Safety Management Systems (SMS), Rule 14-90 FAC, and Public Transportation Agency Safety Plan (PTASP) – Part 1

Presenters:
Ashley Porter, FDOT
Paul Goyette and Stephen Berry, CUTR

CENTER FOR URBAN TRANSPORTATION RESEARCH

Session Outline

- SMS introduction
- SMS implementation highlights and plan
- Detailed components of SMS
  - Safety Management Policy
  - Safety Risk Management
  - Safety Assurance
  - Safety Promotion

SMS Implementation

SMS Introduction: What is SMS?

- SMS is Safety Management System
- Federal requirement
- SMS is 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
- Stresses risk reduction strategies
- Elevates profile of safety department
- Expanded responsibilities

SMS Implementation: Law of the Land

- Federal laws now require transit agencies to meet SMS requirements | non-negotiable
- States must elevate SSO programs
- Existing Florida laws; but further revisions required
  - Compliance in some areas
  - Ongoing modifications/certification process
- Peer agencies in FL and all other SSOs face the same implementation challenges
- Transition period
- Critical deadlines approaching; must plan and take action

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SMS Implementation: Costs

- Long term goal: cost savings through reduced risk
- Cost effective to plan and act sooner
- Utilize existing resources
- Delayed implementation will result in higher cost
  - Pick two:
    - High quality
    - Completed quickly
    - Low cost

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SMS Implementation

- Phase 1: Prepare
- Phase 2: Develop
- Phase 3: Operationalize

Phase 1: Prepare

- Engage key individuals and build a team
  - Appoint the accountable executive
  - Designate the SMS lead
  - Establish the SMS implementation team
  - Identify key partners such as union leaders and external partners like public safety and emergency response entities
- Get familiar with SMS implementation
  - Team should receive training on how to implement and operate an SMS
- Identify gaps
  - Perform an SMS gap analysis to identify elements that already exist in the agency and areas that need improvement
- Conduct a safety culture survey
- Make a plan to fill the gaps

Phase 2: Develop

- Design the safety risk management process
  - Identify safety concerns: establish an employee safety reporting program
  - Assess risk associated with safety concerns
    - Adopt safety risk matrices
    - Establish criteria for elevating severe risks up the management chain
  - Develop hazard identification, analysis, safety risk evaluation, and mitigation documentation

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Phase 2: Develop

- Build the safety assurance function
  - Safety performance monitoring and measurement
    - Establish safety performance indicators and safety performance targets
  - Management of change
    - Define trigger thresholds for engaging management of change activities
    - Develop criteria for operations under changed operational conditions
  - Continuous improvement of SMS
    - Establish SMS audits
    - Identify safety assurance and oversight activities carried out by external agencies
  - Document all safety performance and monitoring, management of change, and continuous improvement activities

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Phase 2: Develop

- Determine SMS-related training and communication
  - Identify key competencies and develop appropriate training
  - Develop tools and processes to communicate safety up, down, and across the agency
- Draft safety management policies to formally establish SSM processes and activities throughout the agency
  - Draft a Public Transportation Agency Safety Plan (PTSAP) to related policy documents
  - Propose safety management accountabilities and responsibilities for the organization

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Phase 3: Operationalize

- Put SMS policies, processes, and activities into practice as they're approved by the agency
  - Draft and distribute Safety Management Policy Statement (SMPS) signed by the Accountable Executive introducing the agency to SMS
  - Example activities:
    - Adopt safety management policies
    - Execute the safety risk management process
    - Perform safety assurance functions
    - Deliver SMS-related training
    - Enable SMS-related communication

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The Foundation of SMS

Employee Safety Reporting

- SMS requires accurate data
- Employees know actual system performance
- Prerequisites of effective safety reporting
  - Willingness: data must be used to proactively address the problem
  - Knowledge/Information: hazards are properly reported (the result of training)
  - Flexibility: different reporting avenues so reporting is quick and easy to do
  - Learning: organization must implement reforms as appropriate
  - Accountability: reported information is used for positive change not punitive action

Employee Safety Reporting (cont'd)

- Characteristics of successful safety reporting programs
  - Training: instruct employees what to report and how to report it
  - Ease of reporting: reporting medium must be simple
  - Feedback: quick feedback to reporters so they know action is being taken
  - Protection of information: information is to be used to enhance safety not take action against employees (unless the situation warrants it)
  - Vehicle for change: continuous improvement by the organization helps drive the process forward

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Four Steps in Safety Reporting Management

- Reporting: events/circumstances and conditions
- Storage: standardization and ease of access
- Analysis: data into information and intelligence
- Information exchange: cannot develop mitigating strategies for the unknown

