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Safety Assurance

July 11, 2019

U.S. Department of Transportation
Federal Transit Administration

Webinar Objectives and Topics

Objectives

- To help transit agencies understand requirements for Safety Assurance in the Public Transportation Agency Safety Plan (PTASP) regulation at 49 C.F.R. Part 673.

- To support the development of an Agency Safety Plan (ASP).

Topics

- What is Safety Assurance?

- Safety Assurance requirements

- Considerations for developing the Safety Assurance section of an ASP

Safety Management System (SMS) Components

What's Unique About Safety Assurance?

Safety Risk Management (SRM) and Safety Assurance (SA) are the key processes and activities for managing safety.

Safety Management Policy (SMP) and Safety Promotion (SP) provide the structure and supporting activities to make SRM and SA possible and sustainable.

Actions VS **Enablers**

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Safety Assurance Definition

- Processes for the collection, analysis, and assessment of information.

- Help to ensure:
  - Safeguards are in place and actually effective.
  - Early identification of potential safety issues.
  - Safety objectives are met.

§ 673.5 Definitions

Safety Assurance means processes within a transit agency's Safety Management System that function 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.

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Safety Assurance Applicability (§ 673.27(a))

Must meet requirements in (b), (c), and (d)	Must meet requirements in (b) only
• **Rail fixed guideway public transportation systems.** • **Recipients or subrecipients** of Federal financial assistance under 49 U.S.C. Chapter 53 that **operate more than one hundred vehicles in peak revenue service**.	• **Small public transportation providers**—recipients or subrecipients of Federal financial assistance under 49 U.S.C. 5307 that have **100 or fewer vehicles in peak regular service** (across all non-rail fixed route modes or in any one non-fixed route mode) and **do not** operate a rail fixed guideway public transportation system.

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Documentation requirements to keep in mind throughout this webinar (§ 673.31)

Transit agencies must maintain documentation and recordkeeping of:

- Establishing the ASP, including documents included in whole or by reference;

- Programs, policies, and procedures to carry out the ASP;

- SMS implementation activities; and

- Results from SMS processes and activities.

Transit agencies must maintain these documents for a **minimum of three years** after they are created, and **make them available upon request** by the FTA, other Federal entity, or for rail transit agencies, their applicable State Safety Oversight Agency (SSOA).

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Sample List of Documented SA Process Elements

❑ SA definitions

❑ Authorities, accountabilities, and responsibilities for the SA process, including:

   ❑ Safety performance monitoring and measurement

   ❑ Management of change and continuous improvement (for agencies with more than 100 vehicles operating in peak service)

❑ Process, methods or approach for monitoring compliance with, and sufficiency of, the agency's procedures for operations and maintenance, including:

   ❑ List of operations and maintenance procedures to be monitored.

   ❑ Monitoring methods, frequency, forms, checklists, and tools.

   ❑ Methods and system for collecting and compiling compliance and sufficiency data, information, trends and reports.

   ❑ Safety performance measures and targets and other means used to evaluate compliance and sufficiency.

   ❑ Criteria and method for documenting, reporting and resolving non-compliance and sufficiency issues.

   ❑ Process for evaluating identified safety concerns through the agency's SRM process.

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Sample List of Documented SA Process Elements

❑ Process for monitoring operations to identify safety risk mitigations that may be ineffective, inappropriate, or not implemented as intended, including:

  ❑ Methods, tools, forms and criteria for documenting and monitoring mitigations.

  ❑ Criteria for identifying ineffective and inappropriate mitigations and those that are not performing as intended.

  ❑ Safety performance measures and targets and other means used to evaluate the effectiveness, appropriateness, and implementation of mitigations.

  ❑ Process for documenting and resolving ineffective, inappropriate or poorly performing mitigations.

  ❑ Process for evaluating identified safety concerns through the agency's SRM process.

❑ Approach for conducting investigations of safety events to identify causal factors, including:

  ❑ Investigation procedures, forms, checklists, report templates, and completed reports.

  ❑ Supporting materials for conducting investigations (i.e., driver and witness statements, supervisor reports, police reports, camera footage and electronic device recordings and records, photographs, analysis reports, etc.).

  ❑ Method for documenting mitigations in place at the time of the safety event and for assessing their effectiveness.

  ❑ Process for identifying, documenting, and addressing causal factors.

  ❑ Process for evaluating identified safety concerns through the agency's SRM process.

