



FEDERAL TRANSIT ADMINISTRATION

Safety Management System (SMS) Approach and FTA's Research Initiatives

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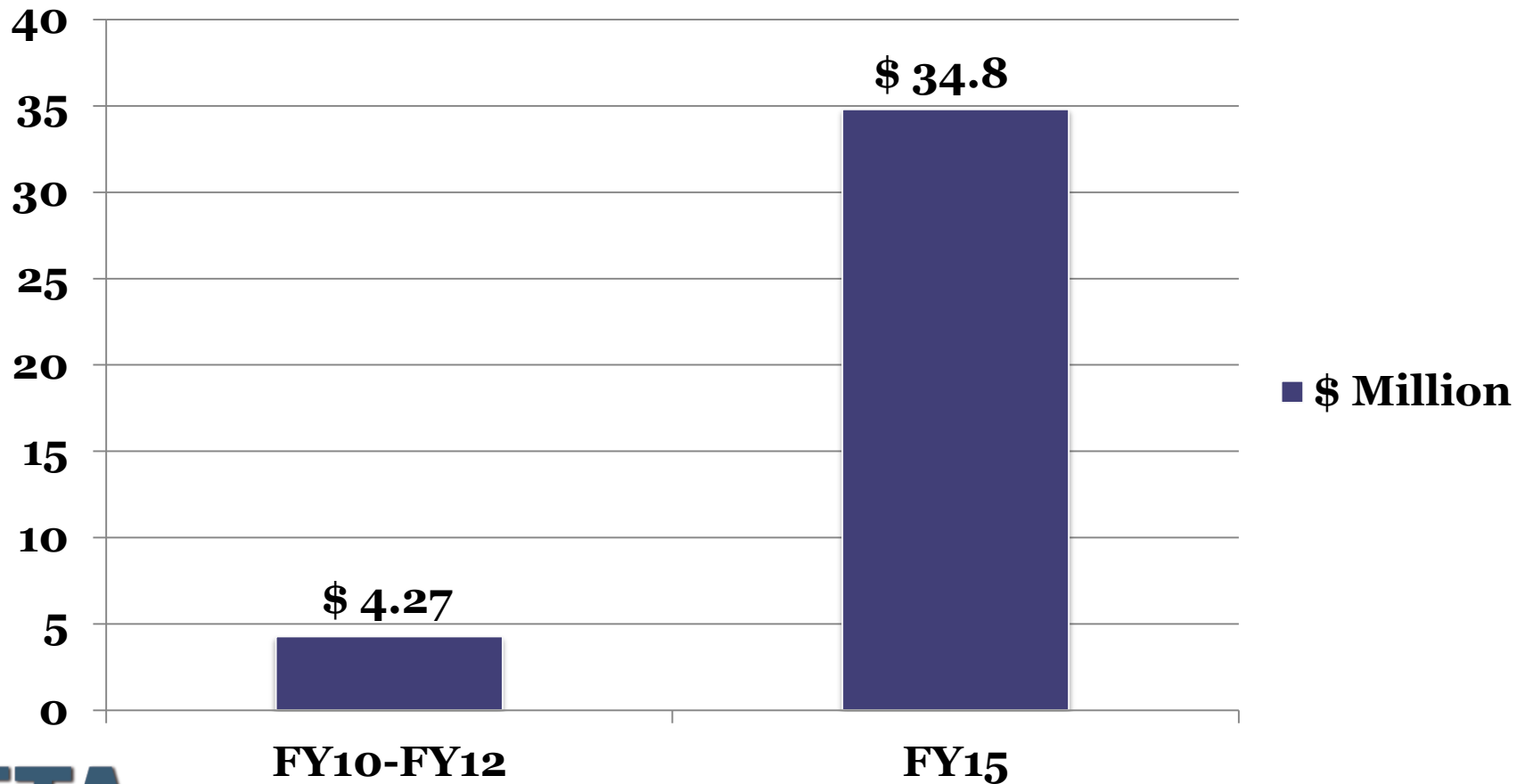
January 10, 2017

