

Safety Risk Management (SRM)

Kristofer Canto

Compliance and Safety Oversight Manager

Bureau of Transit, Local Roads, Railroads & Harbors

Wisconsin Department of Transportation

Transit Safety Presentation #2



Overview

- ▶ Review of MAP-21 and Safety Management Systems (SMS)
- ▶ Define Safety
- ▶ Safety Risk Management (SRM)
 - Hazard Identification
 - Risk Assessment
 - Risk Mitigation
- ▶ Summary
- ▶ What's Next?



MAP-21 and SMS



Summary of MAP-21 and SMS

- ▶ Under MAP-21 FTA has been given greater regulatory authority and will require that recipients of 5307/5311 funding develop a Public Transit Agency Safety Plan (PTASP)
- ▶ PTASPs will be developed using a Safety Management Systems (SMS) framework
 - What is most likely to be the cause of your next accident or serious incident?
 - How do you know that?
 - What are you doing about it?
 - Is it working?
- ▶ Notice of Proposed Rule Making expected Mid to Late 2015
- ▶ Safety Risk Management (SRM) is a critical component of the SMS framework



Recommended Transit Agency Safety Plan Elements

A. Policy Statement:	A policy statement establishing senior management commitment to continual safety improvement, signed by the executive accountable for the operation of the agency and the board of directors
B. Document Revision and Control:	A description of the regular annual process used to review and update the plan including a timeline for implementation of the process
C. Description of Core Safety Responsibilities:	A description of the responsibilities, accountabilities, and authority of the accountable executive, the key safety officers, and key members of the safety management team
D. Safety Training Program:	A description of the comprehensive safety training program for agency staff that ensures that staff are trained
SMS Policies and Procedures	
E. Safety Risk Management Approach:	A description of the formal processes the agency uses to identify hazards, analyze and assess safety risks, and develop, implement and evaluate risk controls
F. Prioritized Safety Risks:	A description of the prioritized, significant safety risks to the public personnel and property
G. Risk Control Strategies and Actions for Prioritized Safety Risks:	A description of the risk control strategies and actions that the agency will undertake to minimize exposure of the public, personnel and property to hazards, including a schedule for implementing the risk control strategies and the primary entity responsible for each strategy
H. Safety Assurance:	A list of defined safety performance indicators for each priority risk and associated targets the agency will use to determine if it is achieving the specified safety goals
I. Desired Safety Outcomes or Goals:	A description of desired safety outcomes for each risk using the measurable safety performance indicators established



Defining Safety



Defining Safety

- ▶ *Safety is the state in which the risk of injury to persons or damage to property is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and risk management.*



Safety Risk Management (SRM)



Recommended Transit Agency Safety Plan Elements

<p>A. Policy Statement:</p>	<p>A policy statement establishing senior management commitment to continual safety improvement, signed by the executive accountable for the operation of the agency and the board of directors</p>
<p>B. Document Revision and Control:</p>	<p>A description of the regular annual process used to review and update the plan including a timeline for implementation of the process</p>
<p>C. Description of Core Safety Responsibilities:</p>	<p>A description of the responsibilities, accountabilities, and authority of the accountable executive, the key safety officers, and key members of the safety management team</p>
<p>D. Safety Training Program:</p>	<p>A description of the comprehensive safety training program for agency staff that ensures that staff are trained</p>
<p>SMS Policies and Procedures</p>	
<p>E. Safety Risk Management Approach:</p>	<p>A description of the formal processes the agency uses to identify hazards, analyze and assess safety risks, and develop, implement and evaluate risk controls</p>
<p>F. Prioritized Safety Risks:</p>	<p>A description of the prioritized, significant safety risks to the public personnel and property</p>
<p>G. Risk Control Strategies and Actions for Prioritized Safety Risks:</p>	<p>A description of the risk control strategies and actions that the agency will undertake to minimize exposure of the public, personnel and property to hazards, including a schedule for implementing the risk control strategies</p>
<p>Safety Risk Management</p>	
<p>H. Safety Assurance:</p>	<p>A list of defined safety performance indicators for each priority risk and associated targets the agency will use to determine if it is achieving the specified safety goals</p>
<p>I. Desired Safety Outcomes or Goals:</p>	<p>A description of desired safety outcomes for each risk using the measurable safety performance indicators established</p>



Safety Risk Management

1. Hazard Identification (i.e. What is most likely to be the cause of your next accident or serious incident?)
2. Risk Assessment (i.e. How do you know that?)
3. Risk Mitigation (i.e. What are you doing about it?)



