



FEDERAL TRANSIT ADMINISTRATION

Implementing Safety Risk Assessment Approaches

June 30, 2021



FEDERAL TRANSIT ADMINISTRATION

Webinar Objectives

- Discuss requirements for safety risk assessment
- Discuss and provide considerations for implementing safety risk assessment approaches

Agenda

- Public Transportation Agency Safety Plan (PTASP) regulatory requirement for safety risk assessment
- Considerations for carrying out safety risk assessment approaches
- Transit agency presentations
- Q&A

Icon Legend



This slide contains PTASP requirements!



There are resources about this topic in the PTASP Resource Library.

PTASP REQUIREMENT FOR SAFETY RISK ASSESSMENT



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Safety Management Systems (SMS)

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



Three Sub-Components of SRM



SAFETY RISK MANAGEMENT DEFINITIONS



Risk

- A **measure** of severity and likelihood, combined
- **Predicted**—in the future; hasn't happened yet
- Measures the **potential effects** of a hazard, not the hazard itself
- Likelihood (**how often**) vs. severity (**how bad**)

§ 673.5 Definitions

Risk means the composite of predicted severity and likelihood of the potential effect of a hazard

- **Avoid confusing** risk with hazard
 - We often call something “a safety risk” when we mean “a hazard”



Hazard

- **Real or potential** condition—not an event
 - **Real:** Observable condition that exists in the transit system
 - **Potential:** Condition that doesn't exist, but could exist if a change is made in the transit system
- **Can cause** consequences

§ 673.5 Definitions

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



Consequence

- Important to **distinguish hazards from consequences** for accurate safety risk assessment
- Potential consequences are **the focus of safety risk assessment**
 - Assess the **severity and likelihood of potential consequences, not hazards**
- A single hazard could cause multiple consequences

Not defined in § 673.5, but can be derived from the definition of *Hazard*. Transit agencies may choose to use the following definition:

Consequence means an effect of a hazard, involving injury, illness, or death; damage to or loss of the facilities, equipment, rolling stock, or infrastructure of a public transportation system; or damage to the environment



Event

- **Something that happened**, not a condition or system state
- Important to distinguish from a hazard
- Safety event investigation may reveal hazards

§ 673.5 Definitions

Event means any accident, incident, or occurrence

- Used primarily for reporting, not SRM
 - Event definitions are based on type of event and magnitude of outcomes



FTA Resource

- [FTA's Hazards and Consequences Self-Guided Learning Tool](#) helps individuals distinguish between hazards and consequences in SRM in SMS
- FTA's [PTASP Bus Workshop Participant Guide](#) covers this in greater detail (version 5, pages 25-34)

SAFETY RISK ASSESSMENT

Three Sub-Components of SRM





Safety Risk Assessment

- Must **assess likelihood and severity** of the consequences of hazards
 - Must include existing mitigations
- Must **prioritize hazards based on the safety risk** of their potential consequences
- Consider how your agency will **select or prioritize** hazards and potential consequences **to undergo safety risk assessment**

§ 673.25

- c) Safety risk assessment
 - 1) A transit agency must **establish methods or processes to assess safety risks** associated with identified safety hazards
 - 2) A safety risk assessment includes an assessment of the likelihood and severity of the consequences of the hazards, including existing mitigations, and prioritization of the hazards based on the safety risk





Definitions: Safety Risk Assessment

- **Likelihood:** A predicted measure of how often something could occur – how often a *consequence* could occur
- **Severity:** How bad something could be – how bad a *consequence* could be
- **Safety risk:** The combined predicted likelihood and severity of the potential effect of a hazard – remember, that's the consequence! (§ 673.5)



Sample Safety Risk Assessment Matrices



See FTA's [Sample Safety Risk Assessment Matrices for Bus Transit Agencies](#) for more information on the Safety Risk Assessment process



Safety Risk Management in the SMS

Inputs

Safety Promotion (employee safety reports)
Safety Assurance (accident investigations, safety performance monitoring activities)

Inputs

Safety Assurance (accident investigations, safety performance monitoring activities)

Safety Hazard Identification

Safety Risk Assessment

Safety Risk Mitigation

Outputs

Safety Promotion (responses to employee safety reports)
Safety Assurance (safety risk mitigation monitoring)

CONDUCTING SAFETY RISK ASSESSMENT



Breaking Down Safety Risk Assessment

Safety Hazard Identification

Identify hazards and
their associated
potential
consequences

Safety Risk Assessment

Determine likelihood
and severity of the
potential consequence
of the hazard

Managing the Outputs of the Safety Hazard Identification Process

- Transit agencies will likely identify hundreds of safety hazards
 - May choose not to assess every safety hazard identified
- Transit agencies may assign authority, accountability, and responsibility for determining which safety hazards to assess
- For example, a transit agency may:
 - **Authorize** the CSO to determine which safety hazards to assess
 - Hold the Accountable Executive **accountable** for the decisions the CSO makes on determining which safety hazards to assess
 - Allow the CSO to assign **responsibility** for determining which safety hazards to assess to subject matter experts throughout the agency, such as using engineering staff to determine whether certain engineering-related hazards must be assessed