Overview

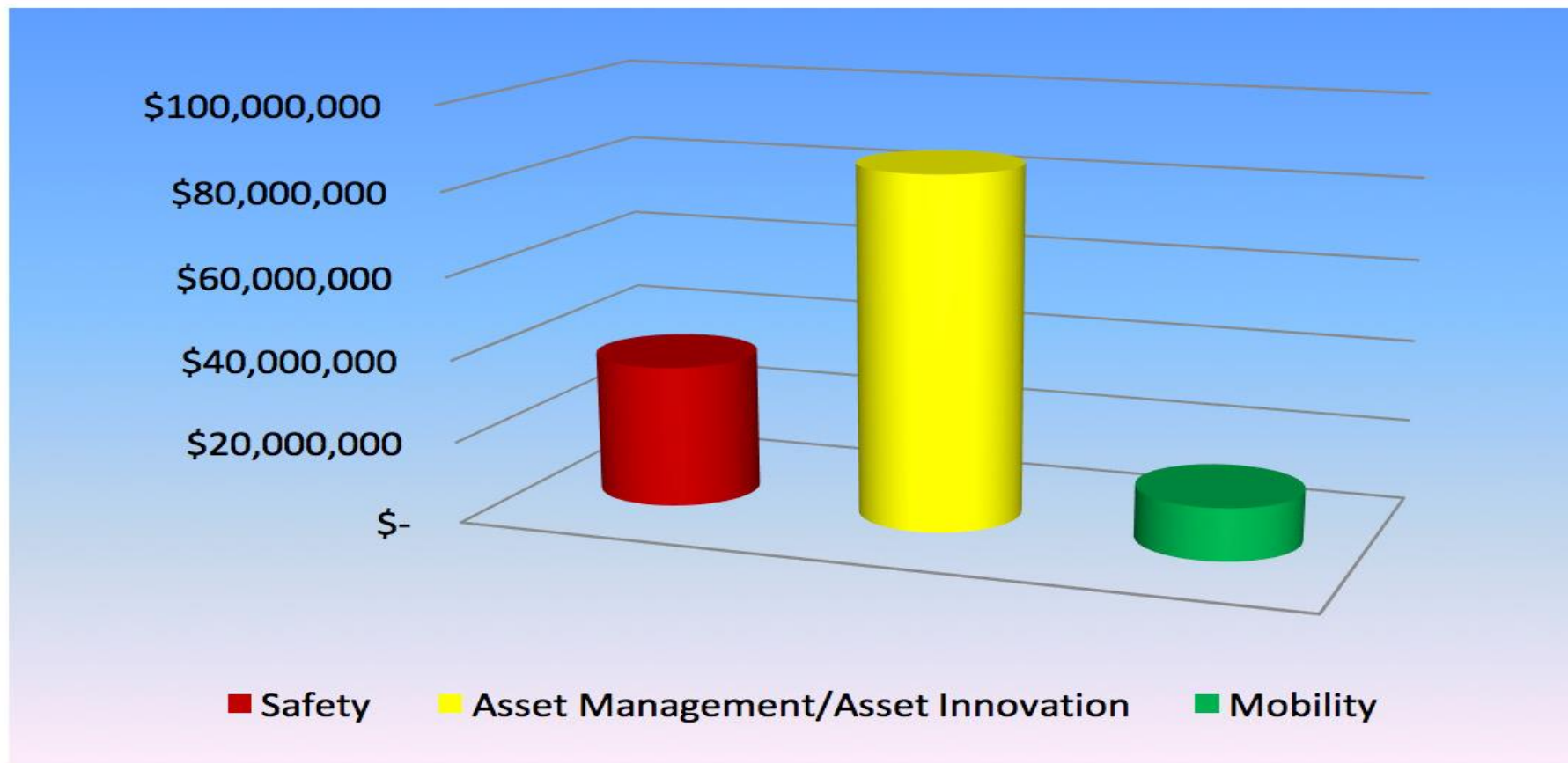
- Overview of Safety Research Program
- Safety Management System, Data and Research

Before and After

Safety Research Projects Funding



FY 2015 Research Funding



What is FTA researching in Safety?