SAFETY RISK MANAGEMENT PROCESS

Identify hazards to passengers, employees, the general public, equipment, and assets

HAZARD IDENTIFICATION

Evaluate severity of consequences based on predicted scenarios of "what might happen"

Estimate likelihood of consequences based on historical data or experience

RISK ASSESSMENT FOR EACH HAZARD

Is the assessed risk acceptable?

YES

NO

Accept Risk

Take action to reduce the risk to an acceptable level

RISK MITIGATION



Safety Risk Management

Hazard Identification



Examples of Hazards

- ▶ **Design factors:** vehicles, tracks, equipment, etc.
- ▶ **Operating procedures and practices:** documentation, checklists, etc.
- ▶ **Communications:** methods, terminology, language
- ▶ **Personnel factors:** agency policies for recruitment, training and payment



Examples of Hazards

- ▶ **Organizational factors:** corporate safety culture, resource allocation, operating pressures, etc.
- ▶ **Physical defenses:** adequate detection and warning systems, traffic control devices, signaling, barriers, etc.
- ▶ **Regulatory and oversight factors:** application and enforcement of regulations; certification of equipment, personnel and procedures; and adequacy of safety audits



Hazard Identification – Tools

- ▶ Hazard and incident reporting systems that promote the identification of latent unsafe conditions;
- ▶ Safety surveys to elicit feedback from front-line personnel about areas of concern and unsatisfactory conditions that may have accident potential; and
- ▶ Operational inspections or audits of all aspects of operations to identify vulnerable areas before accidents or incidents confirm that a problem exists



Safety Assessment Example

SECTION	REVIEW QUESTIONS	YES	NO	N/A
Safety Policies:	• Are all safety policies up to date and reviewed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Is a Public Transit Agency Safety Plan (PTASP) or any other System Safety Plan written for the transit system?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Is the Drug and Alcohol Policy current and up to date?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
New Hire Employee Files:	• Was there a structured interview conducted and documented?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Is the applicant asked the questions relating to previous experience with drug and alcohol testing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Is the offer of employment documented in writing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Is there a pre-employment drug screen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Is there a pre-employment physical exam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Are safety sensitive responsibilities outlined in the job description?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Is there a completed Substance Abuse Policy and Drug Free Workplace Policy Acknowledgement form?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Is there a Current Policies and Procedures Acknowledgement Form?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Post Hire Employee Files:	• Is a current employee roster available?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Are the employee files maintained by the transit system?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Do existing employee files contain:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	> Background check?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	> Previous employer request form?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	> Verification of current driver's license and CDL?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	> Current MVR?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	> PARS Reports?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	> Current copy of physical exam certificate?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	> Signed Substance Abuse Policy Acknowledgement?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



