employees at all levels of the agencies need to both understand the safety culture and implement it on a daily basis. They agreed that training is essential to accomplish this change in culture, but other actions and processes are also necessary and can vary by transit agency.

SMS also requires agencies to utilize data to set performance targets, which can be used to develop new safety baselines for the systems. Five of the 12 transit agencies we spoke with told us that setting new baselines has proved challenging, as they found issues with the NTD data and were not sure if the NTD safety data would help them accurately measure their safety performance across all relevant safety areas. Four transit agency officials told us that the NTD had seemingly inconsistent data definitions for certain types of incidences that agencies rely on to measure performance over time and to meet SMS requirements. Officials from one agency said it was challenging to determine what FTA wanted for reporting purposes and that responses from FTA officials did not always conform to FTA's written guidance. For example, officials from one agency told us that FTA's NTD currently requires agencies to report light rail trolley accidents at different locations as grade-crossing incidents, even if the accident did not occur at a grade crossing. Also, officials from two rail transit agencies stated it was unclear how to report certain events, including those that required evacuating individuals for life-safety reasons. Given that SMS is supposed to be data-driven, officials from six transit agencies told us that they were concerned about

²³ FTA has stated that an agency's executive buy-in to the agency safety plan is essential to help maintain a positive safety culture. Further, a positive safety culture means that transit staff would not feel pressure to rate all safety risks as low as possible and be willing to speak up about safety risks without a fear of retribution or retaliation.

the accuracy of NTD safety data and were hesitant about using the data for benchmarking their performance over time.

FTA Supported Transit Agencies' Transition to SMS through Technical Assistance and Guidance, and Plans to Make Additional NTD Updates

To help transit agencies develop new safety plans and adopt SMS, FTA provided technical assistance through a variety of methods. FTA developed guidance documents and held training and webinars that were designed to help explain what was needed in agency safety plans and how to develop SMS. FTA also provided voluntary reviews of draft agency safety plans to help agencies meet the new agency safety plan's requirements, and 5 of the 12 agencies we spoke with submitted their draft plans to FTA for review and guidance.²⁴ To assist all agencies, FTA issued lessons learned from their reviews of draft safety plans. For rail transit agencies, FTA provided a "roadmap" to help rail transit agencies transition from their former safety plans to the new agency safety plans. This roadmap provided a side-by-side comparison of the 21 formerly applicable safety plan elements and the four required SMS components under the new regulations. FTA also developed an agency safety-plan template for bus and sample plans for small and large bus transit agencies and provided guidance on setting performance targets.

Eleven of the 12 transit agency officials we spoke with told us that FTA's assistance was helpful as they developed their new agency safety plans. Some of these officials noted that FTA provided useful general information as well as direct assistance, including answering specific questions and providing training on certain issues. Officials from all 12 transit agencies we spoke with said they received FTA's guidance in the development of their new plans. FTA, acknowledging that the development of a positive safety culture could take years, held workshops focusing on how to build and maintain a positive safety culture. Also, the 5 of the 12 agencies that took advantage of FTA's voluntary agency safety-plan reviews told us that they found the reviews beneficial. While transit agencies said they found FTA guidance, and agency safety-plan templates generally helpful, three commented that it would have been more useful if they had received the guidance earlier in their process. For

²⁴ FTA created a Technical Assistance Center to assist transit agencies and state departments of transportation to meet their national public transportation agency safety plan requirements.

example, FTA issued some of its guidance more than a year after finalizing its agency safety plan rule, including an agency safety plan template for bus transit agencies, which FTA issued in September 2019. We also were told by transit agency officials that at times FTA did not answer specific questions. A problem the officials attributed to the likelihood that FTA officials were still trying to figure out the process.

Transit officials also told us that in addition to relying on FTA for guidance in developing their new plans, they relied on their states' safety oversight agencies, other modal system components of their agencies, other transit agencies, and, in some instances, contractors. Three agencies shared draft plans among each other, adopting ideas and lessons learned from them. According to officials from one rail transit system, they obtained advice from colleagues who worked in their bus system, which was already applying some SMS principles in their previously required safety plans.

FTA has taken steps to improve NTD safety data in recent years and FTA officials told us they intend to address NTD issues as part of a new plan next year. These steps are designed to help transit agencies develop new performance targets, as required by the new plans and discussed above. FTA officials told us that recent and planned improvements to the NTD include addressing some of the issues that stakeholders previously reported.²⁵ For instance, in 2018, FTA updated some safety data definitions in its NTD policy manual. Also, FTA officials stated they have identified the need to develop a strategic data management plan and are developing the goals and objectives for this plan. FTA also plans to clarify data definitions. Further, FTA indicated that it would use its triennial reviews of transit agencies that receive Urbanized Area Formula Grants (§ 5307) to ensure agency plans meet FTA requirements.

FTA Has Started to Implement a Risk Management Process to Address Transit Safety

²⁵ A 2017 TRACS report on transit safety data identified a range of issues with the NTD, including the need for more consistent reporting and "granular" data. It also outlined problems with the software itself, including problems performing queries of safety data and difficulties with the user interface.

