Developing and Monitoring Safety Risk Mitigations

May 26, 2022

Public Transportation Agency Safety Plan
Technical Assistance Center
(PTASP TAC)

FTA
FEDERAL TRANSIT ADMINISTRATION

U.S. Department of Transportation
Federal Transit Administration

Objectives

This webinar will provide participants with knowledge and skills to support the development and monitoring of safety risk mitigations

After this presentation, participants should be able to:

- Identify mitigations in response to safety risk assessment data
- Describe processes for documenting mitigations
- Identify mitigation monitoring methods

Industry Speakers

Serena Stevenson
General Manager
Waco Transit System

Seth Page
Safety Manager
Greater Portland Metro

Agenda

1. Introduction
2. Identifying mitigations following safety risk assessments
3. Documenting mitigations
4. Monitoring mitigations
5. Questions and answers

Related Resources

Log onto FTA's PTASP TAC Resource Library for more webinars, tools, and fact sheets related to Safety Risk Management and Safety Assurance

www.transit.dot.gov/PTASP-TAC

For information related to the Bipartisan Infrastructure Law, visit www.transit.dot.gov/BIL

Contact FTA-IIJA@dot.gov with your questions related to the Bipartisan Infrastructure Law

Feedback

Your feedback helps us deliver the resources and tools that are most relevant to your needs. Based on feedback from the previous webinar surveys, this webinar features:

- Multiple speakers
- Speakers on video
- Integrated audience feedback

Please stay tuned for another survey at the conclusion of this webinar!

Audience Poll

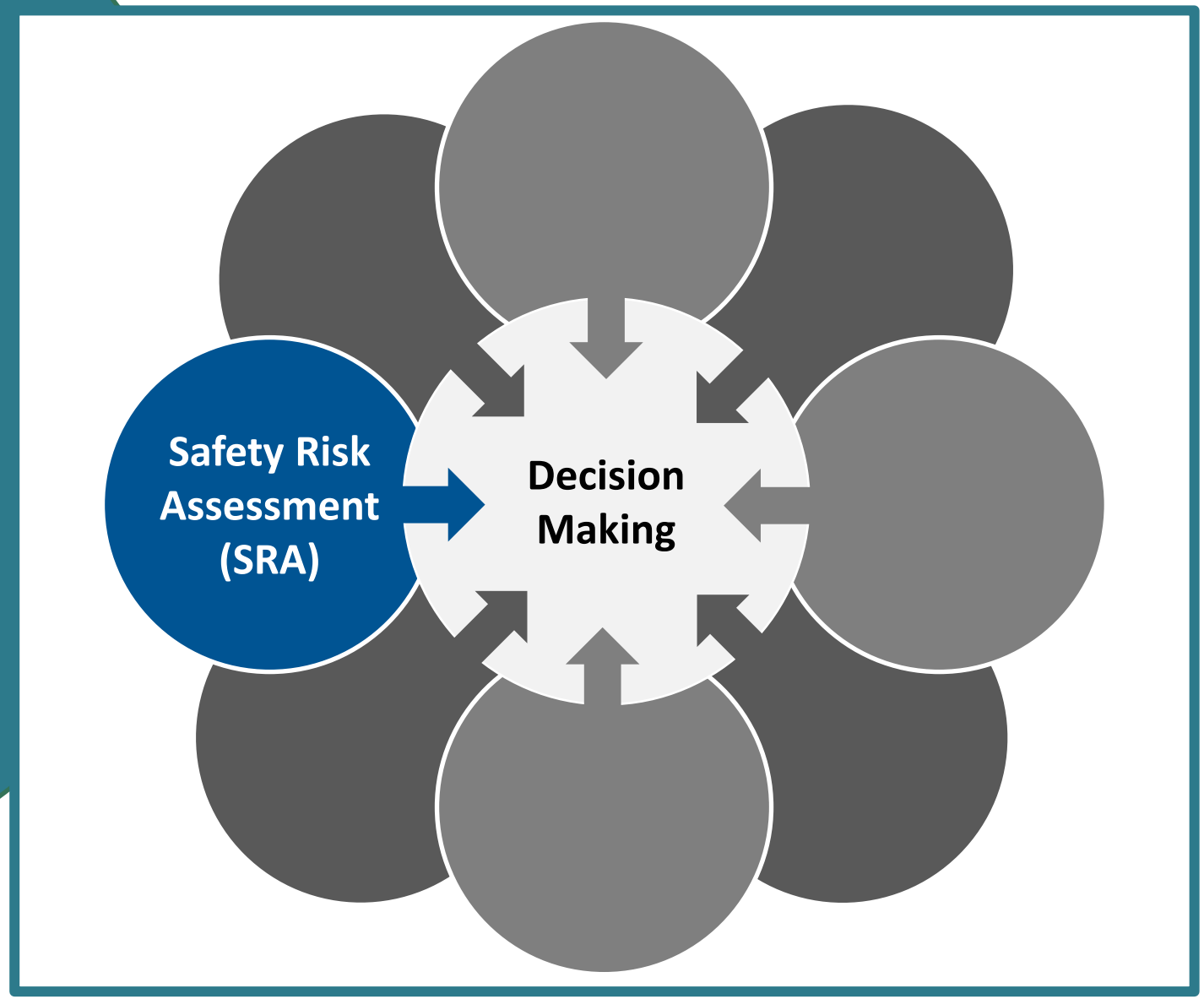
Are you personally involved in the safety risk mitigation process at your agency?

44%	Yes, both developing and monitoring mitigations
24%	Yes, developing mitigations
13%	Yes, monitoring mitigations
10%	No, not involved
9%	Not applicable

Identifying Mitigations

Safety Management Systems (SMS)

The PTASP regulation establishes requirements for an SMS, including Safety Management Policy, **Safety Risk Management (SRM)**, **Safety Assurance (SA)**, and Safety Promotion



https://www.transit.dot.gov/PTASP-TAC

Safety Risk Mitigations

Safety risk mitigations generally reduce either the likelihood or severity of the potential consequence of a hazard

Example Safety Risk Assessment Chart			
***Likelihood**/Severity*	Catastrophic (1)	Serious (2)	Marginal (3)
Frequent (A)	High (1A)	High (2A)	Medium (3A)
Occasional (B)	High (1B)	Medium (2B)	Low (3B)
Remote (C)	High (1C)	Medium (2C)	Low (3C)

A safety risk mitigation may reduce the likelihood of the potential consequence of a hazard, such as reducing the likelihood from frequent to occasional, or occasional to remote

