Federal Transit Administration

Risk-Based Inspection Program Toolkit

49 U.S.C. § 5329(k)

01-08-2024

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Note: Originally published on October 21, 2022, FTA updated this Risk-Based Inspection Program Toolkit with the following changes on January 8, 2024. FTA replaced the word "incident" with "event" on pages 12, 14, 16, 21, and 26, and in the definition of "Inspection Data" on page 2. As you'll see from the definitions of "event" and "incident" on page 2, an incident is one type of event.

Acronyms and Definitions

Terms and Acronyms	Definition
Accident	An Event that involves any of the following: A loss of life; a report of a serious injury to a person; a collision involving a rail transit vehicle; 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.
Audit	A review or analysis of records and related materials, including, but not limited to, those related to financial accounts.
Corrective Action Plan (CAP)	A plan developed by a Rail Transit Agency (RTA) that describes the actions the RTA will take to minimize, control, correct, or eliminate risks and hazards, and the schedule for taking those actions. Either a State Safety Oversight Agency or FTA may require an RTA to develop and carry out a Corrective Action Plan.
CFR	Code of Federal Regulations
Consultation	The process of seeking, discussing, and considering the views of other participants, and, where feasible, seeking agreement with them regarding matters.
Event	An Accident, Incident, or Occurrence.
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
Hazard	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 rail fixed guideway public transportation system; or damage to the environment.
Incident	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 rail transit agency.
Inspection	A physical observation of equipment, facilities, rolling stock, operations, or records for the purpose of gathering or analyzing facts or information.
Inspection Data	Data that includes, but is not limited to, inspection records and report forms, records of failures and defects with severity, records of speed restrictions, including the reason for applying, event and safety risk mitigation verification, adherence to inspection schedules, including reports/documentation of inspections not performed, and capital project schedules and progress.
Investigation	The process of determining the causal and contributing factors of an accident, incident, or hazard, for the purpose of preventing recurrence and mitigating risk.

Terms and Acronyms	Definition
NTD	National Transit Database
Maintenance Data	Data that includes, but is not limited to, major maintenance activity schedule and progress, adherence to maintenance schedules, including reports/documentation of deferred maintenance, records of failures and defects with severity if applicable, and records of revenue vehicles out of service, including causal information.
Public Transportation Agency Safety Plan (PTASP)	The comprehensive Agency Safety Plan for a transit agency, including a Rail Transit Agency, that is required by 49 U.S.C. § 5329(d) and based on a Safety Management System.
Public Transportation Safety Certification Training Program (PTSCTP)	The certification training program for Federal and State employees or other designated personnel who conduct safety audits and examinations of public transportation systems. Employees of public transportation agencies directly responsible for safety oversight are also required to complete the PTSCTP.
Risk	The composite of predicted severity and likelihood of the potential effect of a hazard.
Rail Fixed Guideway Public Transportation System (RFGPTS)	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. RFGPTSs include, but are not limited to, rapid rail, heavy rail, light rail, monorail, trolley, inclined plane, funicular, and automated guideway.
Rail Transit Agency (RTA)	Any entity that provides services on a rail fixed guideway public transportation system.
Risk-Based Inspection	An inspection conducted as part of a risk-based inspection program.
Risk-Based Inspection Data Management System	A physical or digital system that follows administrative policies and procedures that identify data storage, organizational, and management processes for risk-based inspections.
Risk-Based Inspection Program	A risk-based inspection program uses qualitative and quantitative data analysis to inform ongoing inspection activities. Risk-based inspection programs are designed to prioritize inspections to address safety concerns and hazards associated with the highest levels of safety risk.
Risk Mitigation	A method or methods to eliminate or reduce the effects of hazards.
Safety Assurance	The processes 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.

Terms and Acronyms	Definition
Safety Management System (SMS)	The formal, top-down, 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 Program Data	Data that includes, but is not limited to, event data, hazard data, safety risk ratings, mitigation data, CAP data, near miss data, and ongoing monitoring data.
Safety Risk Assessment	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 (SRM)	A process within a rail transit agency's Public Transportation Agency Safety Plan for identifying hazards and analyzing, assessing, and mitigating safety risk.
State Safety Oversight Agency (SSOA)	An agency established by a State that meets the requirements and performs the functions specified by 49 U.S.C. 5329(e) and the regulations set forth in 49 CFR Part 674.
State	A State of the United States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, Guam, American Samoa, and the Virgin Islands.
TTP	Technical Training Plan
U.S.C.	United States Code
Vehicle	Rolling stock used on a rail fixed guideway public transportation system, including, but not limited to, passenger and maintenance vehicles.

Purpose

The Risk-Based Inspection Toolkit is provided as a reference tool for State Safety Oversight Agencies (SSOAs) to assist with the development and implementation of risk-based inspection programs. This toolkit is a guide to help SSOAs address the necessary components of risk-based inspection programs. SSOAs are not required to use the toolkit; however, SSOAs are responsible for ensuring their risk-based inspection programs meet the requirements of the Special Directive on Risk-Based Inspections (Special Directive) issued to each SSOA on October 21, 2022, as required by 49 U.S.C. §5329(k)(5).

To build this document, the Federal Transit Administration (FTA) reviewed inspection practices and lessons learned from SSOAs with elements of risk-based inspection programs in place. In addition, FTA reviewed the risk-based inspection programs established by other Federal agencies, including the Federal Railroad Administration (FRA) and the Environmental Protection Agency, as well as for other industries, such as the program developed by the American Petroleum Institute.