Using the Outputs of Safety Hazard Identification for Safety Risk Assessment

- ASPs describe:
 - A process for identifying hazards and their potential consequences
 - A process for assessing the safety risk of potential consequences
- **Your ASP might not describe how these processes are linked**—how your agency moves identified hazards and their potential consequences into the safety risk assessment phase of SRM

Using the Outputs of Safety Hazard Identification for Safety Risk Assessment



- Some agencies choose to use a safety risk register to document their SRM activities—this can be helpful to ensure a link between safety hazard identification and safety risk assessment
- See FTA’s [sample safety risk assessment register](#) and accompanying [guide](#) for more information on safety risk registers

Sample Safety Risk Assessment Register						
Identification						
Hazard	Hazard Type	Identification Date	Identification Source	Analysis Date	Worst Possible, Worst Credible, or Most Common Potential Consequence(s)	Existing Mitigation(s)
Buses misaligned over pits.	Technical - Maintenance	5/6/21	Employee safety reporting	05/21/21	Bus falling into pit resulting in worker fatality.	1. Training in aligning the bus properly over pit. 2. SOP and rule book provided with training.

Using the Outputs of Safety Hazard Identification for Safety Risk Assessment

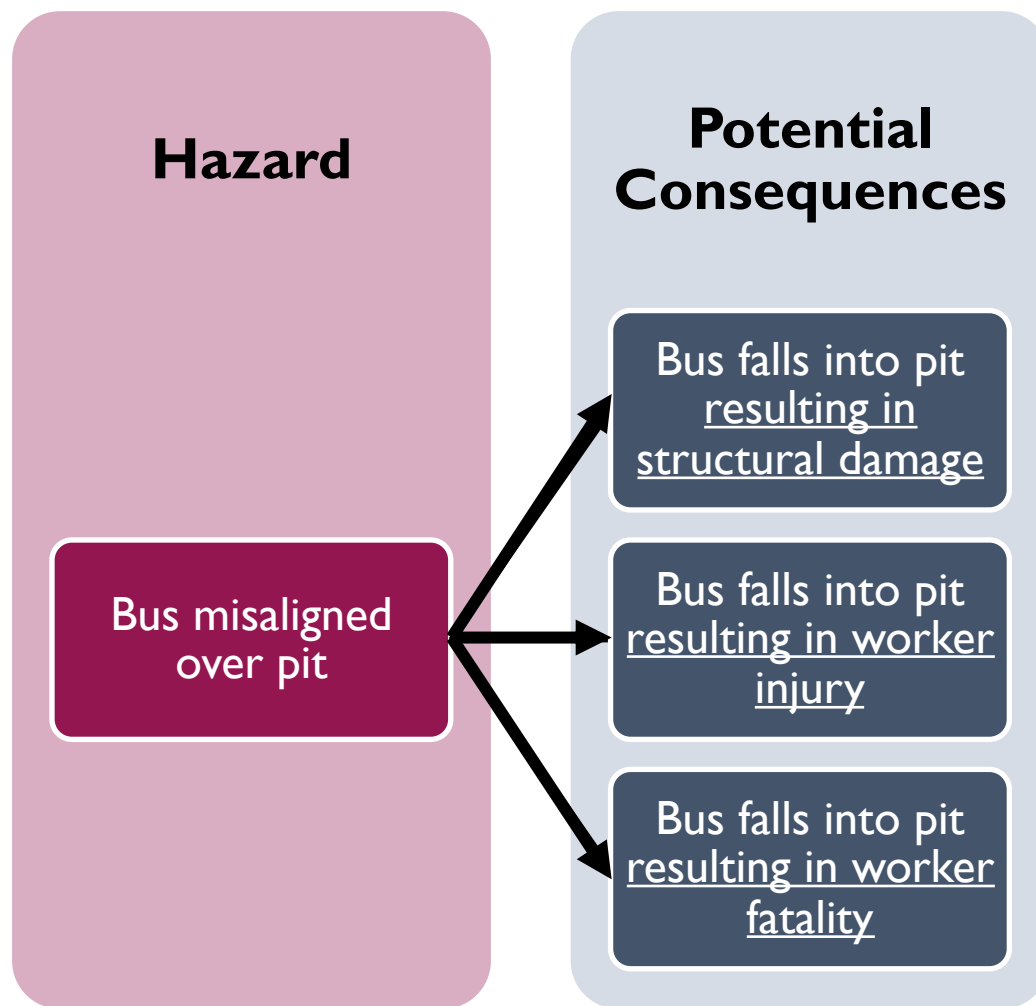
- Hazards often have more than one potential consequence
 - Your agency does not have to assess the safety risk of each potential consequence
- Consider developing a **process for determining *which* potential consequence to assess** through safety risk assessment, if your agency doesn't have one already