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Employee Safety Reporting, Continued

- Mandatory or voluntary?
- Confidentiality

Traditional Perspective: Criminalization of Error

Emerging Perspective: Just Culture

Future Perspective: Constant Flow of Information

Discussion

The Four Components of SMS

Component 1: Safety Management Policy

- Safety management policy statement
- Safety accountabilities and responsibilities
- Integration with public safety and emergency management
- SMS documentation and records

Components of a Safety Management Policy Statement

- Frames the fundamentals that the SMS will operate clearly and succinctly
- Critical elements:
  - Signed by highest executive in agency (CEO/GM and Board of Directors)
  - Clear statement about the provision of resources for the management of safety necessary for service delivery
  - Safety reporting procedures
  - Conditions under which exemptions from disciplinary action would be applicable
  - Unacceptable operational behaviors
  - Communication (with visible endorsement) throughout the transit agency

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Accountable Executive

- A single, identifiable person who has ultimate accountability and responsibility for implementation and maintenance of the agency's SMS system
- Carries out the agency's Transit Asset Management Plan
- Controls and directs human and capital resources to develop and maintain the agency's Public Transportation Agency Safety Plan (PTASP) and Transit Asset Management Plan
- Ensures safety concerns are considered in the agency's ongoing budget planning process
- Ensures transparency in safety management priorities for the Board of Directors and employees
- Establishes guidelines of levels of acceptable safety risk
- Assures Safety Management Policy Statement is appropriate and well-communicated

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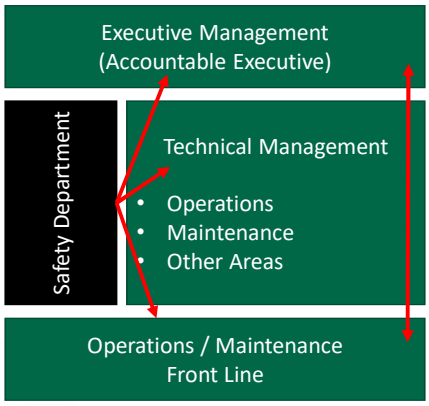
SMS Manager/Key Personnel

- Manages the SMS on behalf of the Accountable Executive
- Directs hazard identification and safety risk evaluation
- Monitors mitigation activities
- Provides periodic reports on safety performance
- Maintains safety documentation
- Plans and organizes safety management training
- Scales to the size of the organization

SMS Organizational Structure

- Must be flexible and scalable to the size of the organization
- Must have clear lines for safety communication
- Must have accountability for safety performance at the highest level individuals in the agency
- Must have clearly defined and executed safety roles and responsibilities
- Frontline employees are critical to SMS success through their role in reporting safety hazards
- While the safety department sets the direction of SMS, all parts of the organization are responsible for enacting it
- The two-way arrow symbolizes the top-down as well as bottom-up approach to safety



SMS Organizational Structure – Safety Office

- Safety office
  - Safety management data collection and analysis
  - Hazard identification and safety risk analysis
  - Provides information and intelligence to line managers
  - Safety performance monitoring
  - Advises senior management on safety matters

SMS Organizational Structure – Committees

- Executive level committee
  - Ensures that resources are allocated to achieve safety performance goals
  - Monitors SMS safety performance against established safety performance
- Management/supervisor level committee
  - Reports to executive level committee and takes strategic direction from them
  - Consists of managers and supervisors from functional areas PLUS front-line personnel
  - Coordinates implementation of safety risk mitigations
  - Reviews the effectiveness of safety risk mitigations
  - Assesses the impact of safety on operational changes
  - Monitors safety promotion

SMS Documentation and Records

- Key elements of SMS plan must be formalized and documented:
  - Safety management policy and objectives
  - SMS requirements
  - SMS processes and activities
  - Accountabilities, responsibilities, and authorities for processes and activities
  - Outputs of safety risk management and safety assurance processes

The Four Components of SMS

Risk Management Definitions

- Safety deficiency – a condition that is the source of hazards and/or allows for the perpetuation of hazards in time
- 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 public transportation system; damage to the environment; or reduction of ability to perform a prescribed function
- Consequence – potential outcome of the hazard

Component 2: Safety Risk Management

Hazard Identification

- More comprehensive data sources result in the identification of more hazards
- Employees must be trained on the identification of hazards
- Hazard identification sources
  - Safety reporting program
  - Inspections
  - Internal safety investigations
  - Accident reports
  - Compliance programs
  - Committee reviews
  - Industry data
  - Governmental sources (FTA, NTSB)
  - Customer and public feedback or complaints
  - New projects