- Crash Energy Management and Crashworthiness
- Collision Avoidance and Mitigation
- Transit Automation Program
- State of Good Repair and Resiliency
- Transit Worker Safety
- Employee Safety Reporting
- Safety Standards Development Program
- Etc.

SMS, Data and Research Initiatives

Safety Management System and Data



- SMS is a formal, top-down, data-driven, organization-wide approach to managing safety risk
- Data collection and analysis is critical to the success of any SMS system

Safety Data at National Level

- National Transit Database (NTD) and State Safety Oversight (SSO) program
 - Data collected are lagging indicators
 - Data collected are not granular enough
- FTA's ability to set National safety goals, identify mitigations and guide improvements in safety performance is dependent upon the collection of relevant safety data

Research Initiative #1

- FTA Acting Administrator has tasked TRACS to address Safety data collected by FTA (Task#16-02)
 - Actions and processes for improving existing safety performance measures
 - Development of recommended minimum requirements for collection of transit events
 - Recommendation on reporting Platform and functionalities

Research Initiative #2

- FTA Safety Standards Development Program
 - Inventory of relevant safety standards
 - Gap Analysis
 - Determine the efficacy
 - Determine the economic impact (rulemaking)

What about Data Protection?

- FTA does not have authority to protect certain information from public disclosure under FOIA
- FTA has made several requests to Congress for an exemption to disclose safety data collected for the purpose of implementing the safety program (Section 5329 of title 49, United States Code)

Research Initiative #3

- Evidentiary Protection of Public Transportation Safety Program Study
 - Required in Section 302I of Fast Act
 - National Academies of Sciences, Engineering and Medicine, TRB
 - Evaluate whether it is in the public interest to withhold from discovery or admission into evidence information related to the implementation of Public Transportation Safety Program (Section 5329)

Safety Data at Agency Level

- The purposed final rule for Public Transportation Agency Safety Plan has a requirement that a grant recipient develop an employee reporting program as part of its SMS implementation

Research Initiative #4

- Employee Safety Reporting Pilot Program
 - Volpe is assisting FTA to manage this pilot program
 - Formed a Stakeholder Working Group
 - Multiple pilot sites/multiple approaches
 - Guidance material for the industry
 - Evaluation of the effectiveness of different approaches

Questions?

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Safety Management System (SMS) Approach and FTA's Research Initiatives

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SMS Approach in FTA Standards Initiatives

- SMS – Safety Policy, Safety Risk Management, Safety Assurance, and Safety Promotion in FTA programs
- FTA's Safety Standards Strategic Plan
- FTA's Standards Development Program

SMS Process – FTA's Standards Program

- Risk Based Analyses
 - NTD data
 - Exposure based data analysis
 - Inventory of existing standards
 - Gap analyses
 - Industry input
- Scalable and Flexible Outcomes
 - Potential FTA issued regulations
 - Voluntary transit standards
 - Recommended practices
 - Guidance documents
 - Industry outreach/awareness

Safety Standards Strategic Plan

- Review and compile safety standards and protocols
- Perform a risk based safety data analysis to identify trends, areas of greatest safety risk, and provide the basis for recommending areas for standards/protocols consideration
- Industry input to help inform the project
- Identify subject areas for which FTA may issue standards and protocols
- FTA Safety Standards Strategic Plan – based on data analysis, review and compilation of safety standards, moderated planning sessions with working group (**initial focus areas for Standards Development Program**)

Data Centric Examination of Transit Safety Risks

- National Transit Database 2008 – 2014
- Examination of rates of injury and fatalities based on person exposure (NTD and NHTS National Household Travel Survey) – transit employees, transit passengers, other individuals
- Areas of greatest risk based on NTD examination
- Areas of greatest risk based on person exposure