Background

On November 15, 2021, President Biden signed the Bipartisan Infrastructure Law, enacted as the Infrastructure Investment and Jobs Act, which continues the public transportation safety program. The Bipartisan Infrastructure Law amended 49 U.S.C § 5329 to require SSOAs to conduct risk-based inspections of the rail fixed guideway public transportation systems (RFGPTS) that the SSOA oversees. The Bipartisan Infrastructure Law also added a provision directing FTA to issue a Special Directive to each SSOA on the development and implementation of risk-based inspection programs (see 49 U.S.C. § 5329(k)(5)).

FTA plays a critical role in ensuring the effectiveness and adequacy of the SSOA programs. The Bipartisan Infrastructure Law requires FTA to assess each SSOA's capability to conduct inspections and ensure that the SSOA's inspection practices are commensurate with the number, size, and complexity of the RFGPTS that the SSOA oversees; the SSOA's inspection program is risk-based; and the SSOA has sufficient resources to conduct the inspections.

Risk-Based Inspection Programs

A risk-based inspection program uses qualitative and quantitative data analysis to inform ongoing inspection activities. Risk-based inspection programs are designed to prioritize inspections to address safety concerns and hazards associated with the highest levels of safety risk.

As described in 49 U.S.C. § 5329(k), each SSOA must develop policies and procedures for inspection access and data collection in consultation with each rail transit agency that the SSOA oversees. The policies and procedures must address SSOA authority and capability to enter and conduct inspections of the RFGPTS, including access for inspections that occur with and without advance notice. Additionally, the policies and procedures must address how the SSOA will collect data from each rail transit agency to support its risk-based inspection monitoring and prioritization activities, including data that the rail fixed guideway public transportation agency collects when

identifying and evaluating safety risk. Risk-based inspection programs must be implemented in a way that is commensurate with the size and complexity of each RFGPTS that the SSOA oversees.

These policies and procedures must be incorporated into the SSOA Program Standard, required by the State Safety Oversight regulation at 49 CFR Part 674, and the rail transit agency's Agency Safety Plan, required by the Public Transportation Agency Safety Plan regulation at 49 CFR Part 673.

Timeline for Program Implementation

Section 30012(b) of the Bipartisan Infrastructure Law provides SSOAs with two years from the date of the Special Directive's issuance to develop and implement a risk-based inspection program.

Funding

The Bipartisan Infrastructure Law included increased funding for SSOAs from 0.5 percent to 0.75 percent of amounts available for urbanized area formula grants (49 U.S.C. § 5307). Congress did not specifically appropriate funds within the Bipartisan Infrastructure Law for risk-based inspection programs. However, with the increase in federal grant funds, SSOAs are expected to create risk-based inspection programs commensurate with the number, size, and complexity of the RFGPTS they oversee.

Verifying Compliance

As required by the Special Directive, SSOAs must submit risk-based inspection program documentation to FTA. FTA will assess each SSOA's risk-based inspection program development and implementation in two stages. In accordance with 49 U.S.C. § 5329 and 49 CFR Part 670, FTA directs each SSOA to:

(1) submit documentation that demonstrates the SSOA has developed a risk-based inspection program in accordance with the Special Directive and the criteria defined in U.S.C. § 5329(k) within two years of the issuance of the directive, and

(2) within one year of FTA's approval of the SSOA's risk-based inspection program, submit documentation that demonstrates the SSOA has implemented that approved program for at least six months.

The risk-based inspection program development and implementation documentation should be submitted in accordance with the Special Directive requirements. The Special Directive requires submittal of comprehensive and complete documentation to support the SSOA's conformance with each requirement of risk-based inspections.

FTA will review each package as it is received and may contact the SSOA for additional details or clarifications. Upon submission, FTA will perform an initial review of the package for completeness to ensure all required elements are addressed and referenced documents are included. Due to the interconnectivity of program elements, some SSOAs may need to reference the same

documentation multiple times. The SSOA does not to need to submit duplicate documentation; instead, the SSOA should identify in their submittal which documents apply to multiple areas of their risk-based inspection program. In these instances, the SSOA should provide a clear, concise citation to direct the FTA's review to the appropriate locations(s) within the submitted documentation.

After an SSOA submits a complete package, FTA will review the package and accompanying documentation by category. FTA may contact the SSOA during this time for clarification or follow-up questions. FTA may also conduct field visits or verification activities at the SSOA or their RFGPTS. Once all questions and concerns are resolved, FTA will issue a letter of approval to the SSOA to verify the development of its risk-based inspection program. After an SSOA has received an approval of its program development, the SSOA will begin implementing their program according to the approved policies and procedures documented in the Program Standard. After the SSOA has been implementing a risk-based inspection program for at least six months, the SSOA will submit documentation to FTA that will verify successful implementation of the program. FTA will perform an assessment of the SSOA's risk-based inspection program through document review or onsite visits. Once FTA has verified the SSOA's implementation of the risk-based inspection program, FTA will process closure of the Special Directive.

FTA may require revisions of either set of submissions before approving the development or implementation of the SSOA's risk-based inspection program. If FTA cannot verify either the development or implementation of an SSOA's risk-based inspection program, FTA will provide written explanation regarding the specific issues, concerns, or deficiencies in the SSOA's program. FTA will also provide the SSOA with an opportunity to correct its program and to resolve the issues, concerns, or deficiencies.

To ensure adequate time for SSOAs to receive approval of their risk-based inspection programs, each SSOA should submit its risk-based inspection program development documentation within 18 months of Special Directive issuance to ensure that the program is approved prior the deadline, which is two years from the date that FTA issues the Special Directive to the SSOA. FTA will monitor each SSOA's progress in developing and implementing its risk-based inspection program including conducting progress meetings with each SSOA as needed.