Safety Risk Mitigations

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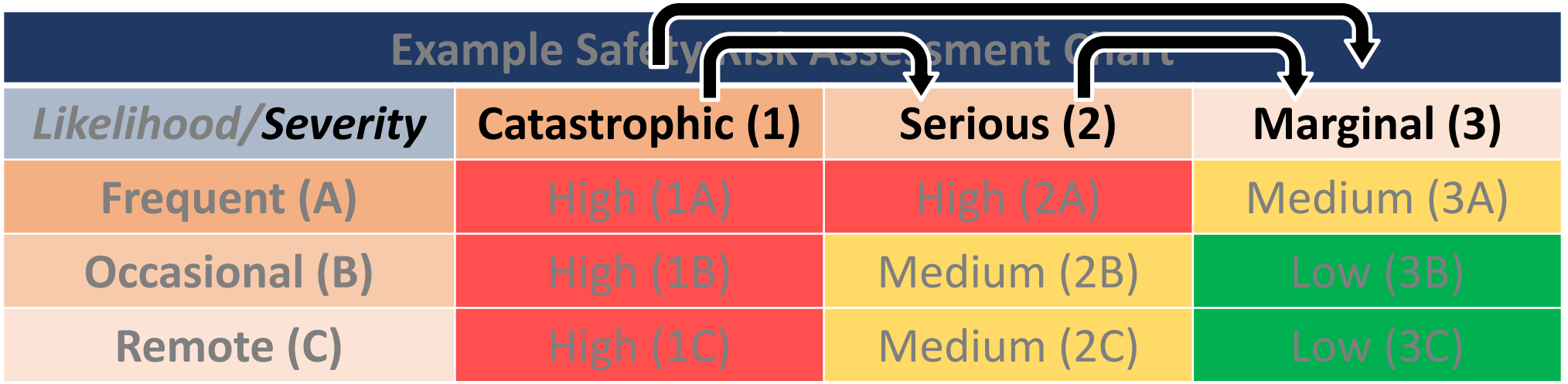

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Remote (C)	High (1C)	Medium (2C)	Low (3C)

A safety risk mitigation may reduce the severity of the potential consequence of a hazard, such as reducing the severity from catastrophic to serious, or serious to marginal

Safety Risk Mitigations

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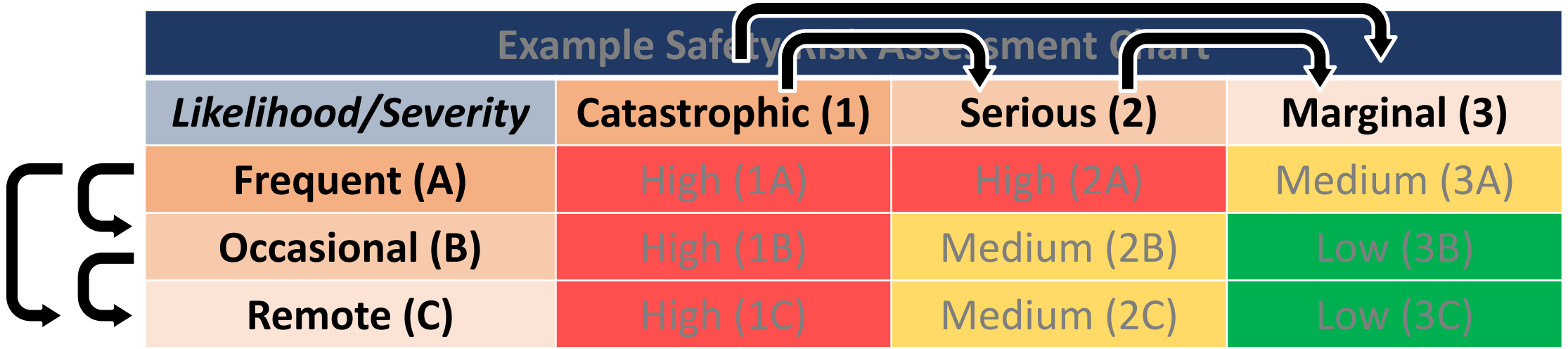

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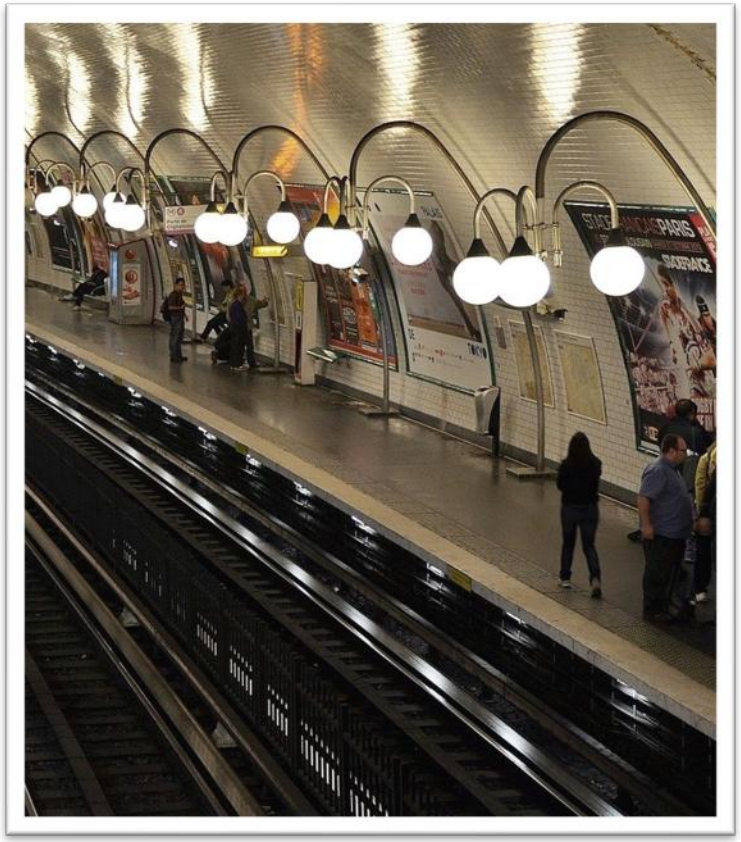
A safety risk mitigation may reduce both the likelihood and the severity of the potential consequence of a hazard

Safety Risk Mitigations

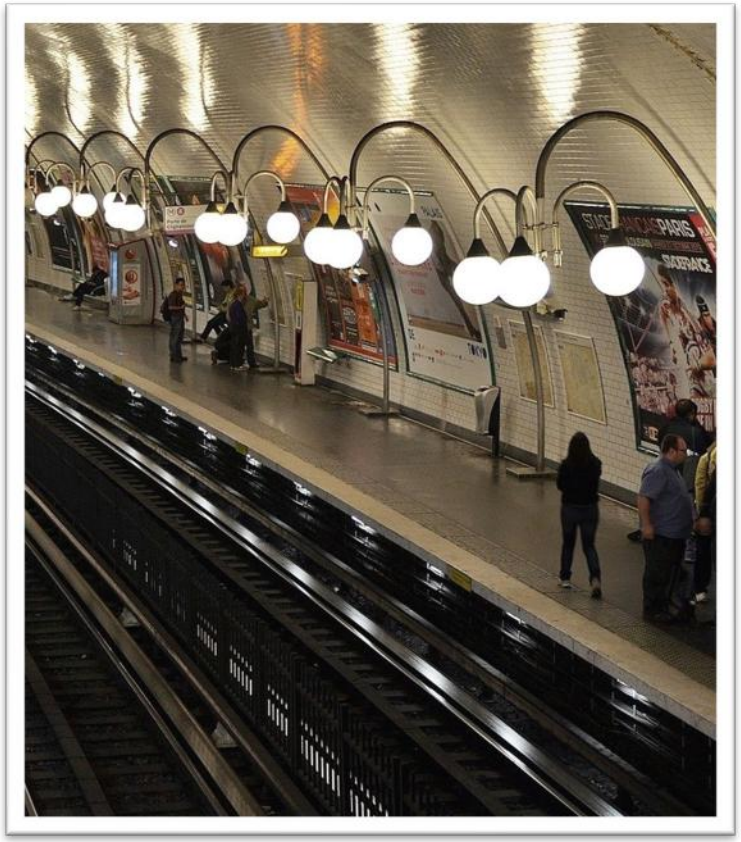


Example:

A rail transit agency determines that the risk associated with falls on an open platform is not adequately mitigated

What are some example mitigations?