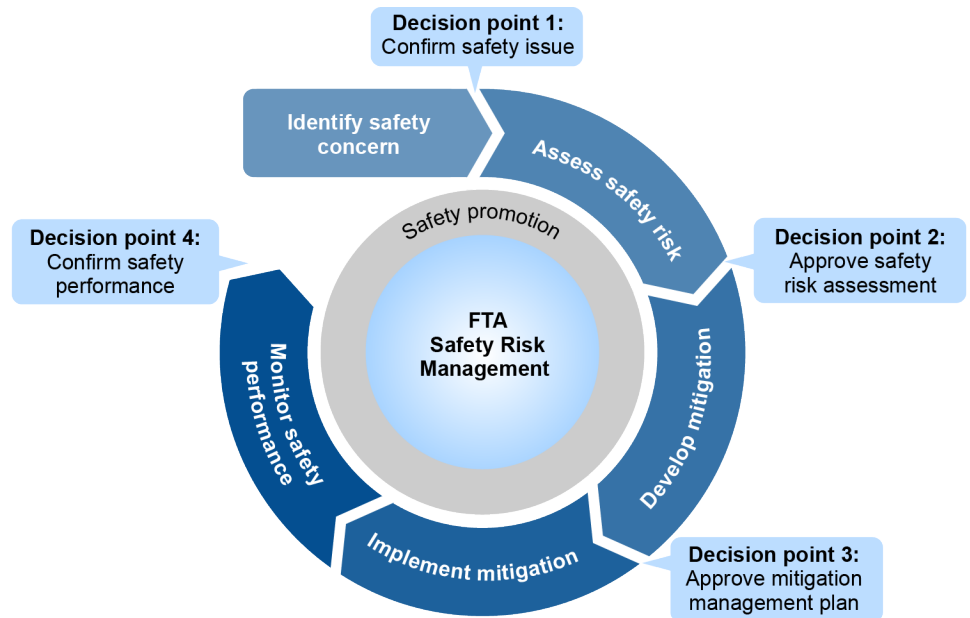
Risks but Has Not Identified Lessons Learned to Guide Future Efforts

As part of FTA's efforts to implement the SMS across the transit industry, FTA developed the five-step SRM process to address industry-wide safety concerns. Under this approach, FTA established a schedule to complete the SRM process for four safety concerns by the end of 2020. To date, FTA is in the final monitoring step for one safety concern it used as a pilot project to test and improve the SRM process. For the remaining three safety concerns, FTA officials told us they have completed some of the SRM steps but have yet to complete the other steps, including assessing safety risks. Furthermore, FTA has not developed a plan for identifying lessons learned from this initial round of the SRM process, a step that could help it determine whether its SRM process is operating as intended or would benefit from any revisions before the process is used to assess other safety issues in future rounds.

To Implement SMS, FTA Established a Process to Identify, Assess, and Mitigate Safety Concerns

FTA established the SRM process as part of its SMS to identify safety concerns and hazards, assess corresponding safety risk, and develop and implement mitigation strategies to manage those risks (see fig. 2).

Figure 2: Federal Transit Administration's (FTA) Safety Risk Management (SRM) Process



Source: GAO analysis of Federal Transit Administration (FTA) information. | GAO-21-104029

Text of Figure 2: Federal Transit Administration's (FTA) Safety Risk Management (SRM) Process

1. Identify safety concern
2. Decision point 1: Confirm safety issue
3. Assess safety risk
4. Decision point 2: Approve safety risk assessment
5. Develop mitigation
6. Decision point 3: Approve mitigation management plan
7. Implement mitigation
8. Monitor safety performance
9. Decision point 4: Confirm safety performance.

Source: GAO analysis of Federal Transit Administration (FTA) information. | GAO-21-104029

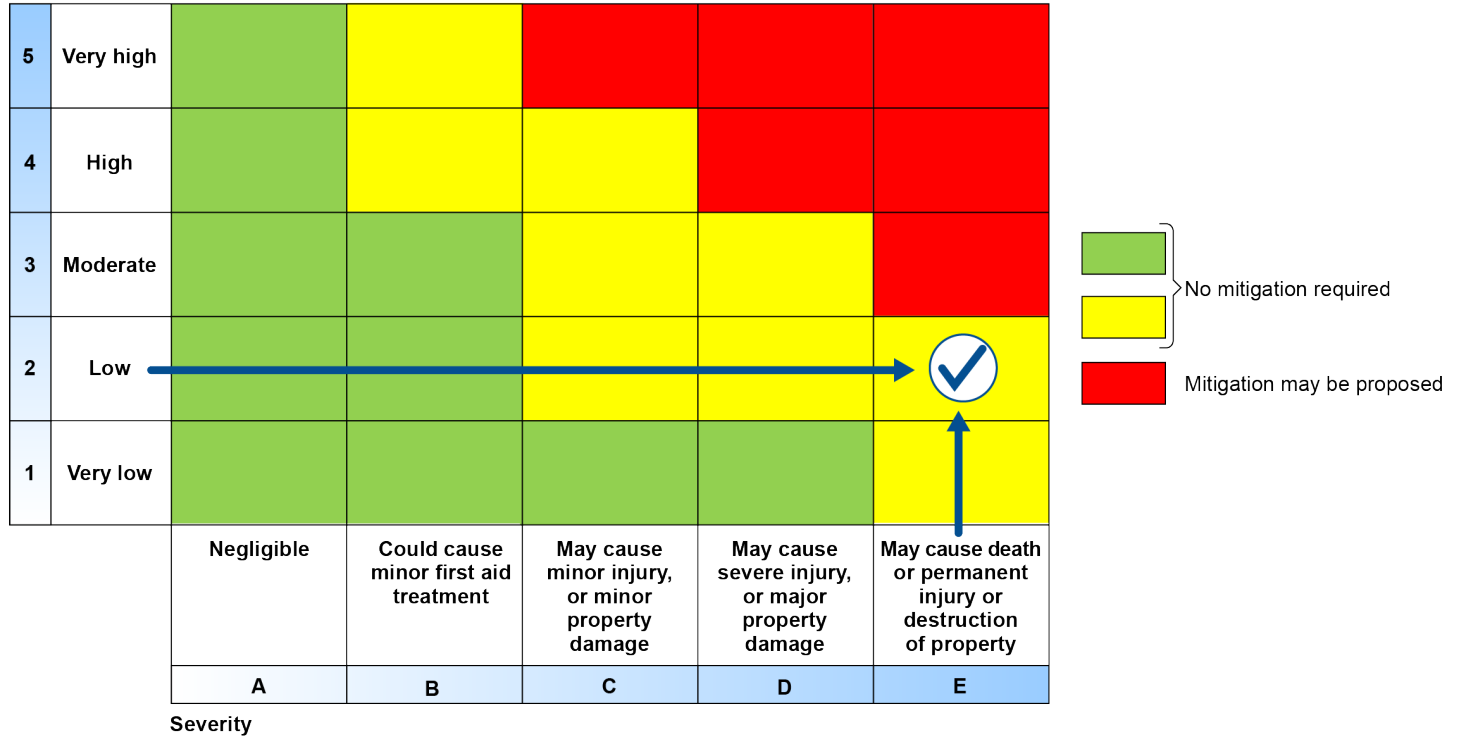
As laid out in its SRM standard-operating procedures, during SRM's first step, FTA uses a variety of sources, including FTA officials, industry stakeholders, and triennial audits of SSOAs and triennial reviews of

transit agencies to identify safety concerns and assess safety risks. FTA also relies on recommendations from NTSB investigations of transit accidents. Internally, FTA-funded safety standards research reports and recommendations from FTA's TRACS serve as inputs for the SRM process. Analyses of NTD safety data are also considered.