Toolkit Organization

The Risk-Based Inspection Toolkit is organized into six categories of risk-based inspection program requirements:

- Category 1: Authority to Perform Risk-Based Inspections
- Category 2: Risk-Based Inspection Policies and Procedures
- Category 3: Data Sources and Collection
- Category 4: Inspection Prioritization

- Category 5: Risk-Based Inspection Programs Are Commensurate with Number, Size, and Complexity of the RFGPTS
- Category 6: SSO Staffing, Qualifications, and Training

Category 1: Authority to Perform Risk-Based Inspections

a) Inspection Authority

49 U.S.C. § 5329(k)(1)(A)
A State safety oversight program shall provide the State safety oversight agency established by the program with the authority and capability to enter the facilities of each rail fixed guideway public transportation system that the State safety oversight agency oversees to inspect infrastructure, equipment, records, personnel, and data, including the data that the rail fixed guideway public transportation agency collects when identifying and evaluating safety risks.

49 U.S.C. § 5329(k)(1)(B)
A State safety oversight agency, in consultation with each rail fixed guideway public transportation agency that the State safety oversight agency oversees, shall establish policies and procedures regarding the access of the State safety oversight agency to conduct inspections of the rail fixed guideway public transportation system, including access for inspections that occur without advance notice to the rail fixed guideway public transportation agency.

SSOAs must have, and be able to demonstrate, the authority to access each of the RFGPTS they oversee to conduct risk-based inspections, with and without advanced notice to the RTA.

The SSOA's Program Standard should clearly define the scope of SSOA access to each RFGPTS. A robust risk-based inspection program requires that SSOAs have authority to access and inspect the full spectrum of activities at each RFGPTS. At a minimum, SSOAs must have explicit authority to access the RFGPTS to inspect:

- Infrastructure
- Equipment
- Records
- Personnel
- Data

Required Submissions

1. Submit Program Standard and relevant documentation that demonstrate the SSOA has the authority and capability to enter the facilities of each RTA that the SSOA oversees.

2. Submit Program Standard and relevant documentation that demonstrate the SSOA has the authority and capability to inspect RTA activities, including infrastructure, equipment, records, personnel, and data.

3. Submit Program Standard and relevant documentation that demonstrate the SSOA has the authority to conduct inspections with and without advance notice.

Category 2: Risk-Based Inspection Policies and Procedures

a) Access Policies and Procedures

49 U.S.C. § 5329(k)(1)(B)
A State safety oversight agency, in consultation with each rail fixed guideway public transportation agency that the State safety oversight agency oversees, shall establish policies and procedures regarding the access of the State safety oversight agency to conduct inspections of the rail fixed guideway public transportation system, including access for inspections that occur without advance notice to the rail fixed guideway public transportation agency.

49 U.S.C. § 5329(k)(3)
Policies and procedures [for risk-based inspections] shall be incorporated into—

(A) the State safety oversight program standard adopted by a State safety oversight agency under 674.27 of title 49, Code of Federal Regulations (or any successor regulation); and

(B) the public transportation agency safety plan established by a rail fixed guideway public transportation agency under subsection (d).

The SSOA, in consultation with each RTA in its jurisdiction, must establish policies and procedures describing the SSOA's access to the RFGPTS to conduct inspections. These policies and procedures should include detailed descriptions of the processes the SSOA will use to conduct inspections of any RFGPTS both with and without advance notice. The SSOA may choose to develop policies and procedures tailored to each RFGPTS in its jurisdiction, or to develop overarching policies and procedures for multiple RFGPTSs if that is more practical. The policies and procedures should address:

- Notifications to the RTA to conduct inspections with and without notice
- Access procedures and escorts
- Access for all inspection areas
- Verification of certifications and trainings of SSOA inspectors to ensure their compliance with RTA safety protocols and requirements

These policies and procedures must be documented in the Program Standard and each RTA's Agency Safety Plan.

Required Submissions

1. Submit SSOA Program Standard and citation of Agency Safety Plan language for each RTA that the SSOA oversees that demonstrate comprehensive policies and procedures that address SSOA access to each rail fixed guideway public transportation system for risk-based inspections, both with and without notice. These policies and procedures must be developed in consultation with each rail transit agency the SSOA oversees

b) Inspection Practices Policies and Procedures

49 U.S.C. § 5329(k)(3)
Policies and procedures [for risk-based inspections] shall be incorporated into—

(A) the State safety oversight program standard adopted by a State safety oversight agency under 674.27 of title 49, Code of Federal Regulations (or any successor regulation); and

(B) the public transportation agency safety plan established by a rail fixed guideway public transportation agency under subsection (d).

The SSOA must establish policies and procedures that describe how inspections will be conducted. Clear descriptions of procedures that are understood by both the RTA and the SSOA will facilitate more effective and efficient inspections. The SSOA may choose to develop policies and procedures tailored to each RFGPTS in its jurisdiction, or to develop overarching policies and procedures for multiple RFGPTS if that is more practical. These policies and procedures should be documented in the Program Standard and shared with each RFGPTS.