Safety Risk Mitigations



Example:

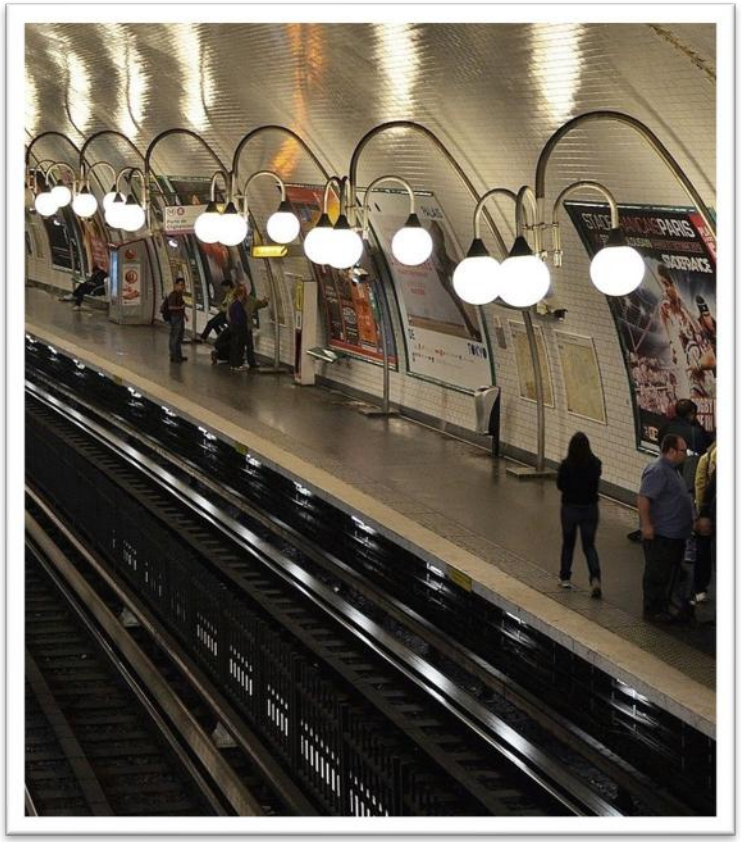
A rail transit agency determines that the risk associated with falls on an open platform is not adequately mitigated

Example Mitigation:

Increase platform monitoring by assigning personnel, such as station agents or transit police or security officers, to warn individuals to stay back from the platform edge

This mitigation reduces the ***likelihood*** of the potential consequence of the hazard

Safety Risk Mitigations



Example:

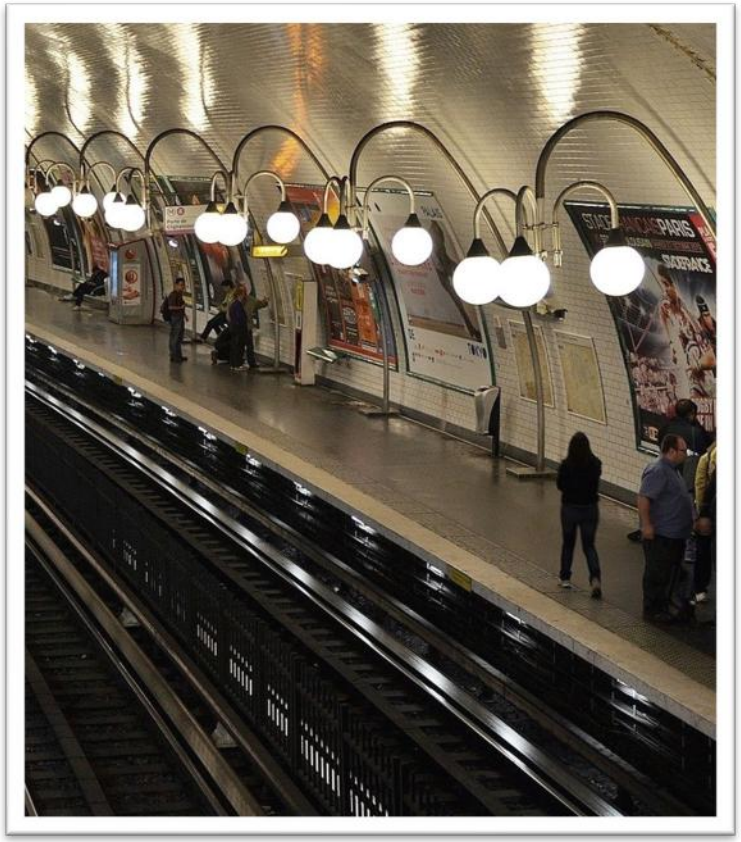
A rail transit agency determines that the risk associated with falls on an open platform is not adequately mitigated

Example Mitigation:

Install sensors that feed into the Operations Control Center to alert controllers to stop trains on approach to the station when someone has fallen on the right-of-way

This mitigation reduces the ***severity*** of the potential consequence of the hazard

Safety Risk Mitigations



Example:

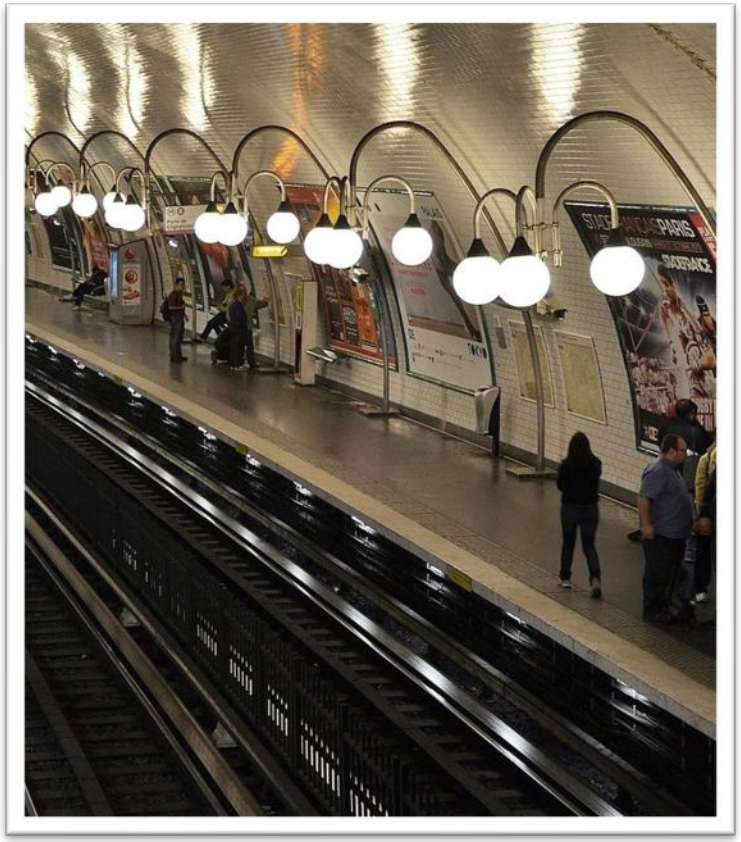
A rail transit agency determines that the risk associated with falls on an open platform is not adequately mitigated

