FTA
FEDERAL TRANSIT ADMINISTRATION

PTASP TECHNICAL ASSISTANCE CENTER

Potential Sources of Hazard Information for Bus Transit Operations

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About This Document

The Federal Transit Administration (FTA) prepared this document to help your transit agency identify potential sources of hazards for analysis through the Safety Risk Management (SRM) process. SRM works within your agency's Safety Management System (SMS) to help you assess and mitigate safety risk.

FTA defines a hazard in 49 C.F.R. § 673.5 as "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." A hazard has potential consequences that may cause harm or adverse effects.

To meet SRM requirements under Part 673, your agency must "establish methods or processes to identify hazards and consequences of the hazards" (§ 673.25(b)). This includes assessing the safety risk of a hazard's potential consequences and mitigating any risk your agency finds unacceptable.

Your agency may identify hazards as part of:

- Your existing operations and maintenance activities,
- Changes to your existing public transportation system and its operating environment, and/or
- Capital projects, including vehicle procurements and technology and systems upgrades.

Hazards may be identified as safety concerns or issues, reported by passengers or employees, highlighted in trends or analysis, experienced in incidents or accidents, or identified through safety surveys, audits or other means. Your agency may review these safety concerns and issues to determine if they constitute hazards to be put through your agency's SRM process or if they require monitoring or corrective action.

Sources of Hazard Information

Your agency has many sources of information related to safety concerns that you can use to help identify hazards. Your agency may collect this information through proactive activities, such as using an employee safety reporting program or monitoring service operations, and reactive measures, such as investigating past events that may or may not have resulted in injuries or damage. By analyzing this collected safety data, your agency can determine its topmost safety concerns and how it will prioritize the

investment of resources to address them. Major sources of information about hazards are discussed below.

Employee Safety Reporting Program

Your agency has many sources of safety data and information, but the Employee Safety Reporting Program (ESRP) may be the single most important source of information for the management of safety. No matter how much an agency plans its operations, it cannot anticipate all contingencies and changes. When unplanned conditions arise during operations, frontline employees observe them first. An ESRP turns frontline employees into the "safety eyes" of the agency.

An effective ESRP allows employees who observe safety concerns in their day-to-day duties to notify designated personnel – without fear of reprisal – of safety concerns, operational deficiencies, instances of non-compliance and deviations from procedures, before they result in an actual safety event. For example, employees may report observed speeding on bus routes, failure to complete pre-trip inspections, detours and traffic work zones on route, non-working traffic lights or crossing gates, damage to terminals and bus stops that might impact safety, defective roadways (i.e. potholes, worn striping, crumbling asphalt), and clearance issues.

Your agency may collect safety information from employees in many different ways:

- Safety hotline, such as a 1-800 number or other designated number to call and report safety concerns,
- Safety email or reporting form on an agency intranet or website,
- Form or note dropped in a safety box in a break room or facility,
- Verbal or written reports to supervisors, managers, or safety officers,
- Safety committee meetings,
- Driver meetings, and/or
- Reports issued to dispatch over the radio or on mobile data terminals.

Inspections

Inspections conducted at your agency may provide an important source of information about hazards. Results from these inspections may identify areas where mitigations designed and adopted to manage safety risk are not being carried out as required. Your agency may audit personnel performing their job duties, vehicles, facilities, and data to identify potential safety concerns or issues, such as:

- Rules compliance checks, which may identify:
    - Non-compliance with safety rules,
    - Challenges in complying with safety rules, and/or
    - Emerging practices.
- Operations personnel fitness-for-duty checks, which may identify:
    - Impairment,
    - Fatigue,
    - Absence of corrective lenses,
    - Apparent injuries, and/or
    - Uniform or equipment issues.
- Radio or digital communication checks, which may identify radio failures, dead spots, and areas of high interference.
- CDL and driver citation checks, which may identify driver non-compliance with driving regulations and requirements.
- Pre-trip inspections, which may identify instances of a bus beginning revenue service after failing a pre-trip inspection.
- Vehicle inspections, which may identify a series of defects in components and part with the potential to impact the safety performance of the vehicle.
- Facility inspections, which may identify conditions with the potential to impact safety.

Investigations

As part of its SMS, each transit agency "must investigate safety events to identify causal factors" (§ 673.27(b)(3)). Safety events as defined in § 673.5 include accidents, incidents, and occurrences.

"Investigation" is defined in § 673.5 as "the process of determining causal and contributing factors" for the purpose of "preventing recurrence and mitigating risk". Causal and contributing factors may include key actions, situations, or conditions, the elimination of which, would have prevented or reduced the effects of the safety event.