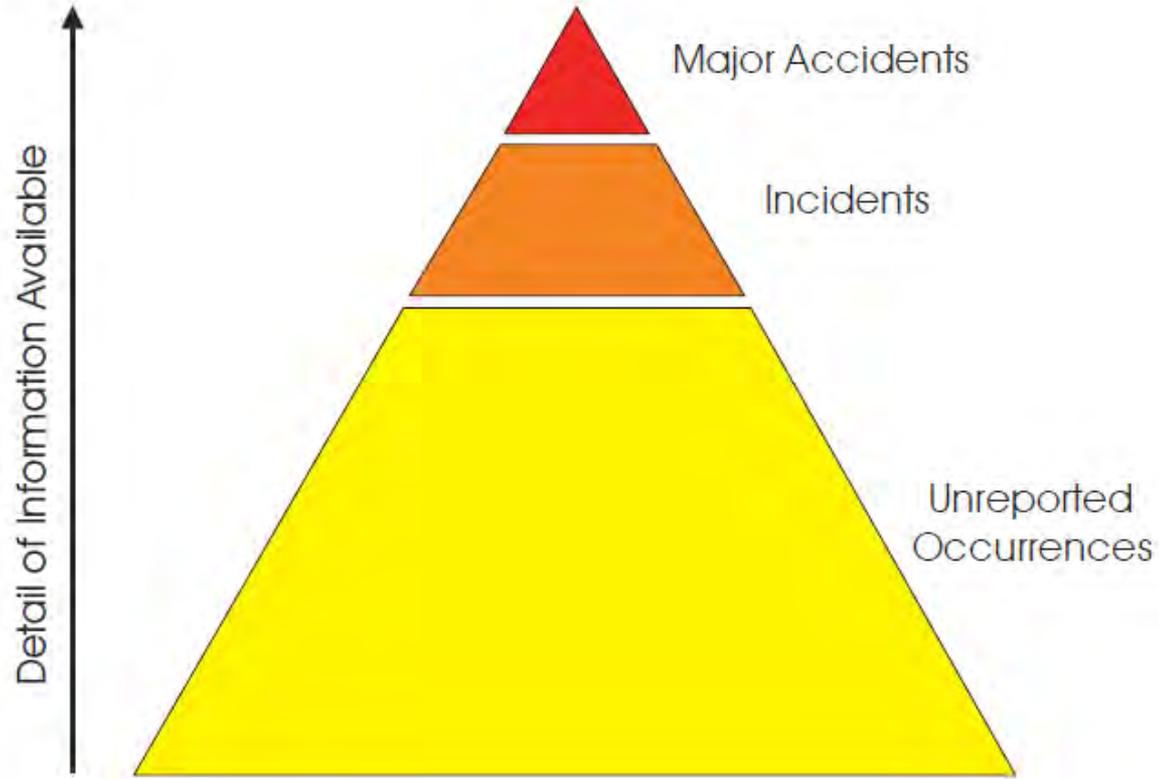
Facility Safety Audit Example

SECTION	REVIEW QUESTIONS	YES	NO	N/A
<i>Buildings and Facility Grounds:</i>	• Are facility grounds randomly and frequently patrolled?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Are daily security sweeps conducted?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Are smoke/fire/carbon monoxide detectors provided and working?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Are distribution and number of keys known and controlled?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Are all keys labeled as "DO NOT DUPLICATE"?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Are all unoccupied areas locked and secured?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Lighting:</i>	• Is entire perimeter of facility properly illuminated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Is lighting mounted at approximately second story level?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Are lights provided over all entrance doors?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Is lighting provided in staff parking areas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Entrance Doors and Windows:</i>	• Are all doors:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	➢ Built of commercial grade with metal framing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	➢ Outside hinges hidden and protected from vandalism?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	➢ Provided with a commercial grade, one-sided lock?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	➢ Provided with push "panic" bar releases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	➢ In case of breakage or opening are all windows and doors connected to a central station alarm?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Electronic Surveillance:</i>	• Is the entire perimeter of facility protected by a CCTV system?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Is this system monitored by management and/or a security company?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Is this system always on or activated by motion sensors?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Non-Punitive Reporting Policy

Hazard Identification



Safety Risk Management

Risk Assessment



Risk Assessment considers:

- ▶ The **likelihood** of the hazard precipitating an unsafe event;
- ▶ The **severity** of the consequences of the unsafe event if the hazard is allowed to remain; and
- ▶ The **exposure** to the hazard (e.g., number of passengers-mile per day, number of pedestrians using a grade crossing during the peak-hour, number of vehicles per hour, etc., and the characteristics of transit users and vehicles).