Focus Area Identification

- Legislative/regulatory priorities
 - National Safety Plan
 - MAP-21 and/or FAST Act
 - FTA advisory issued
- Independent/advisory recommendations
 - TRACS or NTSB
- Data/research or public comment
 - NTD and NHTS data
 - Internal/project and external research
 - Public comments
 - Other industry input to the process
- Review of existing standards and regulations with gap analysis

Standards Development Program

- Address standards/regulations in accordance with **FTA Safety Standards Strategic Plan**
- Research and analysis:
 - New transit standards/regulations in areas where standards are lacking or gaps within existing standards
 - Existing standards/regulations deemed not adequate or not specific to transit that may be modified or enhanced
- Work with industry stakeholders to inform the standard development process
- Work with Standard Development Organizations to modify existing standards/regulations or develop standards for voluntary adoption

Questions?

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the Bus and Rail Transit Industry

16-01 Draft Letter Report



Purpose

- ❑ A strong safety culture empowers a transit agency at all levels to understand and proactively control risk in order to ensure the safety of passengers and employees
 - Implementing/fostering a strong safety culture is a challenging process that requires continuous improvement
- ❑ Research supports the notion that strong safety cultures lead to improved safety behaviors and safety performance of employees (Christian et al., 2009)

Definition

*“Safety culture is **shared values** (what is important to all public transportation system members who are responsible for safe, efficient revenue service) **and shared beliefs and attitudes** (how the transportation system works and what individual roles should be) **that interact with all system members, safety policies, procedures, and rules to produce behavioral norms** (the way we do our jobs, whether observed or not)”*

(TCRP Report 174, page 7)

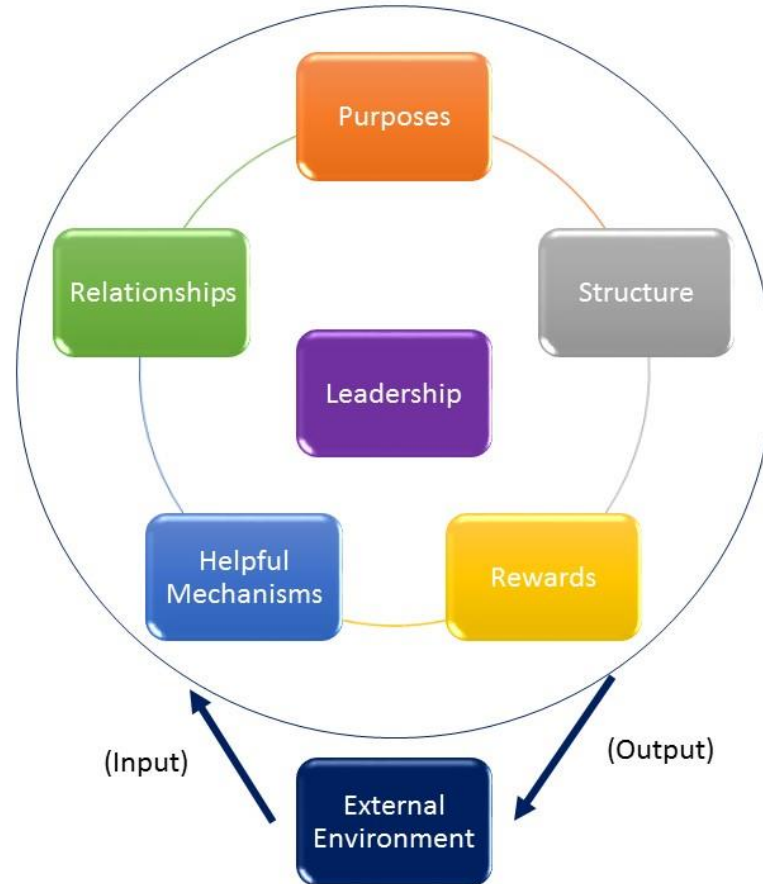
Elements of, and Barriers to, a Strong Safety Culture