Investigations may be an important source of data for monitoring and measuring compliance with and effectiveness of procedures and safety risk mitigations.

Investigations may identify hazards to be considered in your SRM process, from:

- Driver, dispatcher, supervisor, and mechanic performance information,

- Training and evaluation information,

- Rule compliance and sufficiency information,

- Camera and event recorder information,

- Vehicle information,

- Vehicle performance and maintenance information,

- Radio or digital communications information, and/or

- Environmental information.

Causal and contributing factors also present potential issues and concerns your agency may choose to assess through its SRM process. These factors may include organizational issues, technical failures, environmental conditions, and other issues.

Safety Trend Analysis

Safety trend analysis identifies patterns or changes at your agency that might otherwise be overlooked during the collection of or lost in the noise of your safety data. Patterns and changes can be related to behavior, occurrences, or other aspects of your operations. They are usually identified through analysis of a particular period of time. For example, you may identify trends that occur:

- Weekly,

- Monthly,

- Seasonal,

- Yearly, or

- Over a certain number of years.

Your agency may identify trends for specific types of accidents, incidents, or occurrences, or even for precursors to safety events that your agency has identified. Notable trends may indicate hazards to be assessed through your SRM process.

Cameras and Data Recorders

Your agency may use technologies, including onboard cameras and accelerometers, video systems, and GPS and mobile data terminals to help ensure the safety of the driver and passengers.

Recordings resulting from these technologies may identify potential sources of hazards in your agency's operations, including driver behaviors, operating environments, road conditions, changing configurations, vehicle handling, and use of defensive driving techniques.

Training and Evaluation Records

Information compiled from your training program and the training evaluations of your agency's personnel may help you identify hazards for assessment through your SRM process.

Analysis of this information helps your agency recognize where personnel may struggle to understand rules, requirements, or safe behaviors identified by your agency, and where particular agency procedures, practices, or requirements may need to be modified to address safety issues or concerns.

Agencies may review the results of training assessments and evaluations yearly, quarterly, or even monthly to identify potential issues or concerns for further assessment.

Internal Safety Audits

Internal safety audits and reviews highlight how well safety is working at your agency. Examples of internal audits that may help you identify safety concerns or hazards include:

- Route qualification audits, which identify situations such as:
    - An operator who is assigned to a route without receiving route qualification, or
    - An extra board operator who is not qualified on all potential route assignments.
- Recertification or refresher status audits, which may identify operators past their recertification or refresher training window.
- Observation audits, which typically include line rides by instructors and safety officers, and which may identify operator behaviors and road conditions with potential safety impacts.
- Hours of service audits, which may identify operators working excessive hours with limited opportunity for sufficient rest, as defined in your agency's policies and procedures.

Monitoring of Normal Operations

Observing your agency's normal operations helps you understand how service is provided in your system. Normal operations can be observed from a safety perspective to understand how things are done at your agency (as opposed to a compliance audit).

Targeted monitoring activities designed to observe your agency's normal service can help your agency identify hazards for assessment. For example, observations of the bus dispatch center may identify and avoid practices that lead to confusion or distraction for dispatchers. Observing how buses pull in and out of a transit center may help you identify concerns affecting pedestrians. Observing the performance of preventive maintenance inspections may indicate a potential concern with the use of lubricants that could lead to overheating and fire.

External Sources

External sources also provide valuable information to review safety performance and identify hazards, including:

- FTA and other oversight authorities, which provide information based on Federal, State or local findings, research, considerations, or assessments.

- Reports from the public, such as motorists, bicyclists, or pedestrians, which may contain safety information such as reckless driving, near misses, unsafe acts, or inattention. These reports should be confirmed by management before being entered as a hazard for SRM.

- Safety audit findings and recommendations, which often require action in response to underlying concerns that your agency may want to run through its SRM process.

- Safety bulletins and information from manufacturers and transit associations, which may identify issues or concerns to be reviewed by your agency in its SRM process.

Generic Hazard List

A generic hazard list includes issues and areas to consider when reviewing your agency's practices and when designing new service and facilities, or procuring new vehicles.

These lists give general guidance about possible safety hazards and issues related to specific areas, such as:

- Functional hazards,

- Electrical hazards,

- Fueling hazards,

- Mechanical hazards,

- Pneumatic and hydraulic hazards,

- Height and fall hazards,

- Temperature hazards, and/or

- Fire and flammability hazards.

These checklists may also include considerations for other topics, such as human error and/or ergonomics.

PTASP Technical Assistance Available Now

- Access one-on-one Agency Safety Plan support
- Learn and share through the PTASP Community of Practice
- Explore the PTASP Resource Library

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