Example Mitigation:

Install platform screens that prevent passengers from falling to the right-way when the screens are closed

This mitigation reduces both the ***likelihood*** and the ***severity*** of the potential consequence of the hazard

Safety Risk Mitigations



Reduce ***likelihood***

Reduce ***severity***

Reduce ***likelihood*** and ***severity***

Eliminate ***risk***

Developing Safety Risk Mitigations

When deciding on a safety risk mitigation

- An agency may not be able to make a consequence less likely, but they may be able to make it less severe
- An agency may only be able to reduce the likelihood of the consequence

Deciding on a mitigation may come down to a practical decision

- Is it more practical/cost effective to reduce the likelihood or the severity?

What will our safety risk mitigation achieve?

Reduce ***likelihood***

Reduce ***severity***

Reduce ***likelihood*** and ***severity***

Eliminate ***risk***

Developing Safety Risk Mitigations

One mitigation may impact the safety risk associated with another hazard

- A mitigation may increase the safety risk associated with another hazard

What will our safety risk mitigation achieve?

- Reduce ***likelihood***
- Reduce ***severity***
- Reduce ***likelihood*** and ***severity***
- Eliminate ***risk***

Developing Safety Risk Mitigations

Example:

Reducing maximum authorized speeds when approaching intersection

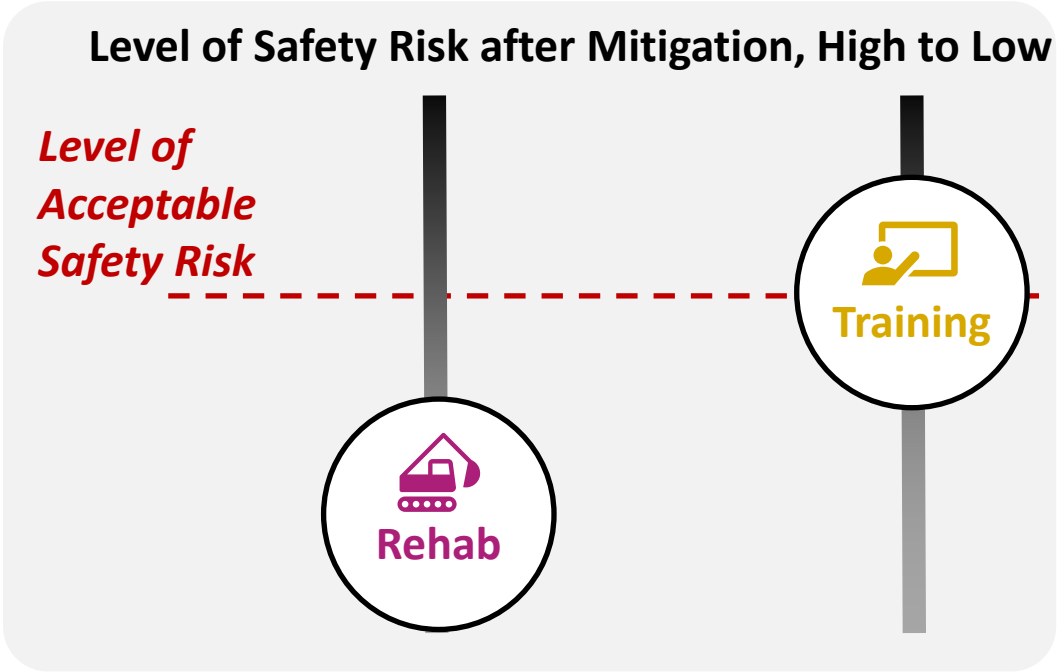
- Provides operators more time to visually assess the road and to identify and react to potential situations, potentially reducing the likelihood of a collision with a pedestrian or bicyclist
- However, slowing transit service also may lead to crowding on transit vehicles that increases the potential for passenger boarding and alighting injuries

Deciding on a Safety Risk Mitigation

Some Safety Risk Mitigations may be more effective than others

When deciding on a mitigation strategy, consider whether the mitigation will lower the safety risk to a level acceptable by the agency

- For example, a “hard” mitigation, such as rehabilitating a station to eliminate a sightline obstruction may be more effective than training operators to approach at a low speed

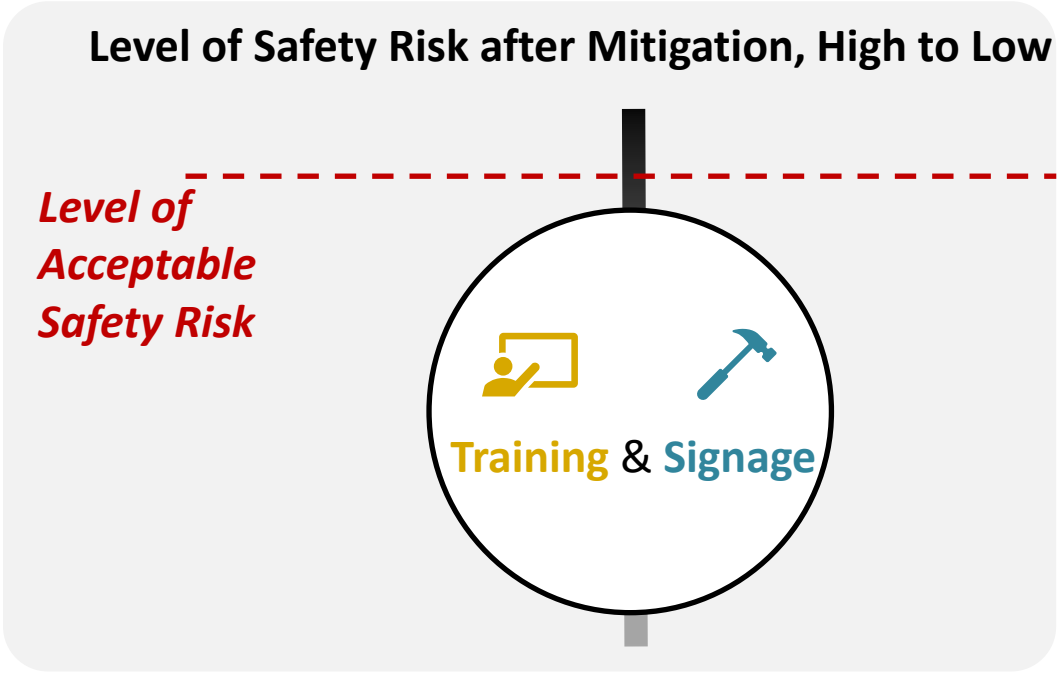


Deciding on a Safety Risk Mitigation

Some Safety Risk Mitigations may be more effective than others

When deciding on a mitigation strategy, consider whether the mitigation will lower the safety risk to a level acceptable by the agency