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Component 2: Safety Risk Management

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Hazard Analysis

- Analysis should be performed by SMEs from appropriate departments who know the technical aspects of the equipment or issue at hand (outside experience may be necessary)
- Analysis includes:
  - Stating the generic hazard
  - Identifying the components of the hazard
  - Identifying specific consequences of the hazard

Component 2: Safety Risk Management

Evaluate the Safety Risk

- Measure the probability of occurrence and seriousness of the consequences of hazards
- Evaluate the current safety risk mitigations
- Index safety risk based on this consequence probability and severity analysis
- Determine level of acceptability

Risk Probability Table (MIL-STD-882E)

PROBABILITY LEVELS			
Description	Level	Specific Individual Item	Fleet or Inventory
Frequent	A	Likely to occur often in the life of an item.	Continuously experienced.
Probable	B	Will occur several times in the life of an item.	Will occur frequently.
Occasional	C	Likely to occur sometime in the life of an item.	Will occur several times.
Remote	D	Unlikely, but possible to occur in the life of an item.	Unlikely, but can reasonably be expected to occur.
Improbable	E	So unlikely, it can be assumed occurrence may not be experienced in the life of an item.	Unlikely to occur, but possible.
Eliminated	F	Incapable of occurence. This level is used when potential hazards are identified and later eliminated.	Incapable of occurence. This level is used when potential hazards are identified and later eliminated.

Risk Probability Table (MIL-STD-882E)

SEVERITY CATEGORIES		
Description	**Severity Category**	**Mishap Result Criteria**
Catastrophic	1	Could result in one or more of the following: death, permanent total disability, irreversible significant environmental impact, or monetary loss equal to or exceeding $10M.
Critical	2	Could result in one or more of the following: permanent partial disability,injuries or occupational illness that may result in hospitalization of at least three personnel, reversible significant environmental impact, or monetary loss equal to or exceeding $1M but less than $10M.
Marginal	3	Could result in one or more of the following: injury or occupational illness resulting in one or more lost work day(s), reversible moderate environmental impact, or monetary loss equal to or exceeding $100K but less than $1M.
Negligible	4	Could result in one or more of the following: injury or occupational illness not resulting in a lost work day, minimal environmental impact, or monetary loss less than $100K.

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Risk Probability Table (MIL-STD-882E)

RISK ASSESSMENT MATRIX				
SEVERITY / PROBABILITY	Catastrophic (1)	Critical (2)	Marginal (3)	Negligible (4)
Frequent (A)	High	High	Serious	Medium
Probable (B)	High	High	Serious	Medium
Occasional (C)	High	Serious	Medium	Low
Remote (D)	Serious	Medium	Medium	Low
Improbable (E)	Medium	Medium	Medium	Low
Eliminated (F)	Eliminated			

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Component 2: Safety Risk Management

Safety Risk Mitigation

- Risks must be mitigated if they fall into the unacceptable region or are acceptable only with mitigation measures in place
- Mitigations need to be aligned with the agency's safety performance objectives
- Those that have been mitigated must be constantly monitored to ensure the mitigation strategy is effective

Component 2: Safety Risk Management

Risk Monitoring

- Reduce the probability or severity to reach an acceptable level
- Isolate the effects of the consequences (i.e. ensure people have proper training to do specific tasks)
- Build-in redundancy (i.e. give multiple protections to ensure an accident would require failure on multiple levels)
- Safety risk mitigation ownership
  - Operations and maintenance managers are responsible for implementing and tracking mitigation strategies
  - Safety personnel or department is responsible for monitoring the effectiveness of mitigation strategies through the Safety Assurance (next module) function
  - All stakeholders must have some level of responsibility for tracking safety risk mitigation strategies

The Four Components of SMS

Component 3: Safety Assurance

- Safety assurance means the processes within a transit agency's SMS designed to:
  - Ensure the implementation and effectiveness of safety risk mitigation
  - Ensure that the transit agency meets or exceeds its safety objectives through the collection, analysis, and assessment of information
  - Manage changes/proposed changes through this lens

Safety Performance, Monitoring, and Measurement

- Safety Assurance activities and tools must be established and exercised
- Ongoing capture of data and information is critical
- Collected data and information need to be examined for hazards and measured against safety performance targets

Continuous Monitoring Activities

- Monitor service delivery activities (including field observations)
- Monitor operational and maintenance data
- Assess external information including FTA Safety Advisories, NTSB recommendations, FTA SSO audit findings, etc.
- Assess employee safety reporting program
- Conduct evaluations of the SMS
- Conduct safety audits, reviews, studies, and inspections
- Conduct safety surveys and investigations
- Change management processes