Using the Outputs of Safety Hazard Identification for Safety Risk Assessment

Common approaches to determining which potential consequence to assess under Safety Risk Assessment include:

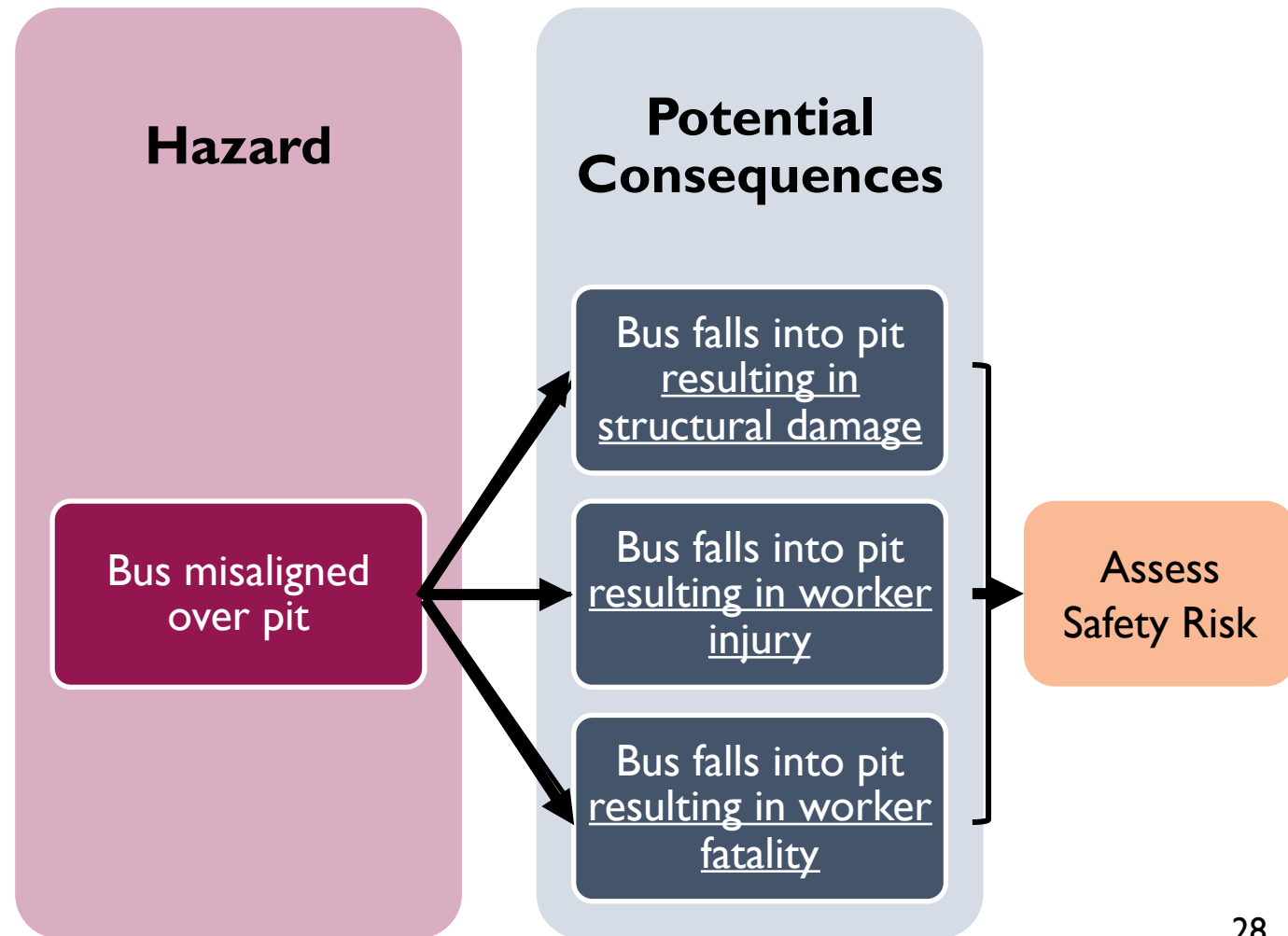
- Assessing **all** potential consequences associated with the hazard
- Assessing the **most likely** potential consequence
- Assessing the **worst** potential consequence
- Assessing the **worst credible** potential consequence