Risk Assessment Matrix (RAM)

Identified Hazard: **Bus/Bike Collision**

Consequences					Likelihood				
Severity	1 People	Assets	Environment	Reputation	1	2	3	4	5
					Practically impossible (never heard of in the industry)	Remote, not likely to occur	Could occur or heard of happening	Likely, known to occur or has happened before	Common, or occurs frequently
1	First aid or no injury	No/Slight damage	No/Slight effect	No/Slight impact	Low	Low	Low	Low	Medium
2	Slight injury, medical treatment	Minor damage	Minor effect	Limited impact	Low	Low	Medium	Medium	High
3	Serious injury, hospitalization more than 7 days	Moderate damage	Moderate effect	Local area impact	Low	Low	Medium	High	High
4	Permanent total disability, or one fatality	Major damage, unit level	Major effect	Major statewide impact	Low	Medium	High	High	High
5	Multiple fatalities	Major damage, multiple units	Massive effect	Major national impact	Medium	Medium	High	High	High
Risk Value:	3 X 4 = 12								

Low Risk, continuous improvement

Medium Risk, monitor and control

High Risk, unacceptable/intolerable, immediately introduce further control measures

Assessed Risk Level: **0**



Risk Assessment Log Example

APPENDIX E

TRANSIT AGENCY

HAZARD IDENTIFICATION AND RISK ASSESSMENT LOG

The Hazard Identification and Risk Assessment Log shown can be used to provide a record of the identified hazards and the actions that should be taken. The recommended action must be addressed by a specified individual, typically the appropriate line manager responsible for addressing that particular risk, and a target date for completion must be given. Entries in the log should not be cleared until the required action is completed. The hazard log and action completion records should be retained permanently by the Safety Manger (SM).

Completed by: **INSERT REVIEWER NAME** Last Updated: **INSERT DATE**

Risk Type	Risk Description	Current Measures to Reduce Risk	Risk Rating Likelihood	Risk Rating Severity	Risk Rating Value (Likelihood x Severity)	Further Action Required to Reduce Risk	Staff Responsibility
Human Error	Non-compliance with agency maintenance protocol	<ul style="list-style-type: none"> • Minimum competency requirements • Effective safety culture in agency (maintenance department) • Effective task planning • Availability of procedures • Procedure reviews and simplification into tasks • Recurrent training 	5	4	20	<ul style="list-style-type: none"> • Introduce compliance monitoring • Effective supervision including work compliance assessment • Competency assessments • Maintenance policy to reinforce need for compliance 	<ul style="list-style-type: none"> • Safety Assurance • Line Manger • Maintenance Manager
		•				•	•



Safety Risk Management

Risk Mitigation



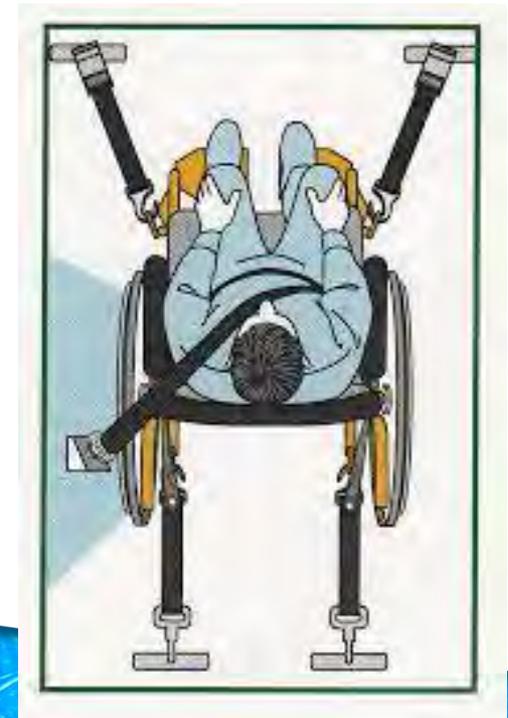
Risk Mitigation

- ▶ Risk mitigation strategies can be categorized into three broad categories:
 1. Physical defenses
 2. Administrative defenses
 3. Behavioral defenses



Physical Defenses

- ▶ Objects and technologies that are engineered to discourage, warn against, or prevent potentially hazardous actions and mitigate the consequences of events



Administrative Defenses

- ▶ Procedures and practices that mitigate the likelihood of an accident/incident
 - Safety regulations
 - Standard operating procedures
 - Personnel proficiency
 - Supervision
 - Inspection
 - Training



Behavioral Defenses

- ▶ Education and public awareness campaigns
- ▶ Aimed at passengers and pedestrians
- ▶ Addresses factors outside the control of the transit agency



Prioritized Safety Risk Log Example

APPENDIX F

TRANSIT AGENCY
PRIORITIZED SAFETY RISK LOG

This Prioritized Safety Risk Log is used to organize identified safety risks facing TRANSIT AGENCY. The Log should be updated frequently to demonstrate continual progress towards risk reduction through mitigation strategies. A timeline is used to highlight projected completion dates.