The inspection policies and procedures must address the following:

- **Scheduling Inspections** – Describe how the SSOA schedules inspections, both with and without prior notice.
    - The policies and procedures should identify the SSOA employee responsible for scheduling inspections and who at the RTA should be notified prior to arrival. The policies and procedures should also establish a standard process and timeline for requesting access to the RFGPTS for inspections both with and without notice. The SSOA may establish a regular schedule for specific inspections, such as bimonthly track inspections or biweekly vehicle maintenance inspections. Similarly, the SSOA could establish non-regular schedules for inspections as necessary.
- **Inspection Reports** – Describe the report the SSOA will issue to the RTA after inspection activities.
    - The inspection report should use objective language and reference objective data, including measurements and photographs to document any issues noted during an inspection. Along with the deficiencies and remedial actions, the inspection report could include a section to note concerns that may not be explicitly covered under existing procedures, practices, or inspection forms. The policies and procedures should address whether the inspection report will be an aggregate report that combines several inspection activities, such as all inspections that occurred on a single day, or if the SSOA will issue a report for each inspection. The policies and procedures should outline who at the SSOA may issue an inspection report and the timeline for issuing a report after an inspection.

- **Immediate Safety Concerns** – Describe the actions to be taken if an immediate safety concern is identified during an inspection.

    - The policies and procedures should establish thresholds for an immediate safety concern, protocols for immediate notification to the RTA, and any other actions the inspector should take. At a minimum, the procedure should describe the actions the inspector must take to ensure their safety while reporting the immediate safety concern. The procedure should also include the process for notifying the RTA. The SSOA may develop these policies and procedures with the assistance of the RTA to leverage their existing processes for handling immediate safety concerns. The SSOA may include other items in the inspection procedure, such as a list of required personal protective equipment, or defects that require immediate notification to the RTA and SSOA.

- **Inspections of Equipment, Infrastructure, & Practices Specific to Each RFGPTS** – Describe the equipment, infrastructure, and practices to be inspected.

    - The SSOA should define the equipment, infrastructure, and practices specific to each RFGPTS that will be inspected. The policies and procedures should define the areas of inspection broadly and specifically. For example, the policies and procedures may specify vehicles inspections are required (broad) and then may define inspection frequencies and elements specific to vehicle types based on risk profiles (specific). If SSOAs have multiple RFGPTS in their jurisdiction, policies and procedures for inspections could apply to all RFGPTS for items like vehicles and maintenance facilities if that is practical. However, not all RFGPTS share all elements. For instance, not all systems have overhead catenary or a third rail. The policies and procedures should address inspection areas of each RFGPTS consistent with the system's elements.

- **Event Verification** – Describe how inspections verify the RTA confirms the successful repair of an event scene.

    - The policies and procedures should address the inspection of areas with similar characteristics to those where an event occurred. Post-event repair inspections verify that the RFGPTS successfully repaired the event scene. Beyond confirming the repairs, the policies and procedures should include how the SSOA will assess whether the RTA is leveraging data and information collected through investigation activity to determine probable cause and to support the identification of hazards.

- **Ongoing Monitoring** – Describe the ongoing monitoring activities.
    - The policies and procedures should address how the SSOA will observe RTA personnel performing their job functions to assess whether the functions are performed safely, to RTA standards, and at the required frequency. Inspecting ongoing task performance, conducted over time, may reveal practical drift, help improve RFGPTS performance, and give the inspector valuable perspective on day-to-day RFGPTS operations. The policies and procedures should address areas of specific need for ongoing monitoring such as operations centers, maintenance facilities, and training facilities.

- **Defects and Corrective or Remedial Actions** – Describe the inspections that review RFGPTS defects and associated corrective or remedial actions.
    - The policies and procedures should ensure that SSOA efforts are focused on significant RFGPTS defects, either by severity or quantity. The policies and procedures should include how the SSOA will track defects, corrective actions, and remedial actions, either through the existing corrective action plan (CAP) process or through another tracking mechanism, such as a spreadsheet.
    - For ease of tracking and data analysis, the policies and procedures may establish basic defect categories and a naming convention that clearly links each defect to its remedial action. The SSOA may consider tracking defects by a defect number when multiple similar defects are found in the same area to better track and categorize defects.

- **CAP and Safety Risk Mitigation Verification** – Describe the inspections that verify the progress towards and or completion of CAPs and implementation of safety risk mitigations.
    - The policies and procedures for CAP and safety risk mitigation verification should allow the SSOA to monitor progress and assess the CAP and safety risk mitigation implementation. These policies and procedures could identify areas of potential practical drift which may take place as the CAP or safety risk mitigation is implemented over time.

Required Submissions

1. Submit SSOA Program Standard and citation of Agency Safety Plan language for each RTA the SSOA oversees that demonstrate consistent and descriptive policies and procedures to conduct risk-based inspections. At a minimum, these policies and procedures must address:
    - Scheduling inspections
    - Inspection reports

- Immediate safety concerns
- Inspections of equipment, infrastructure, and practices specific to each RFGPTS
- Event verification
- Ongoing monitoring
- Defects and corrective or remedial action
- Corrective Action Plan (CAP) and safety risk mitigation verification

Category 3: Data Sources and Collection

a) RTA Must Share Safety Data

49 U.S.C. § 5329(k)(2)(A)
A rail fixed guideway public transportation agency shall provide the applicable State safety oversight agency with the data that the rail fixed guideway public transportation agency collects when identifying and evaluating safety risks.

49 U.S.C. § 5329(k)(2)(B)
A State safety oversight agency, in consultation with each rail fixed guideway public transportation agency that the State safety oversight agency oversees, shall establish policies and procedures for collecting data described in subparagraph (A) from a rail fixed guideway public transportation agency, including with respect to frequency of collection, that is commensurate with the size and complexity of the rail fixed guideway public transportation system.