Management of Change Criteria

- No operations should take place in the changed environment until:
  - The change is evaluated to determine if it will impact safety
  - The safety risk evaluation is completed if the change will impact safety
- Differences from current process:
  - Safety Risk Management must be performed whenever there is a change in the operating environment that will impact safety

Continuous Improvement

- A process by which a transit agency examines safety performance to identify safety deficiencies and carry out a plan to address the identified safety deficiencies
- Evaluating the SMS
- Measuring SMS performance
  - Ensure that SMS is helping agency achieve its safety performance targets
  - Key elements include SRM process and outputs, change management, compliance activities, and performance auditing
- Methods for evaluating SMS performance
  - Internal and external audits to evaluate integrity of resources, processes, and activities
  - Self-assessments including GAP analysis and checklist

The Four Components of SMS

Component 4: Safety Promotion

- Sets the tone for agency's safety culture
  - Ongoing communication: up, down, and across
  - Communicates lessons learned and safety information
  - Demonstrates management commitment
  - Develops safety management skills to support safety performance improvements
- Includes **safety communications** and **competencies and training**
- "The single biggest problem in communication is the illusion that it has taken place." – George Bernard Shaw

Safety Communication

- Ensure personnel are always aware of the SMS
- Convey critical safety information
- Explain why particular actions are taken
- Explain why safety procedures are introduced or changed
- Provide feedback on employee-reported hazards and safety concerns

Safety Communication

- Answer the 6 questions:
  - WHAT is the information being communicated
  - WHO is your audience – be targeted
  - WHY is this being communicated – be purposeful
  - WHERE should this information be communicated – identify the best avenues
  - WHEN should the information be communicated – timing and frequency
  - HOW should the information be communicated – best medium and format

Competencies and Training

- All employees need to be trained and educated on the SMS
  - Understanding of safety performance targets
  - Fundamentals of the SMS
  - Safety reporting
  - Individual roles within the SMS
- Managers and supervisors need training on safety data management
  - Analyze safety data
  - Extract information from safety data
- Senior management commitment
  - Shows commitment by ensuring resources are sufficient to carry out an effective safety management training program

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Design and Develop Safety Training Curriculum

- Establish training tasks
- Identify the timing and sequencing for each job category's specific safety management training
- Establish qualification standards and evaluation criteria for performance measurement
- Identify the medium for training
- Develop lessons, exercises, and activities based on your safety training objectives
- Develop tests and evaluations
- Develop pilot courses

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Difficult Questions Agencies May Have To Address

1. **Cost** - This could vary depending if the agency develops the SMS team in-house or hires a consultant. For smaller agencies that will adopt and develop SMS/PTASP on their own we can provide guidance on a process to use limiting the cost by using in-house staff. If a consultant is used to develop the entire program then it could get quite costly and may be tougher for agencies to maintain since the consultant will more than likely not be around long term to assist in on going SMS process.
2. **Confusion of transition** - The State rule will still provide framework and a foundation to build a working SMS on. SMS can then be the safety management culture for the agency and critical parts of the FL rule can be merged into a PTASP that supports both SMS and the FL rule.
3. **Dates** - July 2020 is the official date but it is more important to begin a SMS/PTASP process and develop working drafts that can be compared against the FTA framework.
4. **Who has to do it agencies** with 100 plus buses used in a peak pull out environment, but smaller agencies should consider developing a smaller scale SMS culture. For example , the military and smaller airline providers still use SMS concepts even though there is no minimum threshold for equipment. The risk and potential outcome of a safety event dictate the need for SMS within those environments.
5. **What if agency wants to do it?** All agencies should be encouraged to develop an SMS culture that fits their organization, since the goal is to identify and reduce safety events whether large or small.
6. **Does FDOT make my plan?** The understanding initially was that the States (or at least FL) would take the lead on SMS development for the agencies. At this point we believe it is prudent for the agencies to develop SMS that fits their organization's needs.
7. **Does FDOT or FTA review my plans?** For fixed guideway (SSO) yes the State will have oversight through the triennial process. FTA for sure will be inquiring about SMS development for applicable properties after the deadline.
8. **Agency needs assistance** - This should be discussed and minutes taken to determine what the level of effort could be for technical assistance. This way FDOT can determine how to approach this need based on input from the agencies.

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Discussion

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Part 2 Preview

- Recap SMS
- Developing framework for Public Transportation Agency Safety Plan
- Break out working groups