- In some cases, multiple mitigations may be applied to lower the level of safety risk to a level acceptable by the transit agency
- For example, a combination of operator training and signs warning pedestrians of limited sightlines



Subject Matter Expertise

Subject matter experts can help agencies identify effective safety risk mitigations

- Leverage experience in identifying potential mitigations
- Provide valuable insight and ensure that your proposed mitigation does not unintentionally create new hazards or worsen existing hazards

Audience Poll

Which, if any, of the below does your agency use to identify safety risk mitigations? *Select all that apply.*

36% Safety Department

27% Operations Subject Matter Experts

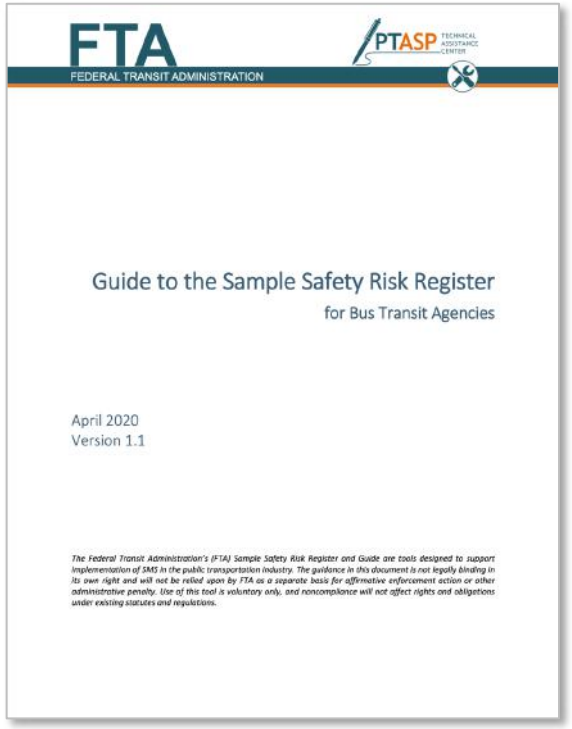
21% Research into industry practices

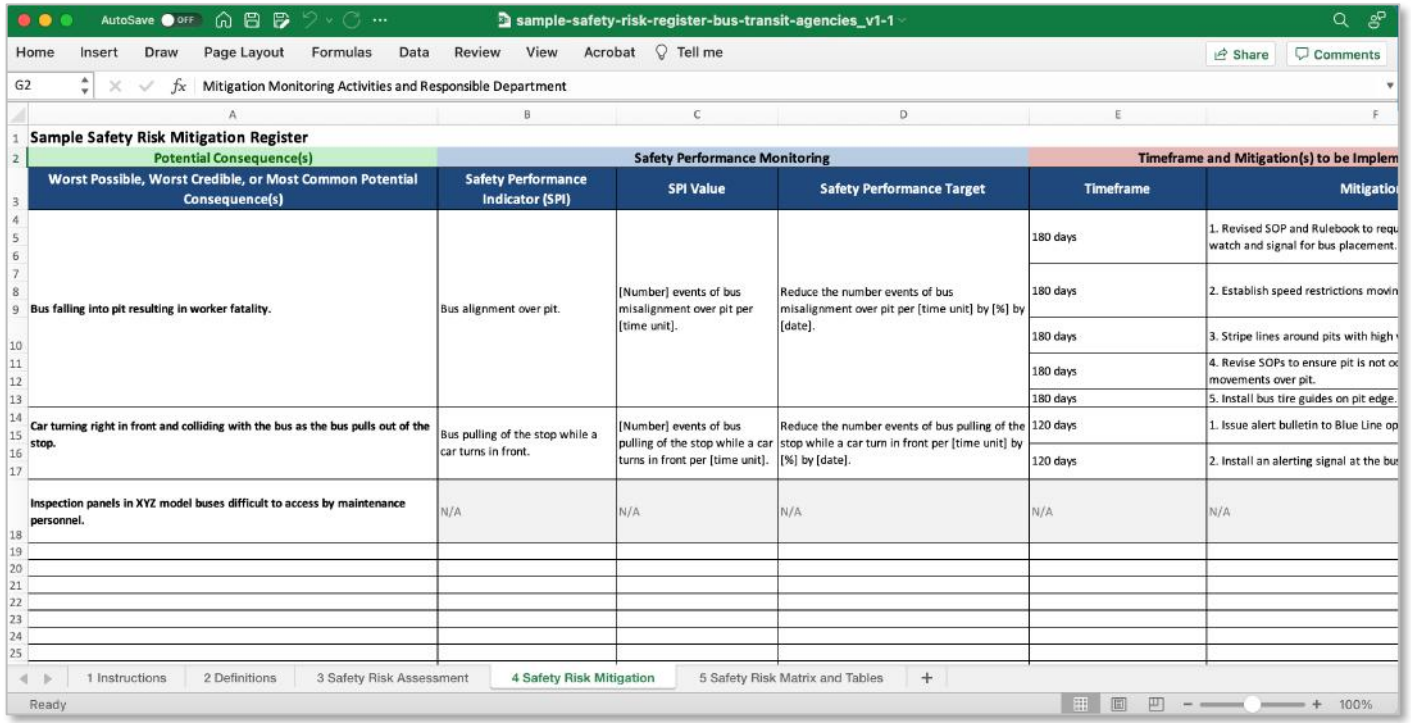
16% External Subject Matter Experts

Documenting Mitigations

How do I document mitigations?

- FTA does not specify how agencies must document their mitigations
- What documentation looks like is up to each agency





FTA's Sample Safety Risk Register

How do I document mitigations?