Hazards and Potential Consequences in Safety Risk Assessment



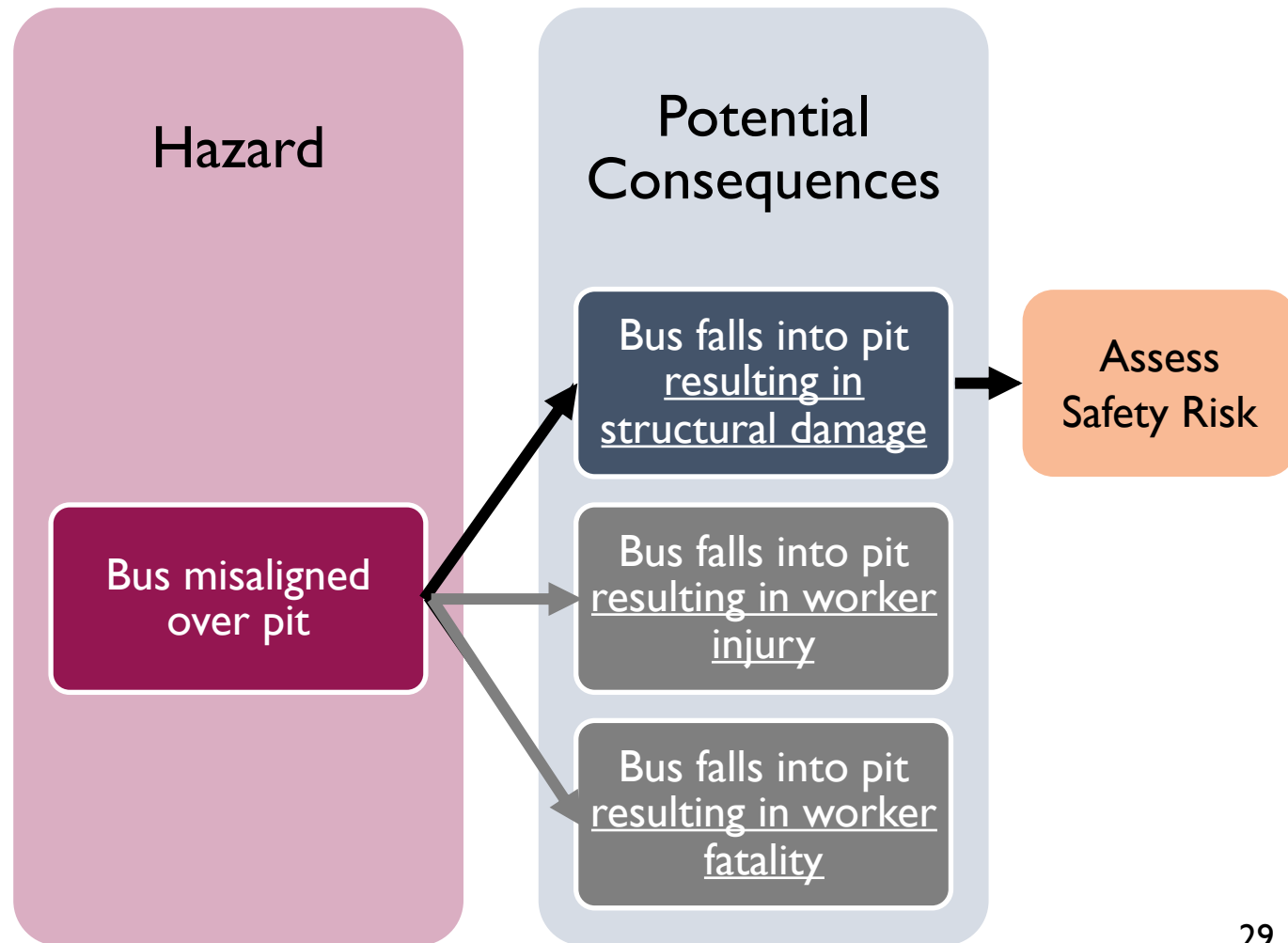
Potential Consequences and Safety Risk Assessment

Your agency may choose to assess the safety risk of **all potential consequences** associated with the hazard