A risk-based inspection program requires the collection and analysis of large sets of complex data and a mechanism for evaluating that data to inform inspection activities. The RTA must share safety data with the SSOA so that the SSOA can use the data sources as part of the risk-based inspection program. SSOAs, in consultation with each RTA the SSOA oversees, must establish policies and procedures for collecting data from the RTA. These policies and procedures should define the data sets to be shared, the processes for sharing each data set, and the frequency that the data will be shared. The SSOA should have policies and procedures in place regarding how they will use the data to prioritize inspections to address safety concerns and hazards based on associated safety risk.

As required by the PTASP rule (49 CFR Part 673), every RTA must establish and implement a Safety Management System (SMS). Safety Risk Management is a component of SMS and includes processes for safety hazard identification, safety risk assessment, and safety risk mitigation. Safety Assurance is another component of SMS and includes processes for safety performance monitoring and measurement, management of change, and continuous improvement. RTA documentation of hazards and consequences, safety risk assessments, risk ratings, mitigations, mitigation effectiveness monitoring, and other Safety Risk Management and Safety Assurance data may be very useful to support the SSOA's risk-based inspection program.

Each RTA may store and manage its data slightly differently according to its Agency Safety Plan. A robust risk-based inspection program will fully leverage each RTA's data management system. The SSOA should be aware of all relevant data systems used by the RTA and should understand how each RTA uses this data to identify hazards and assess safety risk. SSOAs may work with each RTA to secure access to the RTA's safety data systems, which could streamline data sharing practices for both the RTA and the SSOA.

Data that the RTA uses to identify hazards and assess safety risk can be organized and presented in a manner specific to each RTA's Agency Safety Plan. The data should inform each SSOA's risk-based inspection activities. SSOA policies and procedures regarding data sharing with the RTA should address the collection of the following types of data:

Safety Program Data, which includes:

- Records of events, including primary source information from each RTA investigation if the RTA completes investigations on behalf of the SSOA
- Hazard records, including hazard source, associated consequences, safety risk ratings, and the status of any mitigations
- Safety risk mitigation records, including before and after risk ratings, and how the RTA monitors the implementation and effectiveness of safety risk mitigations
- Corrective Action Plans
- Records of near misses

Maintenance Data, which includes:

- Inspection and maintenance records and report forms
- Work orders
- Records of failures and defects
- Records of revenue vehicles out of service, including causal information
- Major maintenance activity schedule and progress
- Adherence to maintenance schedules, including reports and documentation of deferred maintenance

Inspection Data, which includes:

- Inspection records and report forms
- Records of failures and defects
- Records of speed restrictions
- Event and Safety Risk Mitigation Verification
- Adherence to inspection schedules, including reports and documentation of inspections not performed
- Capital project schedules and progress

Required Submissions

1. Submit SSOA Program Standard and citation of Agency Safety Plan language for each RTA that the SSOA oversees that specifically states the RTA must provide its SSOA with the data the RTA collects when identifying hazards and assessing and mitigating safety risk.

2. Submit SSOA Program Standard and citation of Agency Safety Plan language for each RTA that demonstrates consistent policies and procedures for sharing the data that RTA collects when identifying hazards and assessing and mitigating safety risk. At a minimum,

these policies and procedures should define the safety data sets to be shared, define the processes for sharing the data, and define the frequency that the data will be shared.

3. Submit SSOA Program Standard language that demonstrates that the SSOA will collect the following subcategories of data from each RTA they oversee:
    - Safety Program Data
    - Maintenance Data
    - Inspection Data

b) Additional Safety Data

Aside from safety data collected and shared by an RTA, the SSOA can rely on other datasets to inform its risk-based inspection program and should consider using additional datasets to create a more effective risk-based inspection program. Additional data may be useful to help agencies prioritize inspections. Described below are other possible data sources that the SSOA should consider using when developing its risk-based inspection program. This list is not intended to be comprehensive. Rather, it is provided to encourage SSOAs to evaluate efficient and beneficial data sources for incorporation into their risk-based inspection programs. SSOAs are encouraged to use all data sources that may provide safety data relevant to developing and implementing their risk-based inspection program.

State Safety Oversight Agency Reporting – The SSOA already collects data from the RTA to complete its Part 674 annual report to FTA and the RTA Board of Directors. This data includes information about the following:

- Accidents including the location, number of injuries or fatalities, estimated property damage, and probable cause
- CAPs, including the proposed and actual implementation date, status, and related incidents
- RTA internal audits
- SSOA reviews of RFGPTS

National Transit Database Reporting – The RTA submits data to the National Transit Database (NTD) through monthly and annual reports. Information that the RTA submits to the NTD includes, but is not limited to, the following:

<u>General Information</u>

- Basic organizational and service area information (Agency Name, Address)
- Data collected from agencies (reported to the NTD) on the B-10 form and published annually each fall in the NTD's Agency Information database file
- The NTD's Agency Information Database File can be used to isolate transit agencies reporting data to the NTD that have rail fixed guideway using the "TAM Tier" column and filtering to Tier I (Rail)

Financial Information

- Sources of funding for operating and capital expenses, including the total amount earned by the RTA and the amounts applied to operating and capital expenses
    - Data collected from agencies on the form F-10 and published annually in the fall in the NTD's "Revenue Sources" database file and time series 1.2 file. It is summarized on the Time Series 1.2, Operating and Capital Funding time series (navigate through different tabs for both operating and capital). Despite the name, this file has both sources and uses of funding and should be used carefully to avoid double counts. To avoid double counts, filter on "Funds Expended Type" to either "Funds Earned During Period," or "Funds Expended on Capital and Funds Expended on Operations"
- Funds expended on capital projects by function, such as improvement, rehabilitation, and expansion, and by category, such as guideway, passenger station, and maintenance buildings. Data is not attributable by individual project.
    - Data collected from agencies on the form F-20 and published annually in the fall in the NTD's "Capital Use" database file and time series 1.2 file. It is summarized on the Time Series 1.2, Operating and Capital Funding times series (navigate through different tabs for both operating and capital)
- Financial and operating data for RFGPTSs that purchase or sell transit service. This consists of financial data relating to their contractual relationships.
    - Data collected from agencies on the B-30 form and published collected data annually in the fall in the NTD's Contractual Relationships database file
- Funds expended on operations by cost type (called 'function' in the NTD), such as salary, utility, and material and by category, such as vehicle maintenance, administration, and vehicle operation
    - Data collected from agencies on the F-30 form
    - Published collected data annually in the fall in the NTD's Operating Expenses database file