Items to consider documenting:

Hazard and Potential Consequence(s)	Safety Risk Rating	Implementation	Safety Performance Monitoring
• Hazard • Hazard Type • Identification Date • Potential Consequence • Existing Mitigations	• Safety Risk Rating before mitigation • Revised Safety Risk Rating (following mitigation)	• Implementation lead • Department responsible • Implementation timeframe/schedule	• Measures to determine whether the mitigation is effective, implemented as intended, and appropriate

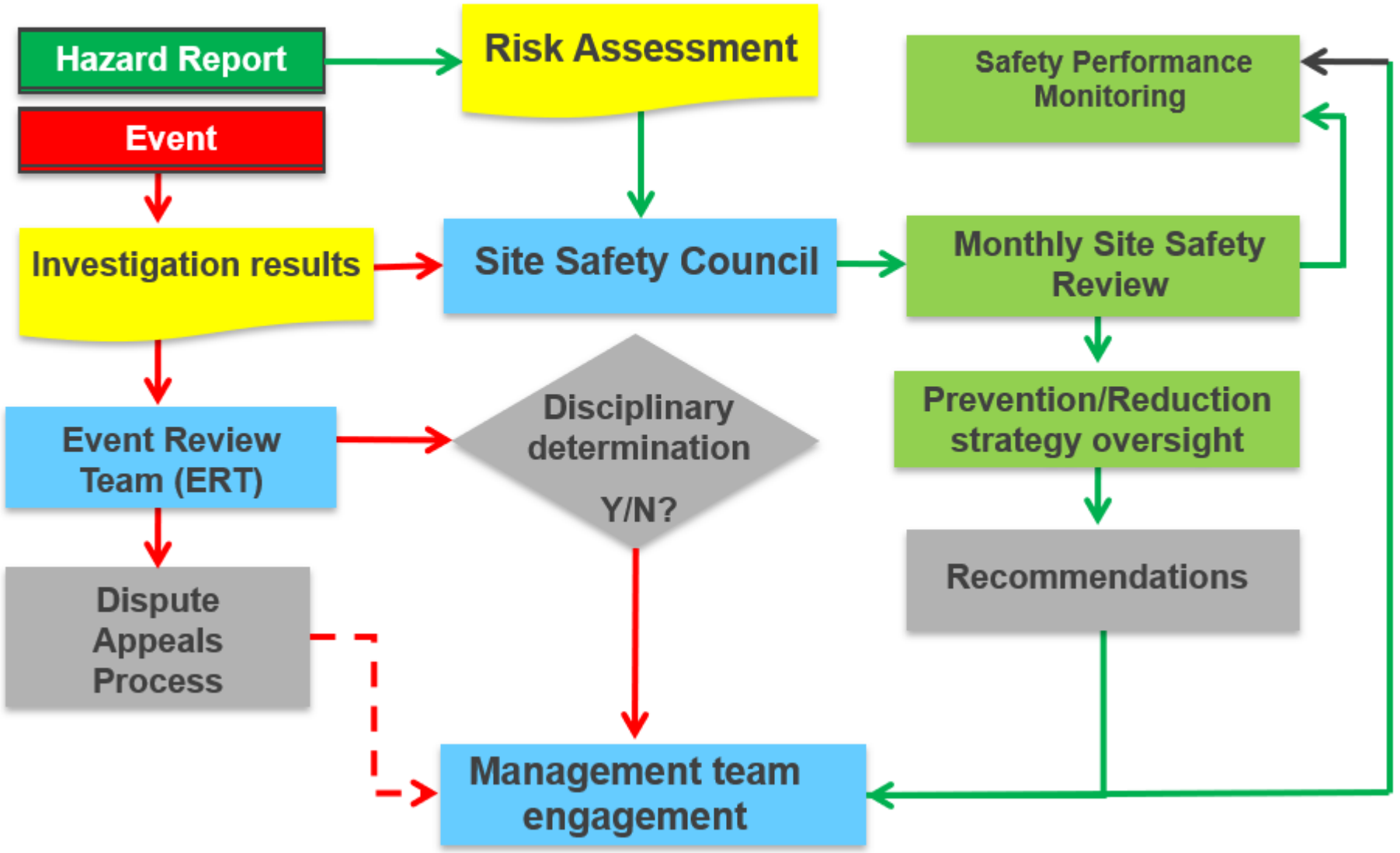
Guest Speaker

Serena Stevenson
General Manager
Waco Area Transit

Characteristics and Service

- Waco Transit System is a small urban provider that operates motor bus and demand response. We operate nine Fixed Routes, two Downtown Waco Shuttles, complementary Paratransit and Evening Link services, Monday-Saturday.
- Waco Transit System operates seven shuttles for the BUS-Baylor University Service, Monday-Friday, and two of those shuttles run on Saturday and Sunday as well.
- Waco Transit System maintains its on vehicles.
- Waco Transit System's downtown transfer center, is an intermodal facility, and is under lease by FlixBus/Greyhound for inter-city bus service.
- Waco Transit System contracts (5310) purchase of service.
- Waco Transit System provides (5311) Rural services under an interlocal agreement between the City of Waco and McLennan County.

Waco Transit System PROCESS



Waco Transit System FY 2022 Year To Date Safety Data and Trends

Targets	Waco FY22 - YTD as of March	MWA ☒ select Fixed	Para	Rail	YTD	FY21 AFR/IFR	FY21 ZONE	FY22 Zone Goal	Fixed	Para	Rail	FY22 YTD	FY22 (+/-)	AFR/IFR YTD	FY22 ZONE	Target Status
1	Total Collision	19	15	0	34	1.83	1	1	10	13	0	23	(17)	0.00	0	On ZONE
2	Passenger Injuries	7	4	0	11	0.38	0	0	0	0	0	0	0	0.00	0	On ZONE
3	Employee Injuries	5	9	0	14	14.23	6	4	1	1	0	2	0	0.00	0	On ZONE
4	Lost Time Injuries	3	7	0	10	10.17	6	4	1	1	0	2	(0)	0.00	0	On ZONE
	PrevCollisions	13	9	0	22	1.18	0	0	6	3	0	9	(5)	0.00	0	On ZONE
	Pedestrian / Bike Strike	0	1	0	1	0.05	0	0	0	0	0	0	0	0.00	0	On ZONE

FY22 ZONE GOAL

FY21	ZONE RATING	Improve By	FY22 GOAL
0	Excellance	Flat	0
1	Zone 1		1
2	Zone 2	1	1
3	Zone 3	1	2
4	Zone 4	1	3
5	Zone 5	1	4
6	Beyond Tolerance	2	4

YTD SAFETY TRENDS COLLISION CAUSES	Waco 2021	%	2022	%
Improper Backing	3	13%	3	23%
Hit Fixed Object	6	25%	4	31%
Hit Parked Vehicle	3	13%	3	23%
Intersection	1	4%	0	0%
Read End	2	8%	0	0%
Pedestrian/Cyclist	1	4%	0	0%
Sideswipe	3	13%	1	8%
Improper Turning	2	8%	0	0%
All Other	3	13%	2	15%
	24	100%	13	100%

YTD SAFETY TRENDS INJURY CAUSES	PrevCollisions 2021	%	2022	%
Slip, Trip, Fall	3	21%	1	50%
Improper lifting	0	0%	0	0%
Push, Pull, Twist	0	0%	0	0%
Collision	1	7%	1	50%
Cut/laceration/puncture	1	7%	0	0%
Occupational injury	0	0%	0	0%
Assault	0	0%	0	0%
All Other	9	64%	0	0%
	14	100%	2	100%

Audience Poll

How does your agency document your mitigations? *Select all that apply.*

38% Other

36% Excel or other data processor

14% Safety Risk Register

12% Specialized software

Mitigation Monitoring Methods

Monitoring Mitigations

Under **Safety Assurance (SA)**, transit agencies are required to monitor operations to identify safety risk mitigations that may be:

- Ineffective
- Inappropriate
- Not implemented as intended

Monitoring Mitigations

One way transit agencies could monitor safety risk mitigations is to establish safety performance indicators (SPIs) and safety performance targets (SPTs) for the mitigation

- Define the data you will watch to in order to know if a mitigation is working

An ***SPI*** is a signal or early warning sign that measures inputs, outputs, outcomes, or impacts of a particular process or activity

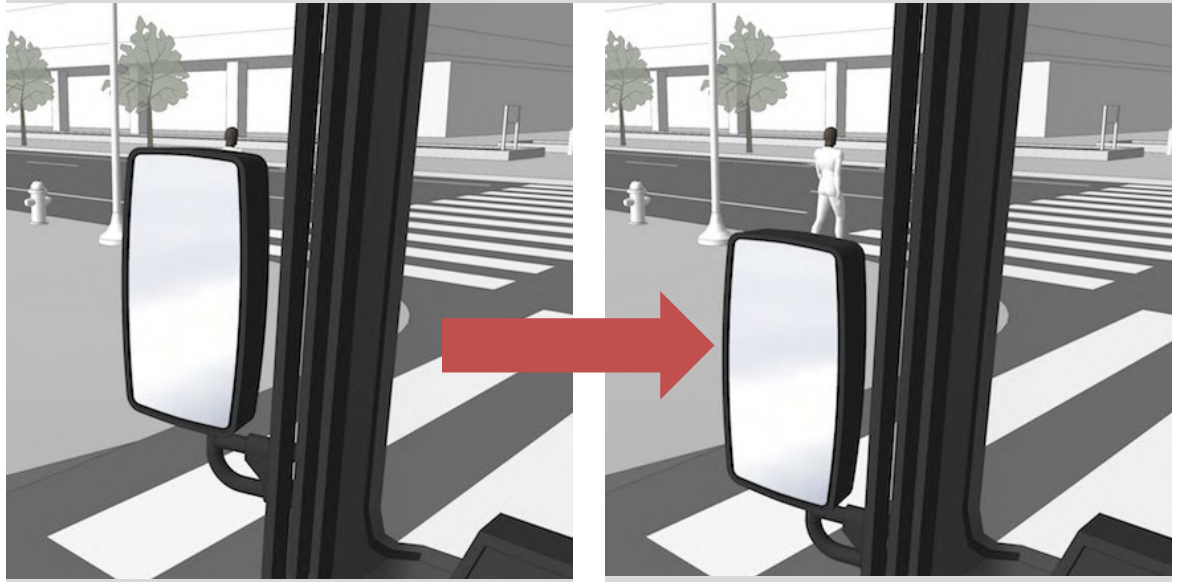
Number of passenger injuries from slip/fall events on vehicles per vehicle revenue mile

SPTs apply quantitative thresholds to draw conclusions from observed changes in an SPI over a specific timeframe compared to the expected change

Reduce the number of passenger injuries from slip/fall events on vehicles per vehicle revenue mile by 10% over the next 12 months

Monitoring Mitigations

Safety risk mitigation: 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

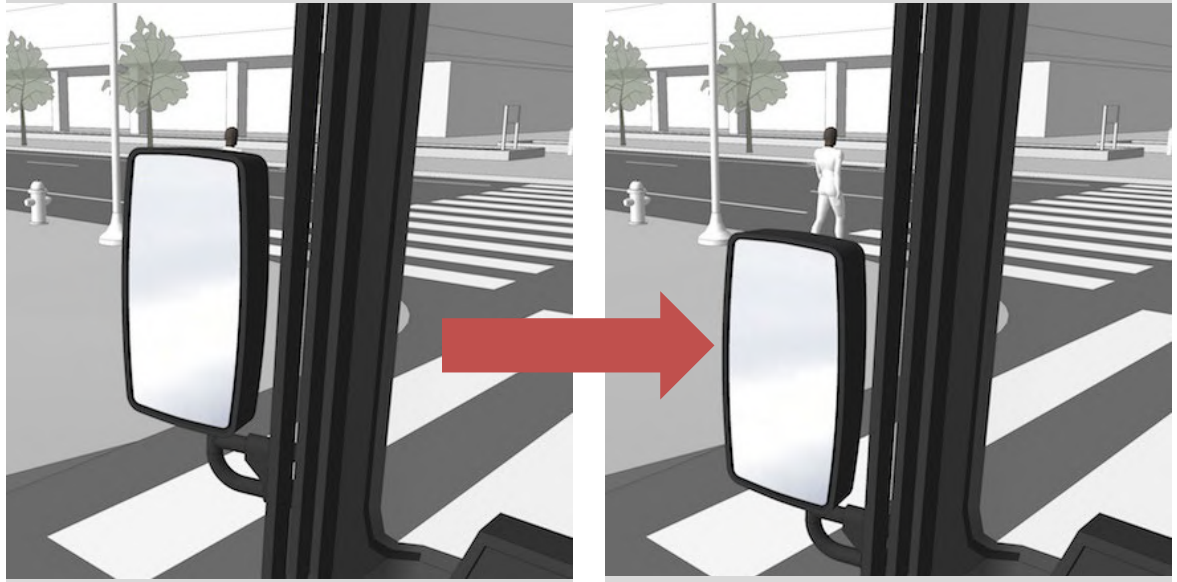
<u>Example SPIs and SPTs:</u>

Effectiveness

- SPI: Number of collisions with pedestrians during left-hand turns
- SPT: Zero collisions with pedestrians during left-hand turns over the next six months

Monitoring Mitigations

Safety risk mitigation: bus mirror is moved to reduce visual obstruction



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

<u>Example SPIs and SPTs:</u>

Implementation

- SPI: Percentage of mirrors adjusted
- SPT: 100-percent implementation 30-days after issuing maintenance instruction

Monitoring Mitigations

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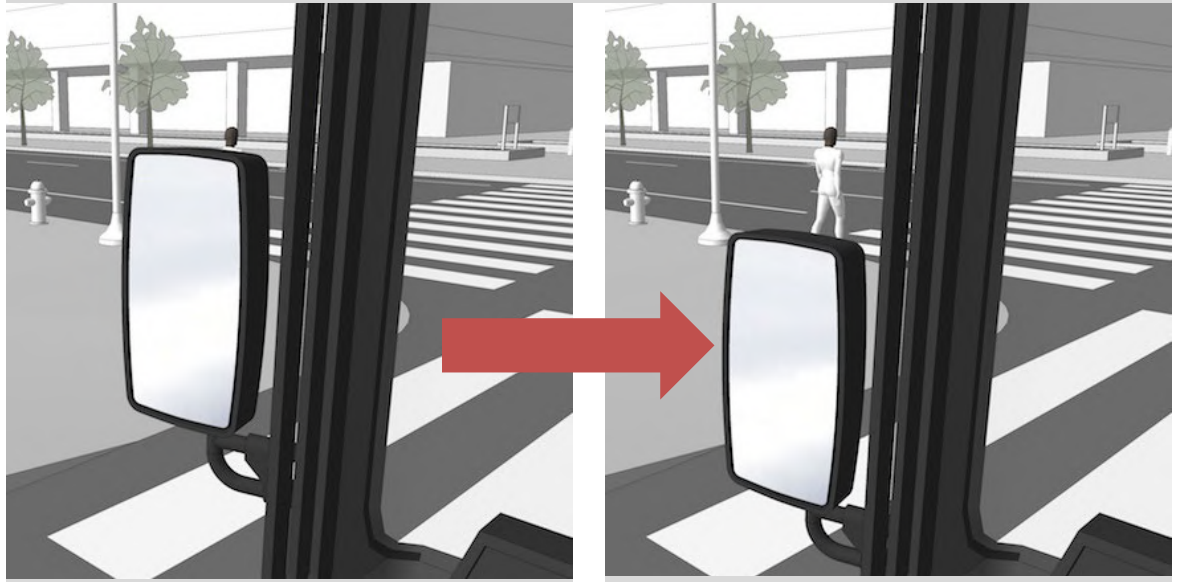