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Sample List of Documented SA Process Elements

❑ Process for monitoring information reported through any internal safety reporting programs, including:

  ❑ List of internal safety reporting programs to be monitored.

  ❑ Process for reviewing, managing and responding to information captured in the Employee Safety Reporting Program.

  ❑ Process for reviewing, managing and responding to information from other reporting programs at the agency.

  ❑ Process for evaluating identified safety concerns through the agency's SRM process.

❑ A method or process for identifying and assessing changes that may introduce new hazards or impact the transit agency's safety performance, including any tools, forms, or thresholds/matrices used to support and document the assessment, and an approach for evaluating proposed changes through the agency's SRM process. (For agencies with more than 100 vehicles operating in peak service, and/or operating rail.)

❑ A method or process to assess safety performance to support continuous improvement and to identify, document and carry out, under the direction of the Accountable Executive, a plan for addressing identified safety deficiencies. (For agencies with more than 100 vehicles operating in peak service, and/or operating rail.)

SAFETY PERFORMANCE MONITORING & MEASUREMENT

Safety Performance Monitoring and Measurement Requirements

- Focused on **current** agency processes and activities.

- To **validate expectations** and **identify system changes:**

  – Do our assumptions match reality? Is there something we missed that could be a safety concern?

  – How is the system changing? Is the change a safety concern?

§ 673.27

b) Safety performance monitoring and measurement. A transit agency must establish activities to:

1) Monitor its system for compliance with, and sufficiency of, the agency's procedures for operations and maintenance;

2) Monitor its operations to identify any safety risk mitigations that may be ineffective, inappropriate, or were not implemented as intended;

3) Conduct investigations of safety events to identify causal factors; and

4) Monitor information reported through any internal safety reporting programs.

What Does Safety Performance Monitoring and Measurement Look Like?

- **Roles and responsibilities could vary**, for example:
  - Safety Department could perform monitoring and measurement.
  - Safety Department could oversee monitoring performed by other departments, and conduct measurement.
  - Operations and Maintenance Departments could conduct monitoring and measurement, while the Safety Department oversees and develops reports for decision-makers.

- May consider how to address potential drawbacks of self assessment, while leveraging subject matter expertise to notice what doesn't look right.

Examples of Information Collection, Analysis, and Assessment Approaches

Collection
- Existing data sources
- Direct observation
- Sampling

Analysis
- Trend analysis
- Statistical analysis

Assessment
- Subject matter expertise
- Management decision-making
- Safety performance indicators and targets

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What Does Safety Performance Monitoring and Measurement Look Like?

- Consider defining:

  - **Methods** to monitor and measure;

    - Including roles and responsibilities

  - **Scope** (the focus and level of effort) of activities; and

  - **What happens next** when issues are identified.

Mapping Safety Performance Monitoring and Measurement Processes – Example

Safety Assurance Process	If yes, then…
Procedures Monitoring and Measurement	
Inadequate compliance?	Address non-compliance
Insufficient?	Evaluate hazards through SRM
Safety Risk Mitigation Monitoring and Measurement	
Ineffective?	Evaluate hazards through SRM
Inappropriate?	Identify new mitigation under SRM
Not implemented?	Address non-compliance
Safety Event Investigations	
Causal factors identified?	Evaluate hazards through SRM
Information collected?	Use to monitor and measure through other SA processes
Internal Reporting Programs Monitoring and Measurement	
Safety concerns identified?	Evaluate hazards through SRM
Information collected?	Use to monitor and measure through other SA processes

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Monitoring Operations and Maintenance Procedures
(§ 673.27(b)(1))

Must monitor system for **compliance** with and **sufficiency** of **operations and maintenance procedures.**

- Could address **non-compliance** through training, coaching, and management oversight, among other approaches.

- Could address **insufficient procedures** through Safety Risk Management.

Monitoring Safety Risk Mitigations (§ 673.27(b)(2))

Must monitor operations to **identify safety risk mitigations** that may be **ineffective, inappropriate,** or were **not implemented as intended.**

- If **ineffective**, could re-analyze the hazard(s) and consequence(s) the mitigation was intended to address through SRM.

- If **inappropriate**, could identify new mitigation options.

  – The mitigation may not be feasible.

- If **not implemented as intended**, could consider alternative mitigations or alternative approaches to implementation.