Once FTA fully defines a safety concern, it undergoes a safety risk assessment. These risk assessments are specific to each safety concern and developed by analyzing data to determine the severity, likelihood, and cost of each potential consequence that could arise from the risk. The Safety Assessment Team compiles and uses safety data from the NTD and other sources to evaluate the "worst foreseeable consequences of the safety concern and the probability of that consequence occurring" and plots on a matrix the risk level of each potential consequence that could arise, using their professional judgment. (See fig. 3 for the matrix that FTA put together for one potential consequence for a camera safety issue, also discussed further below). FTA officials then brief the Executive Safety Review Board regarding the results of the data and cost analyses and presents the safety risk-management matrix including potential mitigations. The Executive Safety Review Board then decides on whether the risks associated with the safety concern warrants actions or mitigations and which mitigations should be used.

Figure 3: Federal Transit Administration’s (FTA) Safety Risk Management (SRM) Matrix for Assessing Risks If Cameras Are Not Installed in Rail Cars for Use in Determining Causes of Accidents

Probability



Source: GAO analysis of Federal Transit Administration (FTA) information. | GAO-21-104029

Data table for Figure 3: Federal Transit Administration’s (FTA) Safety Risk Management (SRM) Matrix for Assessing Risks If Cameras Are Not Installed in Rail Cars for Use in Determining Causes of Accidents.

Probability	Severity				
	Negligible	Could cause minor first aid treatment	May cause minor injury, or minor property damage	May cause severe injury or major property damage	May cause death or permanent injury or destruction of property
5 – Very High	No mitigation required (green)	No mitigation required (yellow)	Mitigation may be proposed (red)	Mitigation may be proposed (red)	Mitigation may be proposed (red)
4 – High	No mitigation required (green)	No mitigation required (yellow)	No mitigation required (yellow)	Mitigation may be proposed (red)	Mitigation may be proposed (red)
3 – Moderate	No mitigation required (green)	No mitigation required (green)	No mitigation required (yellow)	Mitigation may be proposed	Mitigation may be proposed (red)
2 – Low	No mitigation required (green)	No mitigation required (green)	No mitigation required (green)	No mitigation required (yellow)	No mitigation required (yellow)
1 – Very low	No mitigation required (green)	No mitigation required (green)	No mitigation required (green)	No mitigation required (green)	No mitigation required (yellow)

Notes: This is the safety risk-management matrix that FTA produced for one potential consequence related to inward-and-outward-facing cameras on rail regarding the likelihood and severity of future events if cameras were used to better determine the cause of incidents. According to FTA, green areas of the matrix represent identified risks that are adequately mitigated while yellow areas are considered to represent minimal to moderate risks that require no mitigation measures. Red areas represent risks that may require additional mitigation measures. The risk here is considered to be of low likelihood.

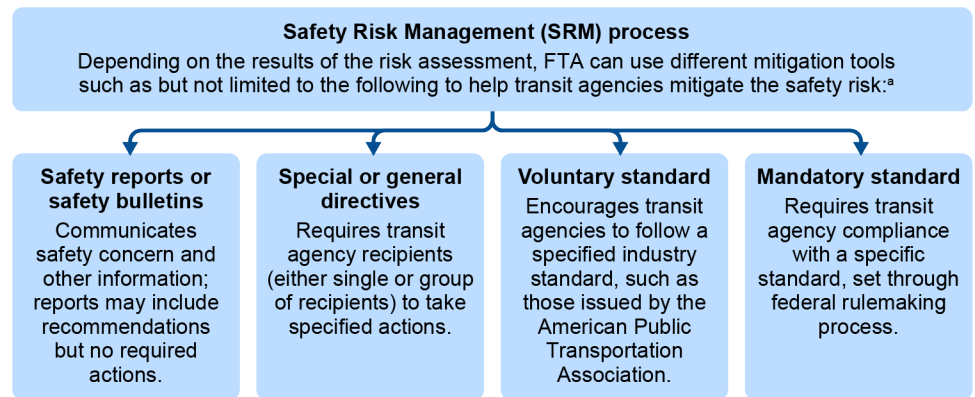
Source: GAO analysis of FTA data. | GAO-21-104029

As noted in figure 4 below, FTA has a variety of mitigation measures it can use to address safety concerns. For instance, at the individual transit agency level, FTA can specifically require more frequent reporting by the agency, issue corrective actions or special safety directives, direct how federal financial assistance can be spent, or withhold federal financial assistance until a risk is mitigated.²⁶ For the industry as a whole, FTA can issue safety reports or bulletins, special or general directives, voluntary standards, or mandatory standards. Safety bulletins include recommendations for transit agencies, rather than required directives. Safety directives are orders that require the recipient or group of recipients to take one or more specific actions for safety. FTA may also issue a mandatory safety standard as a mitigation measure.²⁷ In addition, FTA can use additional communication tools as mitigation measures, such as newsletters and webinars.

²⁶ For example, FTA used several actions during its temporary oversight of WMATA, such as issuing nine safety directives and withholding funds until FTA was satisfied with WMATA's corrective actions.

²⁷ Mandatory safety standards would be established through the federal-rulemaking process, according to FTA.