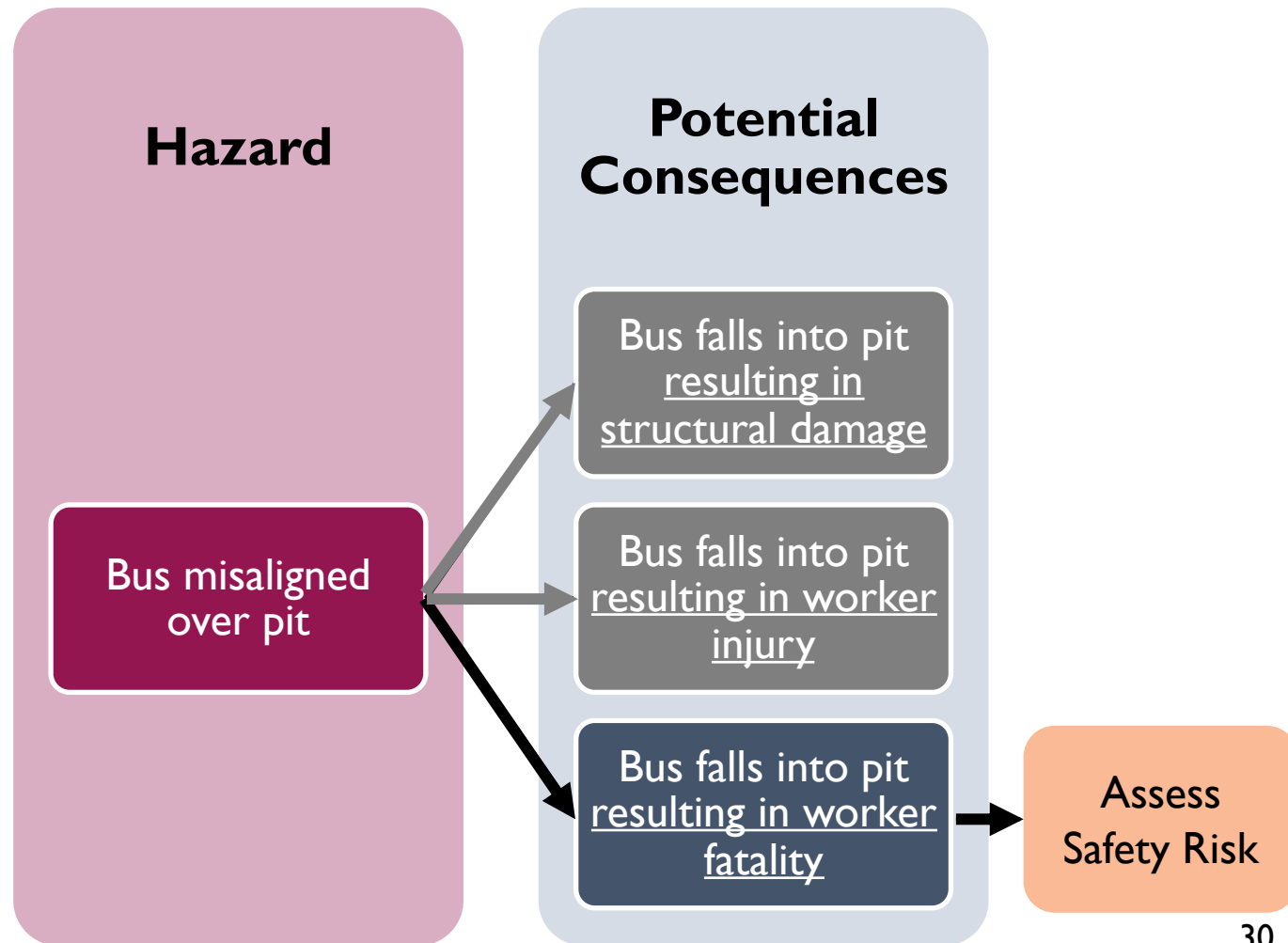
Potential Consequences and Safety Risk Assessment

- Your agency may choose to assess the safety risk of the **most likely potential consequence**
- Consider what data your agency has available to determine the most likely possible consequence



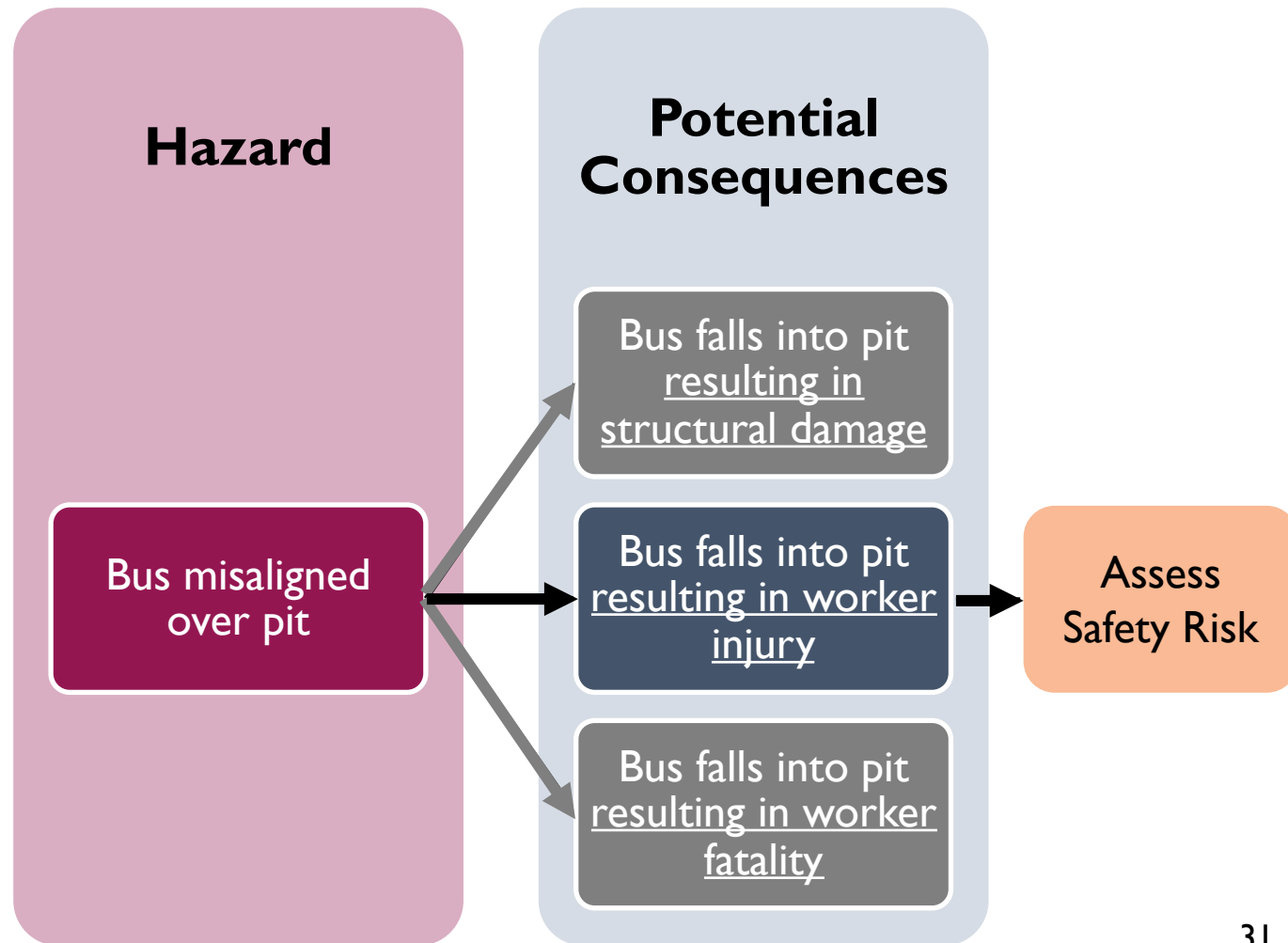
Potential Consequences and Safety Risk Assessment