Safety Performance Indicators and Targets

Safety Performance Indicator (SPI)	Safety Performance Target (SPT)

• A **signal** or **early warning sign**
 	
• Can measure inputs, outputs, outcomes, or impacts
 	
   – For example, the number of hard braking events per month on Bus Route 45.
	• Level or extent of **expected change** in the SPI **over a period of time**
	
	• Quantifiable
	
	   – For example, hard braking events per month are **10% lower** on Bus Route 45 **over the next 12 months.**

Types of SPIs for Safety Performance Monitoring and Measurement

Lagging Indicators

- Monitor **negative safety outcomes** the agency aims to prevent.
  - For example, the number of collisions caused by icy road conditions.
- Data may be more readily available.
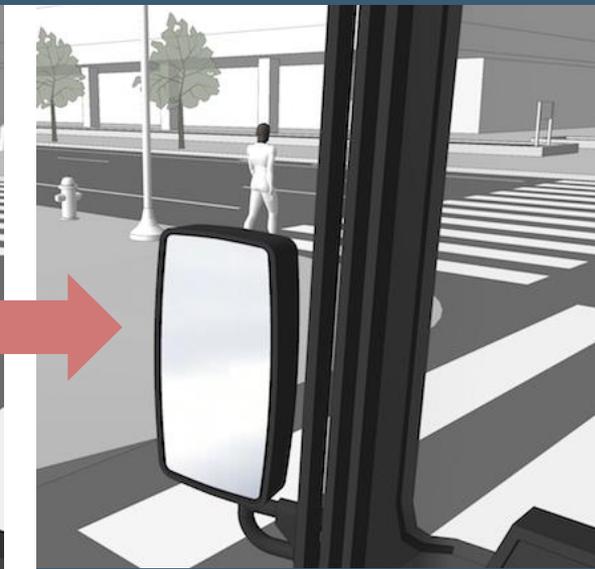
Leading Indicators

- Monitor conditions with **potential to become or contribute to negative safety outcomes.**
- Can be focused on monitoring operational and environmental conditions or agency processes.
  - For example, the number of days of freezing rain.
- More useful for safety performance monitoring and measurement than lagging indicators.

SPIs for Safety Risk Mitigation Monitoring Example

Bus mirror is moved to reduce visual obstruction

Mirror obstructs the operator's view of pedestrians during left-hand turns

Mirror placement reduces obstruction of the operator's view during left-hand turns

Lagging Indicator:

- Number of collisions with pedestrians during left-hand turns.

Leading Indicators:

- Percentage of mirrors adjusted.

- Number of operator reports about mirrors blocking line of sight.

- Number of complaints of near-collisions from bicyclists and pedestrians.

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Setting SPIs for Safety Performance Monitoring and Measurement

When establishing safety performance indicators, it may be helpful to consider:

- **What is a reliable indicator – or set of indicators – of what we are trying to monitor?**

    - Consider alternatives if an indicator isn't a reliable source of information.

- **What is the minimum number of indicators needed?**

    - A large set of indicators can be resource-intensive to monitor over time.

- **Are there existing data sources we can use to monitor the indicator?**

    - If not, consider allocating monitoring resources based on safety risk.

Setting SPTs for Safety Performance Monitoring and Measurement

What can we expect to see by monitoring the indicator?

A target doesn't need to be perfect.

How precise does the target need to be for measurements to provide useful information for decision-making?

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Question 1 – choose one

Does your agency use safety performance data to inform decision making?

- ❑ Yes
- ❑ Sometimes
- ❑ No
- ❑ I am not sure
- ❑ N/A

Mitigation Monitoring Plans

Mitigation Monitoring Plans **help ensure safety performance monitoring and measurement activities are performed** to confirm that mitigations are effective, appropriate, and fully implemented.

Contents of a Mitigation Monitoring Plan may include, but are not limited to:

Selected safety risk mitigation(s)	Safety performance indicators and targets	Data sources used for monitoring	Description of performance monitoring activities
Timeframe of safety performance monitoring activities	Safety performance monitoring responsibility	Safety performance reporting frequency	Safety performance reporting format

Corrective Action Plan vs Mitigation Monitoring Plan

Corrective Action Plan (CAP)

- Documents the corrective action.
- Typically addresses short-term defects or compliance issues.
- Helps ensure the corrective action is implemented.