Figure 4: Federal Transit Administration's (FTA) Key Risk Mitigation Tools to Address Risks Identified in Its Safety Risk Management (SRM) Process



Source: GAO analysis of Federal Transit Administration (FTA) information. | GAO-21-104029

Text of Figure 4: Federal Transit Administration's (FTA) Key Risk Mitigation Tools to Address Risks Identified in Its Safety Risk Management (SRM) Process

1. Safety Risk Management (SRM) process. Depending on the results of the risk assessment, FTA can use different mitigation tools such as but not limited to the following to help transit agencies mitigate the safety risk.^a
2. Safety reports or safety bulletins. Communicates safety concern and other information; reports may include recommendations but no required actions.
3. Special or general directives. Requires transit agency recipients (either single or group of recipients) to take specified actions.
4. Voluntary standard. Encourages transit agencies to follow a specified industry standard, such as those issued by the American Public Transportation Association.
5. Mandatory standard. Requires transit agency compliance with a specific standard, set through federal rulemaking process.

Note: FTA has a variety of mitigation measures that can be used to address safety concerns, including more frequent agency reporting to FTA, corrective actions, withholding of financial assistance, or temporary direct oversight—which FTA imposed on the Washington Metropolitan Area Transit Authority. The mitigation measures discussed above are generally targeted for the transit industry at large (or a sub-category of transit systems).

Source: GAO analysis of Federal Transit Administration (FTA) information. | GAO-21-104029

Once the Executive Safety Review Board approves the desired mitigation measure, a mitigation management plan is developed to document the activities to be used to reduce the risks of the safety concern and obtain information regarding monitoring the effectiveness of mitigation

measures. The plan also contains a timeline and assigns those transit officials or agencies that will be accountable for the activities and timelines. As a final step, FTA designs a process for monitoring the performance of the mitigation measures.

Of the Four FTA-Identified Safety Concerns, FTA Is in the Final Monitoring Step Only for One Safety Concern

FTA identified four safety concerns to be reviewed in the initial round of the SRM process, focused on rail transit. These concerns included:

- the use of inward-and-outward facing audio and image recorders (cameras);
- end-of-rail-car door signage and messaging (signage);
- signal system safety (signals), and
- roadway worker protections.²⁸

FTA established a timeline to assess the four safety concerns using its SRM process from June 2019 to December 2020. FTA officials told us that these four initial safety issues were primarily identified in connection with NTSB recommendations but that FTA also considered information from other sources, including research on the greatest safety concerns facing transit.²⁹ FTA chose the use of inward- and outward-facing cameras in rail systems as a pilot project. The purpose of this pilot was: to test the effectiveness of each SRM process step and decision point, to refine the tools and templates to support the process, to better

²⁸ Signal system safety refers to basic safety-critical systems controlling the movement of trains including both formal signal systems and operator compliance with signals; end-of-car signage refers to signs placed at the end of rail cars to warn occupants that moving between cars is unsafe; roadway worker protections refers to rules and procedures to keep transit workers safe while working along transit roadways, and the use of inward-and-outward facing cameras refers to the installation of cameras inside the cab to monitor safety risks either inside or outside of the cab compartment.

²⁹ FTA officials told us they use different inputs to decide which safety concerns to review, including a research report that identified seven areas of the greatest concerns. These concerns included roadway worker protection, collisions at grade crossings, and collisions involving trespassers as well as suicides, among other things. However, FTA officials told us they primarily used NTSB recommendations to identify safety concerns so far. FTA does not consider the outcomes of the SRM processes to be formal responses to NTSB recommendations.

understand time requirements of each step, and to make improvements to the process based on lessons learned from the pilot.

As of June 2021, FTA has not completed the five-step process for all four safety concerns. As we discuss below, FTA is in the last step for the camera safety concern and at different steps for the other three safety concerns. According to FTA officials, delays were partially due to helping transit agencies address fiscal, safety, and operational challenges posed by the COVID-19 pandemic. Figure 5 illustrates our assessment of FTA's progress assessing these safety concerns, based on interviews with FTA officials and documents they provided. FTA continues to work on the SRM process for the three safety issues that have not reached the final steps.

Figure 5: Status of the Safety Risk Management (SRM) Process for Four Safety Issues under Review by Federal Transit Administration (FTA)

Federal Transit Administration (FTA) safety concerns	Safety Risk Management steps				
	Identify safety concern	Assess safety risk	Develop mitigation measures	Implement mitigation measures	Monitor safety performance
Use of cameras					
End-of-railcar signage					
Signal system safety					
Roadway worker protections					

 Completed
 Partially completed
 Not completed

Source: GAO analysis of FTA documentation and interviews of FTA officials, as of June 2021. | GAO-21-104029

Data table for Figure 5: Status of the Safety Risk Management (SRM) Process for Four Safety Issues under Review by Federal Transit Administration (FTA)

Federal Transit Administration (FTA) safety concerns	Identify safety concern	Assess safety risk	Develop mitigation measures	Implement mitigation measures	Monitor safety performance
Use of cameras	Completed	Completed	Completed	Completed	Completed
End of railcar signage	Completed	Partially completed	Partially completed	Not Completed	Not Completed
Signal system safety	Completed	Partially completed	Partially completed	Not Completed	Not Completed
Roadway worker protections	Completed	Completed	Partially completed	Not Completed	Not Completed

Source: GAO analysis of FTA documentation and interviews of FTA officials, as of June 2021. | GAO-21-104029

Cameras. According to a schedule provided by FTA, the agency began identifying the use of cameras on rail as a safety concern in June 2019. As part of its first step, FTA developed a Safety Concern Identification Report that pulled from different sources, including a review of recommended practices and procedures used in the field, to better understand how cameras are used and risks they may mitigate. For instance, FTA identified potential consequences if cameras were not required to be installed on rail transit, including the likelihood of repeat accidents if cameras were not used to determine the cause, or if a safety or rule violation by drivers was more likely to occur if cameras were not present. Based on this report, FTA’s Safety Assessment Team confirmed that it had developed the topic enough to move from the identification step to the risk assessment step.