Asset Information

- Revenue vehicle information, such as type, total number, and active fleet vehicles, rebuild status, and average lifetime miles
    - Data collected from agencies on the A-30 form. Data collected by vehicle fleets, not individual vehicles.
    - Data published annually in the fall in the NTD's Revenue Vehicle database file and in the data tables file
- Number of revenue vehicle system failures
    - Data collected from agencies on R-20 form and
    - published annually in the fall in the NTD's Vehicle Maintenance database file

Service Data

- Monthly ridership and service data, including unlinked passenger trips, vehicle revenue hours and miles, and vehicles operated in maximum service
    - Data collected from agencies on the MR-20 form
    - Data published monthly for agencies with rail modes (these are a subset of what the NTD refers to as "Full Reporters") on the Adjusted Monthly Ridership file. There is a related file that is not "adjusted," which does not include estimates for a small number of late reporters that are missing the most recent NTD for a variety of reasons. For most purposes, the adjusted file is the preferred file. Also note, although the file is called "ridership" (referred to as "Unlinked Passenger Trips" or UPT in the NTD, it contains measures of service supplied as well, such as Vehicle Revenue Miles (or VRM).
- Annual service data, including a range of detailed service supplied and service consumed data categories
    - Data collected from agencies on the S-10 form. Data collected by agency, mode, and type of service.
    - Data published annually in the fall in the NTD's Service database file and in the data tables file

Safety and Security Information

- Monthly non-major event summary, including the number of slips and falls and non-major fires and the number of injuries
    - Data collected on the form S&S-50
    - Data is published monthly. It is processed and merged with S&S-40 data (major events), which is published on FTA's website.
- Rolling data for major safety and security events
    - Data collected on the form S&S-40
    - Data is published in the same file as the non-major events. Also, a full, detailed dataset by event can be found on FTA's website. You can analyze this data through the Socrata platform. Or if you click "View Data," then "Export," then "Download," you can download the data locally and analyze in Microsoft Excel.

Other Data Sources – Transit agencies, as part of operations, may collect patron and customer feedback on their RFGPTS. These logs can be particularly helpful to identify safety concerns. Additionally, RTA security log information could also be incorporated into the data sets that each SSOA uses to prioritize inspections.

c) Establishing and Maintaining a Risk-Based Inspection Data Management System

49 U.S.C. § 5329(k)(4)(B)
the inspection program of the State safety oversight agency is risk-based;

A risk-based inspection program requires processes and systems to store, organize, and facilitate data analysis. A risk-based inspection data management system supports the management and organization of collected data sets and enables efficient and effective data analysis. Effective data management sets the foundation for data analysis that will guide the development of risk-based inspection activities. Therefore, a risk-based inspection data management system (data management system) is a key component of a risk-based inspection program.

A data management system includes:

- A physical or digital system that has the capacity to store records according to the SSOA's risk-based inspection data management system policies and procedures.
- Policies and procedures that identify:
  - How data sets will be stored and used for analysis
  - Where the data sets will be stored
  - How the data will be organized
  - How long records must be kept
  - How and when records are disposed
  - How the SSOA will ensure the system is maintained
  - How the SSOA will ensure the system accurately stores records

The data management system should enable the SSOA to collect, record, organize, and analyze the large data sets needed to properly implement a risk-based inspection program. The data management system can be computer based, and the SSOA could choose to develop its own data management system. However, the SSOAs are not required to develop a standalone program. A data management system could be partially computer or database based, or not digital at all.

Required Submissions

1. Submit SSOA Program Standard that includes the policies and procedures of the risk-based inspection data management system. The Program Standard must demonstrate the SSOA's data management system capacity to store records according to the SSOA's risk-based inspection data management system policies and procedures, including how the data management system is managed and maintained. Additionally, SSOAs must provide documentation that verifies the data management system accurately stores records according to the SSOA's risk-based inspection data management system policies.

Category 4: Inspection Prioritization

a) SSOAs must prioritize safety concerns to inform their inspection program

49 U.S.C. § 5329(k)(4)(B)
the inspection program of the State safety oversight agency is risk-based;

A risk-based inspection program requires that SSOAs prioritize inspection activity through data analysis. SSOAs can use the information derived from data analysis to guide the implementation of their risk-based inspection programs so that highest risk conditions are addressed first. Data review and analysis should be done continuously so that changes at each RFGTPS are reflected in the risk-based inspection programs. SSOAs should perform comprehensive data analysis of various data types, including analysis of Safety Program Data, Maintenance Data, and Inspection Data types. Analysis of these data types should inform SSOA inspections that include, but are not limited to, the following:

- Equipment, infrastructure, and practices specific to each RFGPTS
- Event verification
- Ongoing monitoring (procedures, maintenance, and operations)
- Defects and corrective or remedial action
- CAPs and safety risk mitigation verification

The first step in inspection prioritization is to determine which safety metrics will be used. The SSOA should determine, and incorporate into the Program Standard, the specific safety metrics that the SSOA will use to prioritize inspections by evaluating relevant data. Relevant data includes data shared by the RTA such as safety program data, maintenance data, and inspection data. SSOAs should preform comprehensive data analysis of safety program metrics data, maintenance data, and inspection data types, and this analysis should inform SSOA risk-based inspection elements and practices. The SSOA should consider using metrics including, but not limited to, the number and status of RTA-identified and SSOA-identified defects; the number and type of events, CAPs, and hazards in an area; the number and type of inspections conducted in an area; and repeat concerns.