Completed by: **INSERT REVIEWER NAME** Last Updated: **INSERT DATE**

Priority	Risk Description	Planned Mitigation Strategies	Outcomes of Planned Mitigation Strategies	Responsible Staff	Timeline	Status
1	Non-compliance with agency maintenance protocol	<ul style="list-style-type: none"> • Introduce compliance monitoring • Effective supervision including work compliance assessment • Competency assessments • Maintenance policy to reinforce need for compliance 	•	<ul style="list-style-type: none"> • Safety Assurance • Line Manger • Maintenance Manager 	<ul style="list-style-type: none"> • Begin January 2015 • Complete August 2015 	Open
2		•	•	•	•	
3		•	•	•	•	
4		•	•	•	•	
5		•	•	•	•	
6		•	•	•	•	
7		•	•	•	•	
8		•	•	•	•	
9		•	•	•	•	
10		•	•	•	•	



Summary

- ▶ Safety Risk Management (SRM) is a critical component of the SMS framework
 1. **Hazard Identification** (What is most likely to be the cause of your next accident or serious incident?)
 - Incident reporting systems, assessments, audits, inspections, etc.
 2. **Risk Assessment** (How do you know that?)
 - Risk Assessment Matrix (RAM), Risk Assessment Log
 3. **Risk Mitigation** (What are you doing about it?)
 - Prioritized Safety Risk Log, Action Strategies, Expected Outcomes, etc.



What's Next?

- ▶ ***Completing the SMS framework through Safety Assurance and Safety Performance Measurement (Is it working?)***



Recommended Transit Agency Safety Plan Elements

A. Policy Statement:	A policy statement establishing senior management commitment to continual safety improvement, signed by the executive accountable for the operation of the agency and the board of directors
B. Document Revision and Control:	A description of the regular annual process used to review and update the plan including a timeline for implementation of the process
C. Description of Core Safety Responsibilities:	A description of the responsibilities, accountabilities, and authority of the accountable executive, the key safety officers, and key members of the safety management team
D. Safety Training Program:	A description of the comprehensive safety training program for agency staff that ensures that staff are trained

SMS Policies and Procedures

E. Safety Risk Management Approach:	A description of the formal processes the agency uses to identify hazards, analyze and assess safety risks, and develop, implement and evaluate risk controls
F. Prioritized Safety Risks:	A description of the prioritized, significant safety risks to the public personnel and property
G. Risk Control Strategies and Actions for Prioritized Safety Risks:	A description of the risk control strategies and actions that the agency will undertake to minimize exposure of the public, personnel and property to hazards, including a schedule for implementing the risk control strategies

Safety Risk Management

H. Safety Assurance:	A list of defined safety performance indicators for each priority risk and associated targets the agency will use to determine if it is achieving the specified safety goals
I. Desired Safety Outcomes or Goals:	A description of desired safety outcomes for each risk using the measurable safety performance indicators

Safety Assurance and Performance Measurement



Resources

- ▶ [WisDOT Transit Safety Webpage](#)
- ▶ [FTA Bus Safety Webpage](#)
- ▶ [FTA SMS Webpage](#)
- ▶ [Transit Safety Management and Performance Measurement Guidebook](#)
- ▶ [WisDOT Transit Safety Presentation #1](#)



Questions?

Kristofer Canto

Compliance and Safety Oversight Manager

Bureau of Transit, Local Roads, Railroads & Harbors

Wisconsin Department of Transportation

Phone: 608-266-8165

Email: Kristofer.Canto@dot.wi.gov