FTA developed a safety risk assessment and mitigation management plan for the topic, which included issuing a safety bulletin, among other things. As shown in the documents FTA provided us, FTA followed and documented the steps as laid out in the SRM process for the camera concern. For instance, FTA performed an iterative safety risk assessment of the camera topic where FTA calculated the severity and likelihood of different scenarios and plotted these on the safety risk management matrix. FTA officials told us the Executive Safety Review Board subsequently used the safety risk management matrix to decide not to require cameras on rail given the assessed level of safety risk, the forecasted reduction of risk of the proposed requirement, and the rail transit industry’s adoption of cameras. FTA also used the safety risk assessment to develop a mitigation management plan that described the mitigation steps that it expected to take. For instance, FTA issued a safety bulletin that said rail transit agencies may consider installing cameras in the controlling locomotive cabs and cab car operating compartments. In addition to the safety bulletin, FTA held a webinar to

provide technical assistance on camera usage. FTA also collected additional information from SSOAs about the number of transit agencies that have already adopted or are likely to adopt cameras in the future and used the information to evaluate a risk assessment. FTA officials stated they intend to continue to monitor safety performance regarding the adoption of cameras.

Signage. In December 2019, in response to NTSB's recommendations to FTA to require rail transit agencies to post signs warning of potentially dangerous situations from moving between rail-transit cars, FTA notified NTSB that it planned to use its SRM process to assess this safety concern and determine mitigation measures. In March 2020, NTSB told FTA that it did not believe it was necessary to apply the SRM process to these recommendations, saying that doing it would delay needed action without any potential benefit. NTSB believed that to post visible and easily understood signs warning of potentially dangerous situations from moving between rail transit cars in motion and prevent fatalities was a fundamental, low-cost risk mitigation measure that did not require SRM analysis and urged FTA to initiate that requirement. FTA responded to NTSB that based on NTSB's March 2020 letter, it issued a December 2020 safety bulletin recommending that rail transit agencies follow APTA voluntary standards on emergency signage. NTSB responded that the safety bulletin does not fully address the issue and that NTSB is keeping the recommendation open. FTA officials agreed to consider the safety bulletin as an interim step as it continues to assess the risk and other potential mitigation measures.

Signals. In June 2020, FTA completed the process of identifying risks associated with signal system safety as part of the SRM process, after developing a safety concern identification report. However, FTA has yet to formally complete the risk assessment, or develop and implement mitigation measures as outlined in its schedule. NTSB previously issued two related recommendations regarding safety system signals. In 2009, NTSB recommended FTA advise agencies regarding collecting better rail data to include automatically generated alerts and speed restrictions on rail. This recommendation was subsequently closed as implemented. In 2015, NTSB recommended FTA require rail transit agencies to implement certain transmission-based control systems to help prevent train collisions. FTA stated it subsequently collected additional data regarding these systems and planned to evaluate existing research before requiring these additional technologies could be implemented. This recommendation is currently open. FTA's Safety Concern Identification report describes the risks from rail transit signal systems if not designed

or maintained properly, among other things. For instance, if not properly designed or maintained, signal systems might fail, allowing trains to move in violation of commands or train operators to fail to respond to signals.

Roadway Worker Protections. In mid-2019, FTA began to review roadway worker protections as part of the SRM process and, in March of that same year, TRACS began meeting to research the topic, including evaluating transit technology used to mitigate identified risks. In a September 2019 briefing delivered to FTA, TRACS included, among other things, a listing of industry practices, standards and technologies used to minimize risks to roadway workers. And in a final draft report delivered to FTA, TRACS outlined a set of recommendations including that FTA adopt the use of secondary warning systems and behavior-based safety systems. As of June 2021, FTA completed the risk identification and assessment steps as required by the SRM procedures for this safety concern. According to FTA officials, they are still developing the mitigation management plan for roadway worker protections and, as of June 2021, continue to develop the mitigation management plan. The officials said that, as part of the mitigation management plan, FTA plans to solicit comments to inform the development of a possible mitigation, including potential rulemaking.

FTA Has Not Completed Its Identification and Implementation of Lessons Learned from Its Pilot as It Prepares for Future Rounds of the SRM

FTA has not completed a key step necessary to improve the SRM process after the initial round—identifying, documenting, and implementing lessons learned from its camera pilot project. While FTA developed goals and objectives it hoped to learn from the camera pilot project, as discussed above, it has not completed the assessment of the pilot's performance or used the information to address issues with the SRM process. FTA officials told us that they have identified at least one lesson that will be implemented and plan to identify additional lessons. Nevertheless, FTA has not completed that effort to date though it has been more than 6 months since the end of the pilot, and FTA is currently identifying the next round of safety concerns.³⁰ FTA stated it had not fully developed the lessons learned from the first round of the SRM process because reviewing the safety concerns took longer than anticipated. For

³⁰ In July 2021, FTA published a request for information in the federal register to help identify potential safety concerns from the public, including the transit industry.

instance, FTA did not accurately estimate how much data it would need to collect to address each of the safety concerns. In addition, FTA faced challenges collecting data and performing outreach as a result of the COVID-19 pandemic.³¹

Fully evaluating pilot project performance can be a valuable way of improving agency processes. We have previously reported that evaluating project performance and identifying and documenting lessons learned are leading practices for pilot projects.³² For other parts of its SMS framework, FTA has recognized the importance of applying lessons learned. In particular, FTA effectively developed a comprehensive list of lessons learned for other SMS-related efforts during the rollout of its SMS framework and successfully implemented those lessons to improve its processes. Additionally, FTA identified lessons learned as it reviewed submitted agency safety plans and produced a lessons learned document to share with agencies to improve how plans were developed and submitted. By not developing and documenting lessons learned—especially at the end of each step of the project—and how the agency plans to incorporate these lessons into the SRM process—FTA may miss opportunities to improve the timeliness and effectiveness of a relatively new SRM process that is essential to implementing SMS. Applying lessons learned from its SRM process will be key to FTA's success in identifying and mitigating safety risks across the entire transit industry.