Elements of, and Barriers to, a Strong Safety Culture

Strong Safety Culture	Weak Safety Culture
Safety is the top priority	Competing demands (e.g., on-time performance) are prioritized over safety
Leadership/management commitment	Weak/inconsistent commitment
Employee involvement/empowerment/motivation	Lack of employee involvement/empowerment/motivation
Open & effective communication	Breakdown in communication and information flow
Formal systems for data collection & non-punitive reporting of safety concerns	Focus on human error, lack of or no root-cause analysis
Trust between management & employees; fair treatment	Mistrust between management & employees; unfair treatment
Effective performance monitoring systems and standards	Routine non-compliance with safety rules, policies, & procedures
Adequate/effective training	Ineffective training methods/content
Continuous improvement	Lack of continuous improvement
Effective allocation of resources	Inadequate allocation of resources

Best Practices: Organizational Factors that Support a Strong Safety Culture



Best Practices: Organizational Factors that Support a Strong Safety Culture

Weisbord Model Element	Organizational Factors
Purposes	Agency mission/purpose emphasizes safety above all else
Structure	Present and active safety office
	Defined safety roles & responsibilities throughout the organization
Relationships	Trust
	Fair treatment
	Open & effective communication to resolve safety concerns
	Maintain working relationship with SSO & FTA
Rewards	Confidential, non-punitive, close-call reporting system
	Employee reporting without fear of retribution
	Continuous improvements
Helpful Mechanisms	Labor-management safety committees
	Learning culture through regular hazards analysis and lessons learned
	Management feedback on resolved safety concerns
Leadership	Strong leadership & management commitment to safety
	Effective allocation of resources
	Active involvement of front-line supervisors
External Environment	FTA, State and Local support

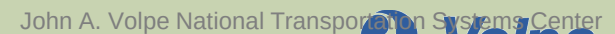
Recommendations

- ❑ Establish and promote labor-management safety committees within all transit agencies
- ❑ Establish confidential, close-call reporting systems within all transit agencies
- ❑ Develop an adaptable, usable safety culture assessment tool
- ❑ Support training at all levels of the transit agency on SMS principles, root-cause analysis, and the promotion of a positive safety culture
- ❑ Encourage regular safety communication within all transit agencies
- ❑ Encourage safety empowerment and evaluation within all transit agencies
- ❑ Encourage the proactive involvement of SSOs in SMS principles and positive safety culture for transit agencies

Four Pillars of SMS and Safety Culture

SMS Pillar	Safety Culture Elements
Safety Policies and Procedures	Leadership commitment Role clarity Just culture
Safety Risk Management	Prospective focus on risk Challenging key assumptions Flexible culture Safety as a priority Resiliency
Safety Assurance	Accountability Informed managers Communication and feedback Reporting culture Employee involvement and empowerment Continuous learning
Safety Promotion	Employee involvement and empowerment Leadership commitment Adequate training and resources Informed culture

16-02 Draft Letter Report



Purpose

- ❑ Determine the functional requirements and data elements of a comprehensive safety data collection and analysis framework to support improvements in the transit industry's safety performance

“You can’t manage what you can’t measure.”

~Peter Drucker

Safety Performance Measurement

- ❑ Safety performance measures are indicators that enable the organization and other stakeholders to monitor changes in safety conditions and performance against established visions, goals, and objectives.