Mitigation Monitoring Plan (MMP)

- Documents mitigation(s) and monitoring activities.
- Defines how the transit agency will monitor whether the mitigation is performing as intended—implemented, appropriate, and effective.
- Helps the agency prioritize safety resource investments.

Safety Event Investigation
(§ 673.27(b)(3))

Transit agencies must **conduct investigations of safety events** to **identify causal factors.**

- Safety events include **accidents**, **incidents**, and **occurrences.**

- Investigation is important, **whether or not the event is considered preventable.**

- Identified factors could include organizational issues, technical failures, environmental conditions, among others.

- Identified causal factors **may reveal hazards** that could be addressed through SRM.

- Investigations may be an additional **source of safety data.**

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Monitoring Internal Safety Reporting (§ 673.27(b)(4))

Transit agencies must **monitor information reported through any internal safety reporting programs.**

- Including, but not limited to:
  - Employee safety reporting programs
  - Mandatory safety reporting programs (e.g., accident notification)
- **Could collect, analyze, and assess information** reported from programs over time.
- May be an important **source of safety data.**
- Analysis of reports **may lead to the identification of hazards** to address through Safety Risk Management.

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Question 2 – choose one

How would you rate your agency's process for monitoring safety risk mitigations?

❑ High – My agency has a process that effectively monitors our safety risk mitigations

❑ Moderate – My agency has an process in place, but needs some improvement

❑ Low – My agency has a process but we rarely use it as designed

❑ My agency does not have a process in place

❑ I am not sure

❑ N/A

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MANAGEMENT OF CHANGE

Management of Change Requirements

- Management of change, **not change management.**

- **Evaluates** *proposed* **or** *future* **changes.**
  - Once a change is made (e.g., new procedure implemented) it may be monitored through other SA activities.

- **Focused on non-safety changes.**
- Recommended, but **not required for small public transportation providers.**

§ 673.27

b) Management of change.

1) A transit agency must establish a process for identifying and assessing changes that may introduce new hazards or impact the transit agency's safety performance.

2) If a transit agency determines that a change may impact its safety performance, then the transit agency must evaluate the proposed change through its Safety Risk Management process.

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Identifying Changes
(§ 673.27(c)(1))

Transit agencies must establish a process for **identifying and assessing changes** that **may introduce new hazards** or **impact** the transit agency's **safety performance.**

- Examples of approaches include:

    - **Centralized** – A person or group assesses changes (all, or a certain type) to determine safety impacts.

    - **Decentralized** – All departments evaluate if proposed changes have a safety impact, and the Safety Department provides guidance and oversight.

- May use existing processes.

- Could identify and assess different proposed changes in different ways.

- Proposed changes can be initiated within or outside the transit agency.

Assessing Changes
(§ 673.27(c)(2))

Transit agencies must **evaluate proposed changes** that may impact safety performance **through the Safety Risk Management** process.

Transit agencies may choose to:

> Send all types of hazards through the agency's **standard SRM process**

> Establish a **separate SRM process** for addressing proposed changes (all changes or certain types)

REQUIRED SAFETY PERFORMANCE TARGETS

The Safety Performance Target Requirement in Part 673

- Transit agencies **must develop performance targets based on the safety performance measures established under the National Public Transportation Safety Plan.** § 673.11(a)(4)

Performance Measure §673.5	Performance Target §673.5
• Expression based on a quantifiable indicator of performance or condition • Used to establish targets and assess progress toward meeting targets	• Quantifiable level of performance or condition, expressed as a value for the measure, to be achieved within a time period required by FTA

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Setting SPTs Based on National Public Transportation Safety Plan (NSP) Safety Performance Measures
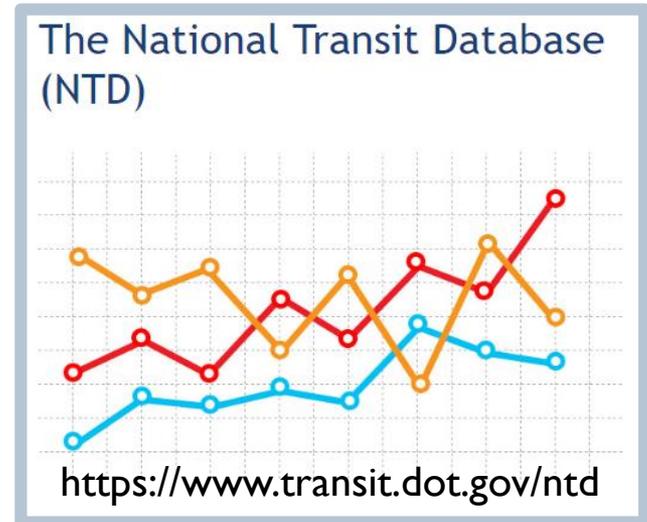
- The NSP contains four measures:

Fatalities	**Injuries**	**Safety Events**	**System Reliability**

- Part 673 **does not establish requirements for how** the safety performance targets **must be set or what they must be based on**.