FTA Has Not Yet Determined Whether Mandatory Safety Standards Are Needed, and

³¹ According to FTA officials, they learned that a comprehensive SRM cycle can take several years. As a result, FTA officials told us that FTA's next cycle will have a multi-year schedule and will include identified rail and bus transit safety concerns to be assessed. FTA has yet to update its standard operating procedures based on this lesson.

³² GAO, *U.S. Postal Service: Addressing Policy Gaps Could Improve Pilot Design and Evaluation for Postal Innovations*, [GAO-19-293](#) (Washington, D.C.: March 14, 2019).

Stakeholders Have Varied Views on Such Standards

FTA Has Encouraged Transit Agencies to Adopt Voluntary Standards in the Near Term and May Develop Mandatory Standards in the Future

FTA has consistently encouraged transit agencies to adopt voluntary, industry-developed minimum safety standards, while also suggesting that it will likely develop some mandatory federal standards through future rulemaking. In response to the statutory requirement for FTA to include in its national public transportation safety plan both “minimum safety performance standards for public transportation vehicles used in revenue operations” and “minimum safety standards to ensure the safe operation of public transportation systems,”³³ FTA included a handful of industry-developed voluntary safety standards—all relating to rail transit.³⁴ In its 2017 Safety Plan, FTA “strongly encouraged” transit agencies to adopt these standards but also noted that the agency would be “segue[ing] towards the implementation of mandatory requirements through the [f]ederal rulemaking process[.]”³⁵ In the preamble to its 2018 Public Transportation Agency Safety Plan final rule, FTA reiterated its encouragement for transit agencies to adopt the voluntary minimum safety performance standards established in the national public-transportation safety plan “until mandatory standards are established, in

³³ 49 U.S.C. § 5329(b)(2)(C), (D).

³⁴ With respect to safety performance standards for vehicles used in revenue operations, FTA identified safety standards for consideration when procuring heavy and light rail vehicles that address vehicle crashworthiness, fire-life safety, vehicle data recorders, emergency lighting, and emergency signage. FTA stated that these standards reflect existing best practices and effectively address several NTSB recommendations—considerations FTA was required to consider by the FAST Act. With respect to standards for safe operations, FTA identified five standards for rail transit operators and employees’ use of electronic devices; rail roadway worker protections; rail work zone safety; requirements for contractors working on or near a rail transit system; and minimum operating rules for transit systems that operate light and heavy rail systems.

³⁵ The rulemaking process is used by federal agencies to develop and issue regulations typically involves publishing proposed and final rules in the *Federal Register*, seeking public comment, and including a preamble accompanying a final rule that, among other things, states why the rule is necessary.

which case each transit agency must fully comply with those safety performance standards.”³⁶

In addition to possible mandatory federal safety standards for roadway worker protection, FTA has stated that standards would also be forthcoming for assaults on transit operators. However, FTA ultimately chose to rely on transit agencies’ implementation of SMS to address the safety risk. More specifically, FTA was required by the FAST Act to issue a notice of proposed rulemaking on protecting public transportation operators from the risk of assault.³⁷ FTA also received a public comment during its Notice of Proposed Rulemaking for its new agency safety plan rule that encouraged FTA to incorporate occupational health issues—focusing on transit driver assault, restroom breaks, and fatigue management—into its 2018 agency safety plan rule. In response, FTA stated that to the extent occupational health issues may present safety risks to a transit agency, that agency should address those risks through the SMS process. FTA’s response to this comment also stated that FTA “will issue rules regarding operator assault in the future.”³⁸ In May 2019, FTA concluded that because the agency safety plan rule requires transit agencies to assess the risk of operator assault and other risks to transit operator safety under SMS, a separate notice of proposed rulemaking on this subject was unnecessary.³⁹ FTA’s ultimate decision to place the responsibility on transit agencies to identify risk mitigations or strategies for operator assaults did not align with one of TRACS recommendations

³⁶ 83 *Fed. Reg.* 34418, 34432 (July 19, 2018).

³⁷ Pub. L. No. 114-94, § 3022, 129 Stat. 1312, 1493 (2015). Per the FAST Act, FTA was to issue the notice of proposed rulemaking no later than March 2017.

³⁸ 83 *Fed. Reg.* 34418, 34452 (July 19, 2018).

³⁹ 84 *Fed. Reg.* 24196 (May 24, 2019). By contrast, FTA issued a final rule in August 1, 2016 in response to MAP-21’s requirement that it establish by rule minimum performance standards, a standardized scoring system, and a pass-fail threshold that will better inform local transit agencies as they evaluate and purchase buses. 49 U.S.C. 53318(e). The rule requires buses procured with FTA funds to pass a test to meet minimum thresholds for structural integrity, safety, maintainability, reliability, fuel economy, emissions, noise, and performance.

for FTA to develop minimum design standards to ensure operator safety.⁴⁰

Accordingly, it remains to be seen which safety risk areas FTA will determine are sufficiently addressed by existing standards and oversight practices or necessitate the development of federal mandatory standards. In particular, further progress in the standards area appears to rely in substantial part on FTA's progress in addressing identified data issues and the successful implementation of SMS.⁴¹ FTA has noted that, consistent with SMS, it "intends to prioritize its standards development, rulemaking, enforcement, oversight, and resources toward those issues that are identified, through the analysis of data, as posing the greatest risk to the safety of public transportation systems." Additionally, FTA uses its triennial audits of SSOAs to ensure that states are effectively carrying out their oversight responsibilities, including identifying and mitigating safety risks at their rail transit agencies. FTA also uses triennial audits of SSOAs to ensure that states are effectively carrying out their oversight responsibilities and to assess nationwide trends and identify safety risks. The information from these reviews will therefore serve as an important input into FTA's SRM process, including decisions about mitigation efforts such as new mandatory federal safety standards.