The metrics discussed below may not be applicable to each SSOA or RTA but can be used as a reference to help determine which safety metrics to evaluate for future risk analysis. Possible data metrics include the following:

- ***Safety Program Data Elements:***

  Number and Type of Events, CAPs, and Verification of Safety Risk Mitigation Implementation and Effectiveness in an Area
  The SSOA could assess the number and type of events by area, such as by line, portion of track, or station. In addition to assessing the raw totals, the SSOA could evaluate this number over a period of time and should consider causal data, such as equipment failures,

stop signal violations due to human factors, or poor maintenance. For CAPs, the SSOA could assess time to closure. For safety risk mitigations, SSOAs could review the effectiveness of safety risk mitigations.

- ***Maintenance & Inspection Data Elements:***

  Number and Status of RTA-Identified Defects
  The SSOA could account for the number and status of defects collected directly from the RTAs data system or through reporting requirements to assess the number of open issues in each segment. In addition to collecting raw totals, the SSOA could collect data on how long defects remain open and what the level of severity is for each defect. The SSOA could normalize this data over a standard distance, such as open defects per mile, average time to close defects, or reported defects per mile weighted by severity to identify substantial changes to the number of defects reported over a given period of time.

  Number and Status of SSOA-Identified Defects
  The SSOA could account for the number and status of defects identified during SSOA inspections. In addition to assessing the raw totals, the SSOA could assess how long defects remain open and identify defect severity using the RTA's established severity ranking system. The SSOA could normalize this data over a standard distance, such as open defects per mile, average time to close defects, or reported defects per mile weighted by severity to identify substantial changes to the number of defects reported over a given period of time.

  Number and Type of Inspections Conducted in an Area
  The SSOA could determine the number and type of inspections in an area and could compare this number with the expected number of inspections based on the RFGPTS inspection schedule. This assessment could include inspection compliance over a set period and the number of consecutive missed inspections in the same period. The SSOA may highlight specific inspections or maintenance activities that present a higher risk if not completed.

  Recurring Deficiencies
  The SSOA could assess recurring deficiencies identified in either inspection processes or maintenance or performance records.

The second step in inspection prioritization is to develop prioritization procedures. The SSOA should establish methods to analyze the collected data to prioritize safety concerns for inspections. The SSOA can develop this prioritization methodology to meet the demands of its program. As part of this methodology, the SSOA could group elements into categories, and then develop a corresponding prioritization score or rating. For example, the SSOA could rate vehicle maintenance risk by car or car series, depending on the available data. The score or rating of each category may be calculated differently and should be tailored to the data collected for that category.

For example, the SSOA could assess vehicle maintenance risk through factors such as mechanical failures over the past month, age of the vehicle, or historical performance.

A key step in developing a prioritization score or rating is determining how to scale prioritization ratings. Two potential options are a percentage-based scale and a goal-based scale:

- *Percentage-Based Scale:* In a percentage-based scale, the SSOA assigns a higher rating to the upper percentages of the metric. For example, if an SSOA uses mechanical failures over the last month as a metric for prioritizing rail car inspections, the SSOA would rate rail cars in the top ten percent of failures as a higher priority than those in the bottom ten percent of that category.

- *Goal-Based Scale:* In a goal-based scale, the SSOA establishes a goal for each metric used in prioritizing safety concerns and bases the score on the metric's proximity to that goal. Using the same example as above, the SSOA would assign priority based on how close it was to a target, such as the number of failures per month. Equipment that is furthest from the goal (i.e., with a higher number of failures) will receive higher prioritization.

The third step in inspection prioritization is to prioritize inspections within each RFGPTS and between all RFGPTS a SSOA oversees. The SSOA should develop policies and procedures that describe how to prioritize inspections for each RFGPTS it oversees and how it will inform each RTA of the specific risk-based inspections. If a SSOA oversees more than one RTA, the SSOA should also develop a procedure for clearly identifying and prioritizing safety concerns among the RFGPTS's it oversees. There should be clear documentation that relates the outcomes of the safety concern and prioritization analysis to the risk-based inspection program inspections and actions.

The data analysis and prioritization process should be an ongoing process of collecting data, analyzing that data, developing prioritization ratings, and prioritizing inspections. SSOAs should continuously update data analysis procedures, prioritization rating procedures, and prioritizations to reflect changing safety conditions. The risk-based inspection program should reflect the changing safety conditions of systems and be responsive to those conditions. At a minimum, SSOAs should perform the safety concern analysis and inspection prioritization process for each system it oversees at least once per year.

The SSOA must document its inspection prioritization process (policies and procedures) in its Program Standard.

Required Submissions

1. Submit SSOA Program Standard language that specifies the SSOA's prioritization process for its risk-based inspection program, including data analysis procedures, safety concern prioritization rating procedures, and inspection prioritization procedures.

2. Submit SSOA Program Standard language that describes a continuous process for risk-based inspection prioritization that specifies the frequency of data analysis, safety concern prioritization, and inspection prioritization.