- A State or transit agency **must make its safety performance targets available to** and **coordinate with** States and Metropolitan Planning Organizations (MPOs) **on the selection of State and MPO performance targets** to the maximum extent practicable. §673.15

Setting SPTs Based on NSP Safety Performance Measures

- Transit agencies can set targets for each measure based on, but not limited to:

  - **Transit agency data and experience**

  - **Benchmarking against peer transit agencies**

  - **Leadership direction**

  - **Transit industry data**

- Transit agencies may choose to also set safety performance targets:

  - **At a lower level of detail (e.g., by mode, event type)**

  - **Based on key areas of safety risk or leadership priorities**

The National Transit Database (NTD)

https://www.transit.dot.gov/ntd

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CONTINUOUS IMPROVEMENT

Continuous Improvement Requirements

- Focused on **agency-wide safety performance.**

- Assessment could use:
  - **Required safety performance targets** (e.g., number of injuries)
  - **Safety objectives**
  - Additional **agency-wide or mode-wide SPTs**

- Recommended, but **not required for small public transportation providers**.

§ 673.27

c) Continuous improvement.

1) A transit agency must establish a process to assess its safety performance.

2) If a transit agency identifies any deficiencies as part of its safety performance assessment, then the transit agency must develop and carry out, under the direction of the Accountable Executive, a plan to address the identified safety deficiencies.

Assessing Safety Performance (§ 673.27(d)(1))

Must establish a **process to assess safety performance.**

- Part 673 <u>does not</u> specify **how to conduct** assessments **or which standard** to base assessments on.

  - FTA may establish performance standards at a later time § 673.11(a)(4))

- Should be sufficient for the Accountable Executive to know **when to take action** to address inadequate safety performance.

- May choose to **develop SPIs and SPTs for safety objectives.**

- Consider a **small set of meaningful SPIs and SPTs** to measure overall safety performance.

Assessing Safety Performance (§ 673.27(d)(1))

- Safety performance assessment **might not show you *what* is wrong**, **only that *something* is wrong** that requires a closer look.

- Consider indicators for safety performance assessment that:
  - Have a **clear connection to safety performance**
  - Are **relevant to transit agency objectives and leadership goals**
  - **Measure change reliably and sufficiently** to inform decision-making
  - Are **not easy to manipulate or misinterpret**
  - Are relatively **easy to track**

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Assessing Safety Performance Examples

Transit agencies may decide to monitor safety performance based on, but not limited to:

- Safety objectives, or targets based on safety objectives

- Required safety performance targets

- Major segments of required safety performance measures

- Key sources of safety information

- Key areas of safety risk

- Performance of key safety processes or activities

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Addressing Safety Deficiencies
(§ 673.27(d)(2))

Must **develop and carry out**, under the direction of the Accountable Executive, a **plan to address identified safety deficiencies.**

- Safety deficiencies can be in the **transit agency's SMS or related to other agency processes and activities.**

- A plan to address identified safety deficiencies could involve:

  – Addressing underlying hazards and potential consequences through Safety Risk Management

  – Changing data collection or analysis techniques to better understand what's really going on

  – Testing and evaluating new approaches to SMS processes

Resources to Help You Prepare Now

Read, watch, and participate

- Review the PTASP FAQs

- Visit the PTASP Resources page to view previous webinars and documents

- Participate in webinars explaining PTASP-regulations and guidance

- Read our newsletter, *TSO Spotlight* for PTASP-related articles

Attend a workshop

- FTA is holding PTASP workshops in July, August, and September 2019 for bus and rail transit agencies. The workshops will allow participants to learn more about the rule's requirements, how to implement SMS, and to share best practices.

- Information on the workshops can be found on the FTA website under Calendar of Events and on FTA's PTASP page for registration updates

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PARTICIPANT QUESTIONS

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