Mirror obstructs the operator's view of pedestrians during left-hand turns

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

Example SPIs and SPTs:

Effectiveness

- SPI: Number of operator reports about mirrors blocking line-of-sight
- SPT: Reduction of over 75% of reports over the next six months

Mitigation Monitoring Plan

Mitigation Description	**Move bus mirrors to reduce visual obstruction**
Implementation Roles and Responsibilities	**Maintenance Department; Susan Smith**
Defined SPIs and SPTs	• **<u>Effectiveness:</u> Zero collisions with pedestrians during left-hand turns over the next six months;** • **<u>Implementation:</u> 100% implementation by 30 days after issuing maintenance instruction**
Implementation Timeframes	**Completion within 30 days of maintenance instruction**
How agency will report on safety performance	**Monthly report provided by the safety department to the safety committee**

Guest Speaker

Seth Page
Safety Manager
Greater Portland Metro

Related Resources

- Today's webinar focused on topics in Safety Risk Management (SRM), and Safety Assurance (SA)
- Log onto FTA's PTASP TAC Resource Library for more webinars, tools, and fact sheets related to SRM and SA

www.transit.dot.gov/PTASP-TAC

For information related to the Bipartisan Infrastructure Law, visit www.transit.dot.gov/BIL

Contact FTA-IIJA@dot.gov with your questions related to the Bipartisan Infrastructure Law

PTASP Technical Assistance Center

Welcome to the Public Transportation Agency Safety Plan (PTASP) Technical Assistance Center (TAC). We are here to help you meet PTASP regulation requirements.

For information on Bipartisan Infrastructure Law safety requirements, see FTA's web page or email FTA-IIJA@dot.gov .

PTASP Resource Library

Choose your agency type to begin

Small Bus Transit Provider

Bus Transit Provider

Rail Transit Provider

State Department of Transportation

State Safety Oversight Agency

Metropolitan Planning Organization

https://www.transit.dot.gov/PTASP-TAC

Bus Transit Providers

FTA developed a host of materials to help large bus transit providers develop Agency Safety Plans.

- Applicability
- Plan Development
- Certification
- Safety Performance Targets
- Safety Management Policy
- Safety Risk Management
- Safety Assurance
- Safety Promotion
- Implementation
- SMS Records and Documentation
- Annual ASP Review

https://www.transit.dot.gov/PTASP-TAC

Safety Risk Management

Fact Sheets

- Guide to Developing the Safety Risk Management Component of a Public Transportation Agency Safety Plan
- Addressing Operator Assault through a Safety Management System

Guidance

- Sample Hazard Classification System
- Hazard Management vs. Safety Risk Management Guide
- Potential Sources of Hazard Information for Bus Transit Operations

Tools

- Sample Safety Risk Assessment Matrices for Bus Transit Agencies
- Guide to the Sample Safety Risk Register for Bus Transit Agencies
  - Sample Safety Risk Register for Bus Transit Agencies

Training

- PTASP Hazards and Consequences Self Guided Learning Tool

Webinars

- Safety Risk Assessment in Practice: April 27, 2022
  Webinar Presentation | Webinar Recording
- Implementing Safety Risk Assessment Approaches: Thursday, June 30, 2021
  - Webinar Presentation

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Safety Assurance

Fact Sheets

- SMS Techniques for Monitoring Operations and Maintenance Procedures
- Guide to Developing the Safety Assurance Component of a Public Transportation Agency Safety Plan
- Monitoring Compliance and Sufficiency of Operations and Maintenance Procedures
- Lessons Learned from Voluntary Agency Safety Plan Reviews (Part 2)

Guidance

- Introduction to Safety Performance Indicators and Targets

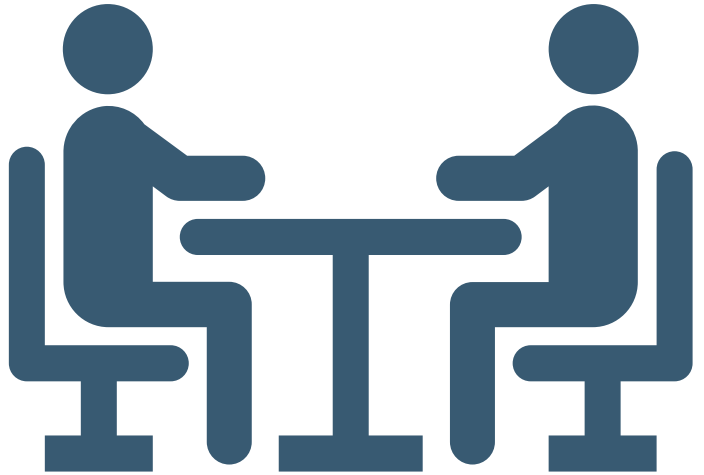
Webinars

- SMS Techniques for Monitoring Operations and Maintenance Procedures: February 24, 2022
  - Webinar Presentation | Webinar Recording
- Safety Event Investigation in an SMS: Wednesday, July 28, 2021
  - Webinar Presentation | Webinar Recording
- Safety Assurance: Thursday, July 11, 2019
  - Webinar Presentation | Webinar Recording
- Safety Assurance Agency Safety Plan Section Lessons Learned: Thursday, March 26, 2020
  - Webinar Presentation | Webinar Recording
- Management of Change: Thursday, August 27, 2020
  - Webinar Presentation | Webinar Recording
- Compliance Monitoring Webinar: Wednesday, September 16, 2020

https://www.transit.dot.gov/PTASP-TAC

Technical Assistance

- **TAC Website** transit.dot.gov/PTASP-TAC
- **FAQs** transit.dot.gov/PTASP-FAQs



The TAC help desk is available to assist the transit industry with PTASP questions, including questions about ASP development and implementation:

- **Email** PTASP-TAC@dot.gov

PTASP TECHNICAL ASSISTANCE CENTER

Questions and Answers

- Question and Answer session on safety risk mitigations

- For information related to the Bipartisan Infrastructure Law
  - Please visit FTA's Bipartisan Infrastructure Law webpage
  - Review FTA's March 1, 2022 Bipartisan Infrastructure Law webinar
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