- Your agency may choose to assess the safety risk of the **worst potential consequence**
- *Worst potential consequence* means the most severe outcome



Potential Consequences and Safety Risk Assessment

Your agency may choose to assess the safety risk of the **worst credible potential consequence**



Assessing...	PROS	CONS
All potential consequences	Reassurance that the agency accounted for all possible outcomes	Requires more time to complete (resources)
Most likely potential consequence	May help conserve resources (time) if the other potential consequences are highly unlikely to occur	May not address more severe consequences that, while less likely, are of greater concern to the agency
Worst potential consequence	May help reduce the severity or likelihood of the most severe potential consequence	May not address less severe, but more likely potential consequences
Worst credible potential consequence	May help the agency address the most severe consequence that is likely to occur	May not address less severe, but more likely potential consequences or more severe, but less likely potential consequences

Determining Which Approach to Use

- Remember, your agency does not have to use one approach for every hazard
 - You can choose to assess the safety risk of the most likely potential consequence for one hazard, the worst potential consequence for another, etc.
 - Your agency may authorize the CSO or another individual to decide which approach to use for each hazard
 - Your agency may also use a committee of subject matter experts to help make these decisions
- Regardless of which approach, or combination of approaches your agency uses, don't forget to document the decisions, decision-making process, and the related authorities, accountabilities, and responsibilities

Moving into Safety Risk Assessment

- Once you determine which potential consequences to assess, you can start on safety risk assessment
- Recall that safety risk assessment includes **determining the likelihood and severity of the potential consequence**
 - Your agency's ASP should describe this process

Documenting the Safety Risk Assessment

- If your agency chooses to use one, your agency can document the safety risk assessment in the safety risk register
- The example below shows a record of the likelihood and severity and the associated prioritization (unacceptable under the existing circumstance)

Identification							Initial Safety Risk Rating		
Hazard	Hazard Type	Identification Date	Identification Source	Analysis Date	Worst Possible, Worst Credible, or Most Common Potential Consequence(s)	Existing Mitigation(s)	Severity of Consequences	Likelihood of Consequences	Safety Risk Index
Buses misaligned over pits.	Technical - Maintenance	5/6/21	Employee safety reporting	05/21/21	Bus falling into pit resulting in worker fatality.	1. Training in aligning the bus properly over pit. 2. SOP and rule book provided with training.	I (Catastrophic)	C (Occasional)	IC (Unacceptable under the existing circumstances)

Severity of Consequences	Likelihood of Consequences	Safety Risk Index
I (Catastrophic)	C (Occasional)	IC (Unacceptable under the existing circumstances)

Sample Safety Risk Assessment Matrices



See FTA's [Sample Safety Risk Assessment Matrices for Bus Transit Agencies](#) for more information on establishing criteria for likelihood and severity and for more sample safety risk assessment matrices

IMPLEMENTING SAFETY RISK ASSESSMENT



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Implementing the Safety Risk Assessment Approach from your ASP