Characteristics of Good Safety Performance Measures

Quantifiable

Representative of what is being measured

Consistent when measuring the same conditions

Detectable even when there are changes in environmental or behavioral conditions

Cost of obtaining/using measures is consistent with benefits

Easily understood by those who collect/analyze them

Data is capable of quality control and verification

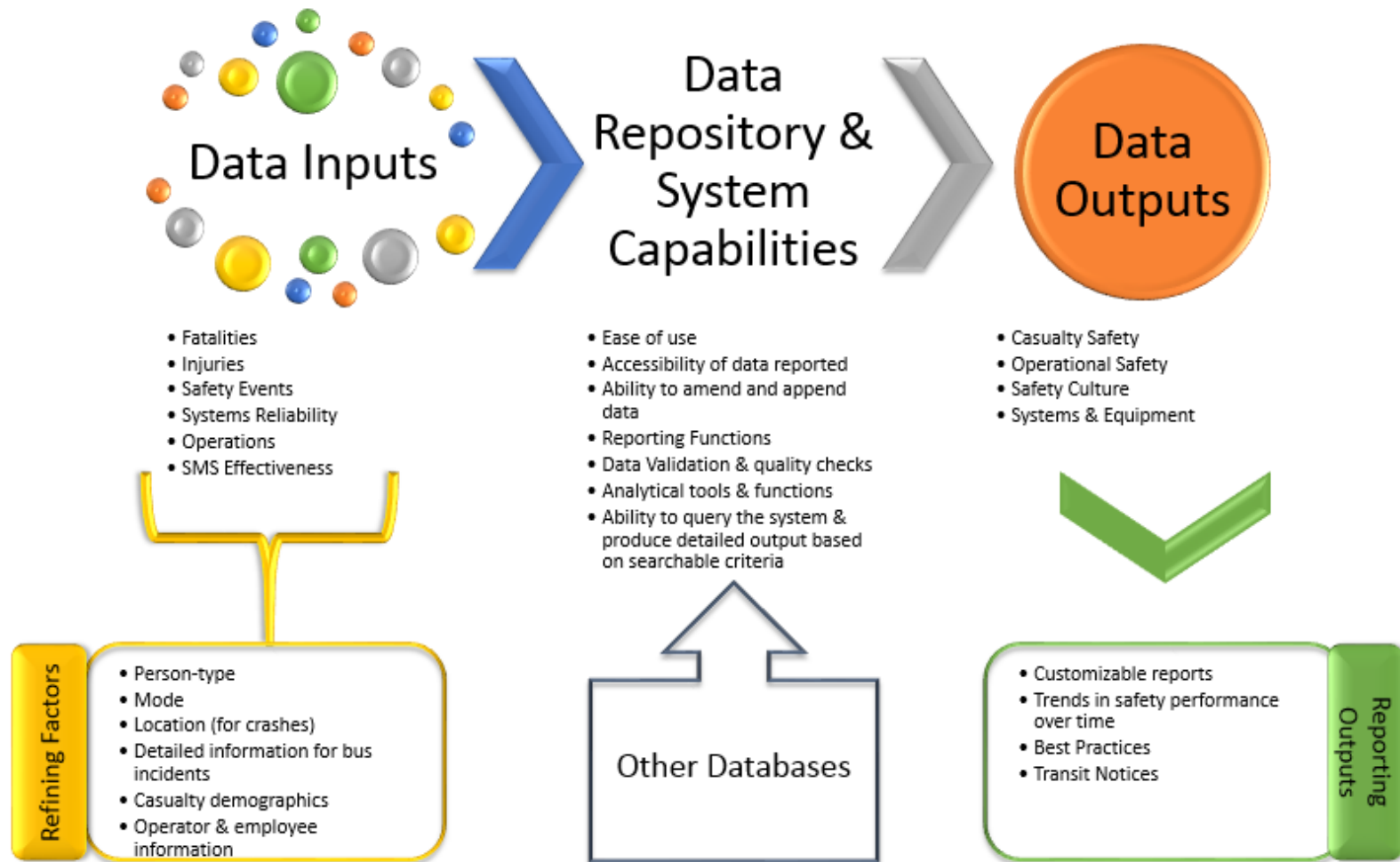
Total set of measures, metrics, and indicators should remain manageable

Key Principles in the Development and Use of Safety Performance Measures

- ❑ Measures reflect achievement towards safety performance goals and targets
- ❑ Measures reflect the current state of safety of the transit system
- ❑ Measures assess risk control effectiveness
- ❑ Voluntary safety data must protect the employee and agency from liability
- ❑ Measures should guide resource decision-making
- ❑ Safety performance indicators, data inputs, and reporting should be standardized across the industry

Safety Data and Performance Measures

Input-Process-Output Model



Data Repository & System Capabilities: An Improved Reporting Platform

- ❑ **Recommendation:** FTA should update the NTD or develop a new reporting system to support the ideal system functionalities to include:
 - Ease of use
 - Ability to query the system
 - Consistent data validation and quality check efforts
 - Ability to amend and append data as needed
 - Analytical tools and reporting functions

- ❑ **Recommendation:** FTA should provide guidance and clarity to transit agencies on requirements for collection of safety performance measures. There is concern from small and rural agencies that the number of safety measures proposed will be more burdensome to report given the low rates of crashes and fatalities they experience.