Stakeholders Recognize Both the Benefits and Challenges of Mandatory Federal Safety Standards

Nearly all of the transit agencies and SSOAs we spoke with—17 of 21—said that it could be beneficial for the transit industry to have some mandatory federal safety standards, but they cautioned that there are conditions to consider. Two transit agencies, however, explicitly said that FTA should not mandate any transit safety standards, while a third

⁴⁰ FTA tasked TRACS with developing recommendations on the elements for a SMS approach to preventing and mitigating transit worker assaults. TRACS's July 6, 2015, report also recommended FTA take a number of other steps, including developing and publicizing best practice risk control strategies, providing training to safety-sensitive employees about how to de-escalate potentially violent situations, and conducting further research into certain areas. FTA has taken steps to implement some of these recommendations. However, TRACS made these recommendations 3 years before FTA issued its 2018 rule requiring transit agencies implement SMS.

⁴¹ In its 2017 report, FTA expressly linked its data analysis and SMS to determining the efficacy of existing standards and protocols. See *FTA 2017 Review and Evaluation of Public Transportation Safety Standards*.

preferred voluntary consensus standards supported by FTA.⁴² A potential benefit specifically mentioned by an SSOA was increasing passengers' confidence in transit safety by offering a consistent level of safety across transit systems. Another potential benefit, as noted by another SSOA was that to the extent mandatory federal safety standards were applied across various transit modes, it could increase the pool of operators and staff nationwide, as they could more easily move between modes and agencies. An official from one smaller system said that mandatory federal safety standards could also help transit agencies better prioritize their funding needs.

While recognizing potential benefits, transit agencies and SSOAs we spoke with also pointed to reasons why developing mandatory federal safety standards could be challenging. The primary challenge cited was that the diverse nature of transit systems would make federal standards arduous for transit agencies to implement. This diversity across the industry includes different modes, technologies and assets, and operations in different environments with variable weather conditions, systems' ages, and other factors that can make it difficult to craft standards appropriate for all transit agencies. One transit agency we spoke with noted that performance-based standards would provide agencies greater flexibility than prescriptive-based standards, and therefore make it easier to implement standards across the industry.

The potential difficulty in reconciling newly developed mandatory federal safety standards with existing regulatory and voluntary safety standards could be another challenge, as transit agencies tend to adopt voluntary industry safety standards that are applicable to their systems. An SSOA official noted that his state already has regulations and is in the process of developing additional standards that apply to transit safety, such as state requirements on vehicles, hours of services, and operator certification. He said that it would be a challenge to reconcile his state safety standards and any mandatory federal safety standards, especially if the federal standards pre-empt state standards, which could be more stringent than the federal standards. APTA officials we spoke with also emphasized the importance of transit agencies having the flexibility to address safety risks and suggested that mandatory federal safety standards could constrain the industry from adopting the latest safety solutions.

⁴² One transit agency provided no perspective on this.

Seven of the 17 transit agencies and SSOAs expressed concerns about the anticipated costs associated with meeting newly developed mandatory federal safety standards. One transit agency was concerned that FTA safety mandates would be unfunded mandates, something the transit agency could not support. Officials from two SSOAs mentioned how FRA would issue safety mandates for its railroads but not provide commensurate funding. However, one SSOA official further noted that FRA is a regulatory agency overseeing railroads that are generally private businesses.

Transit agency and SSOAs we spoke with suggested that the benefits and challenges of establishing federal mandatory standards would play out differently depending on the specific safety area at issue. More specifically, when we asked officials to comment on the feasibility and need for minimum federal standards with respect to specific safety areas, they offered notably different views depending on the safety area. As discussed below, transit agency and SSOA officials most favored the establishment of federal minimum personnel or “human factor” standards for transit employees who perform critical safety functions. Similarly, this area was among the top areas identified in FTA’s agency safety-plan rulemaking period as warranting the development of federal standards. By contrast, federal minimum standards relating to transit equipment and assets were viewed by stakeholders we interviewed as far more challenging, if not impossible in some instances, to establish.

Standards regulating human factors. Transit agencies and SSOAs we spoke with, as well as NTSB, overwhelmingly said that if FTA were to establish mandatory standards, those pertaining to employees who perform safety critical transit functions would be beneficial.⁴³ As one official noted, unlike the variation present in physical transit assets, all employees who perform safety critical functions within transit are subject to risks associated with fatigue, medical incapacitation, and other issues that can jeopardize safety. Federal standards that help mitigate the fatigue and other human-factor safety risks already exist for airlines, railroads, and interstate trucking. Over the years, NTSB has recommended, among other things, that FTA develop regulations to ensure that transit agencies develop scheduling programs to manage

⁴³ In seeking public comment on its compendium of transit safety standards and protocols, FTA identified six sub-categories of personnel or human factor standards: Hours of Service Standards, Workplace/Worker Safety, Qualifications and Certifications of Operators and Engineers, Medical Examination Certification, Drug and Alcohol Testing, and Training and Certifications. 81 *Fed. Reg.* 30605, 30606 (May 17, 2016).

personnel's fatigue risks and identify sleep disorders. APTA officials said a discussion is warranted on national standards to limit hours of service and to address health issues such as sleep disorders, two areas identified by some of their members. Viewpoints on setting specific human factors standards include the following:

Medical fitness for duty. Requiring medical examinations of employees, according to eight transit agencies we spoke with, would be beneficial and could help to pre-emptively identify serious but manageable health issues, such as sleep disorders. Several states, including California, Massachusetts, and Oregon have medical fitness transit operator requirements that apply to their states' transit bus operators, similar to FMCSA's requirements for interstate commercial drivers.

Hours of service. Setting standards to better schedule shift work, including overnight tours of duty and personnel rotations, could ensure maximum alertness and minimize fatigue. Other federal modal administrations already have various hours of service requirements (e.g., FAA, FMCSA, and FRA⁴⁴). Some stakeholders, however, cautioned that, given the uniqueness of every transit system, an hours-of-service standard could result in additional operating costs, staffing shortages, or pushback from transit labor unions, as service hours can vary greatly depending on the transit system and its needs.