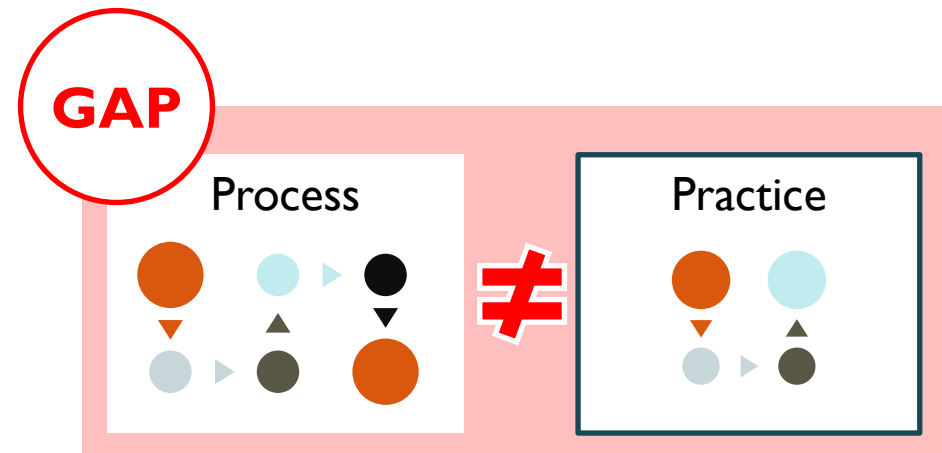
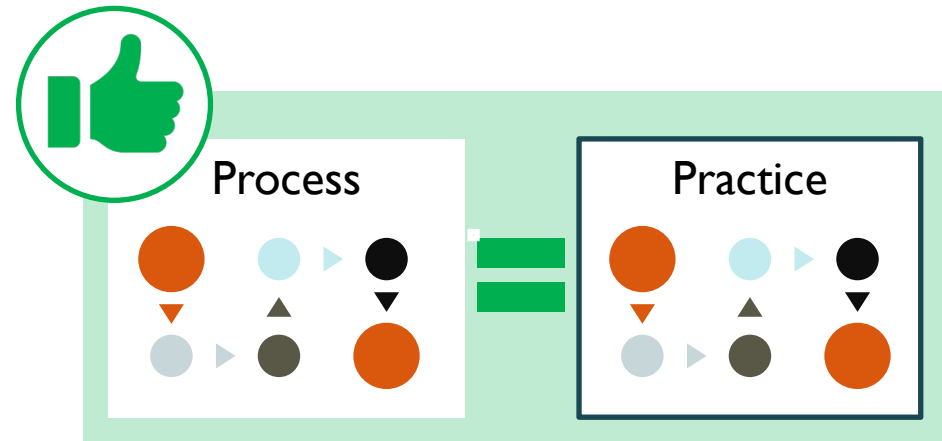
To prepare to implement safety risk assessment as part of an ASP implementation plan your agency can:

1. Evaluate your implementation status
2. Characterize any implementation gaps
3. Address implementation gaps

I. Evaluate Safety Risk Assessment Implementation Status

Evaluating implementation status can start with comparing the process for safety risk assessment your agency describes in your ASP to your agency's current activities

- Any areas that don't match up can be considered an "implementation gap"



2. Characterize Implementation Gaps

- Not all implementation gaps are the same
- Your agency may need to:
 - Do something new (establish a new activity)
 - Do something differently (modify an existing activity)
 - Do something consistently (restore a sporadic or dormant activity)

3. Address Implementation Gaps

Develop a project to address the implementation gaps, which could include tasks, roles and responsibilities, and timelines or due dates

Common Gap: Definitions

- Many agencies already identified “hazards” as part of their safety activities; however, the agency’s definition of hazard and potential consequences may be different under the ASP
 - This is the implementation “gap!”
- Agencies may need to modify this existing activity (do something differently) to apply the definitions of hazard and potential consequence established in the ASP

Common Gap: Definitions

- **Sample Implementation Gap:** The agency uses a different definition of hazard and potential consequences than that specified in their ASP
- **Sample Characterization of the Gap:** Need to do something differently (modify an existing activity)
- **Sample Project:** The agency will ensure that it uses the same definition as specified in their ASP by modifying existing materials and documents that reference the old definitions and providing retraining for those working on safety risk assessment and SRM

Common Gap: Determining Which Safety Hazards to Assess

- Agencies may not have a process to determine which safety hazards to assess
- Agencies may develop a process for determining which safety hazards to assess (doing something new/establishing a new activity)

Common Gap: Determining Which Safety Hazards to Assess

- **Sample Implementation Gap:** The agency does not have a process for determining which safety hazards to assess
- **Sample Characterization of the Gap:** Need to do something new (establish a new activity)
- **Sample Project:** The agency develops a process for determining which safety hazards to assess by:
 - Developing criteria for assessing safety hazards
 - Defining authorities, accountabilities and responsibilities associated with prioritization
 - Running a pilot using the new criteria to demonstrate the process to executive leadership and to ensure confidence in the outcomes
 - Training for those working on the SRM process and updates to agency materials and documents outside of the ASP, etc.