Desired Data and Reporting Outputs

Category	Measures
Casualty Safety	Crash Rate
	Passenger Safety
	Employee Work Days Lost to Injury
	Fires
	Derailments (Mainline & Yard)
	Evacuations for Life Safety
Operational Safety	Revenue Vehicles Exceeding Speed Limit
	Station Overruns
	Rule Violations
System & Equipment Safety	Road Calls
	Safety-Critical System Defects and Failures
Safety Culture	Positive Drug/Alcohol Tests
	Traffic Tickets Issued to Operators
	Close Calls

Questions?

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FEDERAL TRANSIT ADMINISTRATION

Mitigating Transit Worker Assault NPRM

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Federal Transit Administration

Overview

- FAST Act Requirement to write an NPRM on mitigating transit worker assault
- Held an Online Dialogue from June to August 2016
- TRACS researched the subject in 2014 – Task 14-01: Preventing and Mitigating Transit Worker Assaults in the Bus and Rail Industry

FAST Act Language

Sec. 3022. Improved Public Transportation Safety Measures.

- **REQUIREMENTS.** – Not later than 90 days after publication of the report required in section 3020, the Secretary shall issue a notice of proposed rulemaking on protecting public transportation operators from the risk of assault.
- **CONSIDERATION.** – In the proposed rulemaking, the Secretary shall consider –
 1. Different safety needs of drivers of different modes;
 2. Differences in operating environments;
 3. The use of technology to mitigate driver assault risk;
 4. Existing experience, from both agencies and operators that already are using or testing driver assault mitigation infrastructure; and
 5. The impact of the rule on future rolling stock procurements and vehicles currently in revenue service.
- **SAVINGS CLAUSE.** – Nothing in this section may be construed as prohibiting the Secretary from issuing different comprehensive worker protections, including standards for mitigating assaults.

Online Dialogue Recap

- Extended for one month to August 31, 2016 due to low participation rate
- Final Statistics: 57 topics/ideas, 86 comments, 565 votes, and 131 registered users (35 Active, 96 Non-Active)
- Major Categories of comments:
 - Training
 - Barriers
 - Fare Collection
 - Security Force/Police
 - Penalties
 - New Technologies
 - Data Accuracy
 - Rules of Conduct
- Received several unrealistic comments such as arming all bus drivers and having robots drive buses

TRACS Recommendations

- TRACS Report I4-01 Recommendations:
 - Implement Protective Infrastructure at Procurement Phase
 - Training
 - Public Education and Outreach
 - Support for Transit Workers
 - Data Collection
 - Enforcement

Data

- Transit worker assault data is not consistently reported due to multiple factors
- However, the data reported to NTD shows that from 2008 to 2014:
 - Overall transit assaults (including passengers and public) grew by 160.4 percent (from 321 events in 2008 to 836 events in 2014), as well as associated injuries in all modes
 - Operator and employee assaults for buses only have gone down over that time period as a percentage of total reported assaults:

	2008	2009	2010	2011	2012	2013	2014
Injuries – Transit Vehicle Operators	119	107	110	140	144	145	120
Operator percentages	51.1%	53%	42.5%	38%	32.1%	33.5%	28%
Injuries - Employees	17	6	14	16	16	16	16
Employee percentages	7.3%	3%	5.4%	4.3%	3.6%	3.7%	3.7%

NPRM Focus

- NPRM would follow the SMS approach that FTA is following and implementing
- SMS actions would follow and tie into the Public Transportation Agency Safety Plan and be scalable and flexible
- Transit agencies would do the work
 - States and SSOs cannot do this work on behalf of Transit Agencies
- Anticipate NPRM publication by mid-2017

Questions?

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