Category 5: Risk-Based Inspection Programs Are Commensurate with Number, Size, and Complexity of the RFGPTS

49 U.S.C. § 5329(k)(4)(A)
In assessing the capability of a State safety oversight agency to conduct inspections as required under paragraph (1), the Secretary shall ensure that—

(A) the inspection practices of the State safety oversight agency are commensurate with the number, size, and complexity of the rail fixed guideway public transportation systems that the State safety oversight agency oversees.

The SSOA must ensure that the risk-based inspection program it develops considers the number, size, and complexity of the RFGPTS under its authority.

While risk-based inspections should be frequent and consistent, not all RFGPTS share the same risk profile. The SSOA should tailor the scope of its inspection activities for each RFGPTS based on its size and complexity and the SSOA's safety concern prioritization activity. For example, the SSOA may implement a more robust inspection program at its multimodal RFGPTS than at a single mode RFGPTS if collected data validate that decision. Similarly, if an SSOA oversees an RFGPTS that is less complex but has a higher level of safety risk due to known non-conformances with operational policies and procedures or poor safety culture, the SSOA may determine to prioritize more risk-based inspections at that agency in a particular year. The policies and procedures incorporated into the SSOAs Program Standard should reflect the nature of the RFGPTS the SSOA oversees.

The SSOA's Program Standard must include policies and procedures that demonstrate that the SSOA will:

- Administer risk-based inspections for all RFGPTS that the SSOA oversees.
    - If the SSOA is responsible for more than one RFGPTS, the SSOA may establish its policies and procedures for each RFGPTS individually or may establish one set of policies and procedures that apply to all RFGPTS the SSOA oversees.
- Perform consistent and ongoing risk-based inspections of each RFGPTS the SSOA oversees.
    - Consistent and ongoing site inspections are intended to ensure that SSOAs are frequently and consistently inspecting areas of a transit system associated with the highest levels of safety risk. *At a minimum, SSOAs should consider at least four onsite risk-based inspections per RFGPTS per year no matter the risk profile or distance between the SSOA and RFGPTS it oversees.*

- Inspect the full spectrum of activities for each RFGPTS it oversees and that those inspections are prioritized based on relevant data, including safety program, maintenance, and inspection data collected by the SSOAs, such as:
    - Scheduling inspections
    - Inspection reports
    - Immediate safety concerns
    - Inspections of equipment, infrastructure, and practices specific to each RFGPTS
    - Event verification
    - Ongoing monitoring (procedures, maintenance, and operations)
    - Defects and corrective or remedial action
    - CAP and safety risk mitigation verification

Required Submissions

1. Submit SSOA Program Standard policies and procedures that demonstrate the SSOA will administer risk-based inspections programs commensurate with the complexity of each RTA that an SSOA overseas.

2. Submit SSOA Program Standard policies and procedures that demonstrate consistent and ongoing risk-based inspections of each RTA that an SSOA oversees.

3. Submit SSOA Program Standard policies and procedures that demonstrate the SSOA inspects the full spectrum of activities for each RTA it oversees and that those inspections are prioritized based on relevant data, including safety program, maintenance, and inspection data collected by the SSOAs.

Category 6: SSO Staffing, Qualifications, and Training

a) SSO Staffing, Qualifications, and Training

49 U.S.C. § 5329(k)(4)(C)
In assessing the capability of a State safety oversight agency to conduct inspections as required under paragraph (1), the Secretary shall ensure that—
(C) the State safety oversight agency has sufficient resources to conduct the inspections.

Each SSOA must have sufficient staff and resources to conduct the risk-based inspection program. The staff must have the capacity to perform risk-based inspection program activity for each RFGPTS they oversee in a manner commensurate with the size, number, and complexity of those systems.

The SSOA must update and submit its formal plan for organizing and staffing its State Safety Oversight (SSO) program. This plan must also include updated staffing numbers and validation that the State personnel are qualified to implement the SSO program. SSOAs must provide the following documentation to FTA:

- *Updated Workload Assessment*
    - SSOAs must update their agency's workload assessment to align with any changes to the SSOA's oversight responsibilities, including those related to a new or expanded inspection program. The updated workload assessment must include relevant technical disciplines that could include data analysis, risk assessment, track, power, signals, vehicles, operations, and communications that apply to the RFGPTS the SSOA oversees.
- *Verification of Inspections Personnel Qualifications*
    - SSOAs must staff and resource their risk-based inspection programs with personnel skilled in the competencies needed to fulfill program requirements such as data analysis, risk assessment, and inspection. The SSOA must be able to verify the capability of its personnel to conduct oversight activities, including those related to the risk-based inspection program. SSOAs may consider utilizing industry experts such as State Participation Program Inspectors qualified through the FRA or Occupational Safety and Health Administration inspectors qualified through any of a State's available programs to support specific activities or reviews, as well as contractors and personnel developed through State training, certification, and professional development programs.

- *Updated Technical Training Plan (TTP)*
    - SSOAs must update their TTP to align with any changes to the SSOA's oversight responsibilities, including those related to a risk-based inspection program. The updated TTP should reflect capacity and necessary training for each technical discipline. The TTP should include any training required by the RTA to access areas of the RFGPTS, such as Roadway Worker Protection training. Inspectors should receive full safety training at each RFGPTS prior to accessing areas that require safety training and should complete refresher or recertification courses as required.

Required Submissions

1. Submit an updated workload assessment to align with increased responsibilities of the risk-based inspection program.

2. Submit documentation that confirms the qualifications and capability of SSOA personnel conducting risk-based inspections in required areas of expertise.

3. Submit an updated Technical Training Plan to align with the increased responsibilities of SSOA risk-based inspection programs.