Common Gap: Consistent Documentation

- Some agencies may have conducted safety risk assessment activities or other hazard-related activities prior to the PTASP regulation, but they may have not consistently documented risk assessment activities
- Agencies may need to work to ensure that risk assessment activities are documented consistently (restore a sporadic or dormant activity)

Common Gap: Consistent Documentation

- **Sample Implementation Gap:** The agency does not consistently document the outcomes of its safety risk assessment process
- **Sample Characterization of the Gap:** Do something consistently (restore a sporadic or dormant activity)
- **Sample Project:** The agency:
 - Provides training for those working on the SRM process
 - Updates agency materials and documents outside of the ASP, etc.
 - Tasks CSO to perform quarterly compliance audits to ensure the process is followed

TRANSIT PRESENTATION



FEDERAL TRANSIT ADMINISTRATION



Anthony T. Carter Jr.
**Director of Risk
Management**
Greater Richmond Transit
Company (GRTC)
Richmond ,VA

- Joined GRTC in 2015 as the Director of the Risk Management, Safety, and Training and serves as the Chief Safety Officer and is responsible for:
 - Overseeing the claims handling process
 - Creating and implementing safety policies and procedures and ensuring compliance
 - Safety training
- Served as a Senior Insurance Fraud Investigator with Sentry Insurance
- Responsible for reviewing and investigating losses, reviewing and updating claims process investigative procedures, and leading training sessions on fraudulent activity in large losses
- Holds an MBA from Walden University and an undergraduate degree from Virginia State University

Agency Characteristics and Services

- Founded in 1860, the public transit system known today as GRTC Transit System, has operated continuously, with one temporary suspension of service during the Civil War, for over 150 years.
- Its history of being a progressive transit system was established when it was the first public transit agency to implement the system wide use of electric streetcars. That progressive attitude carries forth to today, with service improvements and additions such as expanded services for seniors and individuals with disabilities, welfare-to-work transportation, vanpool and carpool development, regional taxicab oversight, and expanded service to surrounding counties and cities, GRTC Transit System has truly become a world class transportation system serving every sector of the Richmond region. It is one of the most efficient transit systems in the United States.
- GRTC provides transportation services to the Richmond ,VA area and parts of Chesterfield and Henrico counties. These include fixed-route and express route bus service, specialized services such as CARE and C-VAN, and Ridefinders

Implementing Safety Risk Assessment Approaches

GRTC Agency Safety Plan: Safety Risk Assessment

- When putting the Risk Assessment Process in place, it was determined that many characteristics required to make this plan successful were already implemented.
- Areas that were identified that needed improvement were documentation as well as assigning staff to duties required for Risk Assessment.
 - Identifying/Recognizing Risk
 - Risk Register
 - SME (Subject Matter Experts) Committee Meetings
 - Follow up documentation on mitigations
 - Follow up monitoring to make sure mitigations are in place and are working

Implementing Safety Risk Assessment Approaches

Implementation of Safety Risk Assessment and ASP

- Starts with work culture and attitude
- Participation from employees
- Assigned duties to employees
- Discovered employee buy-in regarding safety and involvement in the overall safety management system
- Employees were willing to report hazards and SME's were willing to go out and inspect and create ideas and actions to eliminate the risk
- Safety has to be an Attitude/Behavior/Culture

PTASP Technical Assistance Center (TAC) Links and Contact Information



Technical Assistance Center

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

PTASP Community of Practice

- www.transit.dot.gov/PTASP-COP

Frequently Asked Questions

- www.transit.dot.gov/PTASP-FAQs

		transit.dot.gov/PTASP-TAC
		1 - 877 - 827 - 7243
		PTASP-TAC@dot.gov
		PTASP Technical Assistance Center 943 Glenwood Station Lane, Suite 102 Charlottesville, VA 22901



Available Resources on Safety Risk Assessment

- [Lessons Learned from Voluntary ASP Reviews \(Part I\): Final Steps and Safety Risk Management](#) (page 2)
- [ASP Lessons Learned](#) (pages 15-18)
- [Sample Bus Transit Provider ASP](#) (pages 18-24)
- [Sample Small Public Transportation Provider Agency Safety Plan](#) (pages 8-11)
- [PTASP Template for Bus Transit Reference Tool](#) (pages 13-15)
- [PTASP Bus Workshop Participant Guide](#) (pages 25-34, version 5)



Available Resources on Safety Risk Assessment

- [Safety Risk Management Fact Sheet](#)
- [Sample Safety Risk Assessment Matrices for Bus Transit Agencies](#)
 - [Guide to the Sample Safety Risk Register for Bus Transit Agencies](#)
- [PTASP Safety Risk Management webinar](#)
- [Safety Risk Management ASP Lessons Learned webinar](#)



Available Resources on ASPs

- [Sample Bus Transit Provider ASP](#) (pages 18-24)
- [Sample Small Public Transportation Provider Agency Safety Plan](#) (pages 8-11)
- [PTASP Template for Bus Transit Reference Tool](#) (pages 13-15)