Equipment and assets. Because of the wide variation in the types of rail and bus vehicles, among other transit assets, fewer transit agencies and SSOAs we spoke with were in favor of mandatory federal safety standards affecting equipment and assets, stating that they could be challenging or impossible. However, as long as the standards are not too prescriptive and—depending on the age and type of assets and the proposed standard—permit waivers, some stakeholders said mandatory federal safety standards could be feasible. Standards that could be viable included those pertaining to rail signals and communication systems; event data recorders (including cameras and audio recorders), or vehicle crashworthiness. Transit officials noted that many transit agencies were already installing cameras and audio recorders and communication systems in their systems. FTA has stated its willingness to adopt flexible standards in this area. In FTA's *National Public Transportation Safety Plan*, for example, FTA stated that "it is committed to working with public transportation officials to develop rules ensuring that all public

⁴⁴ See e.g., 14 C.F.R. §§ 91.1059, 91.1061; 76 *Fed. Reg.* 81134 (Dec. 27, 2011); 49 U.S.C. Chapter 211; 49 C.F.R. Part 228.6

transportation agencies, regardless of size, may confidently procure assets that are safe and improve the safety potential of the public transportation industry.”

Conclusions

Over the last 8 years, FTA has assumed a larger role in ensuring transit systems operate safely, and undertaken a significant amount of effort to build a substantial safety oversight regime. With the adoption of the SMS approach to safety oversight, FTA has joined its sister agencies in DOT in applying rigorous processes to identify, assess and mitigate safety risks. Under SMS, FTA has instituted a formalized, risk-based, data-driven approach evaluating transit agency safety risks. This strategy is a fundamental change to FTA’s safety oversight and, as a result, the agency will need to understand what processes continue to work well and others that may not as it begins to implement improvements across transit. A key way of identifying potential improvements is through a pilot project, which FTA has conducted for the cameras safety concern. While FTA said that it plans to develop lessons learned from this pilot, which ended in December 2020, it has yet to do so. Given the complexities of safety concerns, it behooves FTA to determine what lessons came out of the camera pilot and the other safety concerns that were addressed in the first SRM cycle before identifying and addressing new safety concerns in another cycle. Understanding what aspects of the SRM process worked well and what could be improved would likely make the SRM process for other safety concerns more effective, and therefore better at mitigating transit safety issues.

Recommendations

We are making the following recommendation to FTA:

- The Administrator of FTA should take steps to identify and document lessons learned from the camera safety concern pilot project, including a plan for implementing those lessons in the SRM process.

Agency Comments

We provided a draft of this report to DOT for review and comment. In its comments, reproduced in appendix I, DOT concurred with our

recommendation to take steps to identify and document lessons learned from its camera safety concern pilot project. DOT also provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the appropriate congressional committees, DOT, and other interested parties. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have questions concerning this report, please contact me at (202) 512-2834, or vonaha@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix II.

A handwritten signature in black ink, appearing to read 'Andrew Von Ah', with a stylized, flowing script.

Andrew Von Ah
Director, Physical Infrastructure Issues

Appendix I: Comments from the Department of Transportation



U.S. Department of
Transportation

Office of the Secretary
of Transportation

August 31, 2021

Mr. Andrew Von Ah
Director of Physical Infrastructure Issues
U.S. Government Accountability Office (GAO)
441 G. Street NW
Washington, DC 20548

Assistant Secretary
for Administration

1200 New Jersey Ave., SE
Washington, DC 20590

Dear Mr. Von Ah

Safety is the highest priority of the Federal Transit Administration's (FTA). FTA administers the National Public Transportation Safety Program (Safety Program) to ensure the safety of the Nation's transit systems. FTA adopted the principles and methods of Safety Management Systems as the foundation of this Safety Program to proactively address safety risks for over 700 transit agencies across the Nation. As of August 10, 2021, one hundred percent of transit agencies have safety plans to help keep riders and employees safe on their transit systems.

Since 2016, FTA has taken the following actions to implement the Safety Program:

- Issued the State Safety Oversight regulation in 2016;
- Published the National Public Transportation Safety Plan in 2017;
- Issued the Public Transportation Safety Certification Training Program regulation in 2018;
- Issued the Public Transportation Agency Safety Plan regulation in 2018;
- Administered the Transit Advisory Committee for Safety, which provides advice and recommendations to the FTA Administrator regarding transit safety issues;
- Implemented a pilot of the Safety Risk Management (SRM) process in 2019 to assess and address safety concerns impacting the transit industry; and
- Published a Federal Register notice on July 15, 2021, to solicit input from the public regarding information and data to identify transit safety concerns that FTA should evaluate through its SRM process for potential action.

We concur with GAO's recommendation to take steps to identify and document lessons learned from the camera safety concern pilot project, including a plan for implementing those lessons in the SRM process. FTA recognizes the importance of continually improving the SRM standard operating procedure to better meet the agency and transit industry's needs and align FTA's procedures with industry best practices. We will provide a detailed response to the recommendation within 180 days of the final report's issuance.

We appreciate the opportunity to respond to the GAO draft report. For additional information or assistance, please contact Madeline M. Chulumovich, Director, Audit Relations and Program Improvement, at (202) 366-6512.

Sincerely,

Philip A. McNamara
Assistant Secretary for Administration

Text of Appendix I: Comments from the Department of Transportation

Mr. Andrew Von Ah

Director of Physical Infrastructure Issues

U.S. Government Accountability Office (GAO) 441 G. Street NW

Washington, DC 20548

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Sincerely,

Philip A. McNamara

Assistant Secretary for Administration

Appendix II: GAO Contact and Staff Acknowledgments

GAO Contact

Andrew Von Ah, (202) 512-2834 or vonaha@gao.gov

Staff Acknowledgments

In addition to the individual named above, Kyle Browning (Assistant Director), Martha Chow (Analyst-in-Charge), Antoine Clark, Geoffrey Hamilton, Delwen Jones, Josh Ormond, Joshua Parr, Laurel Voloder, Todd Schartung, and Elizabeth Wood made key contributions to this report.

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