

**CUTR** **USF**  
UNIVERSITY OF SOUTH FLORIDA

  
U.S. Department of Transportation  
Federal Transit Administration

**Transit Data Presentation and  
FTA Standards Development  
Program Update**

Transit Safety and Operations Summit  
June 4, 2018

   **STANDARDS**  
Driving Innovation in  
Public Transportation

CENTER FOR URBAN TRANSPORTATION RESEARCH

## Presentation Outline

- Safety Standards Strategic Plan Elements
- Data Presentation
- Stakeholder Engagement
- Standards Development Program/Process
- Standards Development Program – Topics and Schedule Targets

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## Plan Elements



## Safety Standards Strategic Plan Elements

- Examination of Public Transportation Safety Risks
  - Data-Centric Examination
    - NTD
    - NHTS w/NTD – analysis of person exposure
    - FARS
    - FTA Rail Safety Statistics Report
    - State of Bus Safety in the US
    - Summary of Findings
  - Investigation Reports and Research Findings



## Safety Standards Strategic Plan Elements

- Public Transportation Safety Focus Areas for Consideration (established through data analyses and associated research)
- Industry/Stakeholder Engagement
  - CUTR/FTA Transit Standards Working Group
  - Industry Input in Response to the Compendium
  - Other Industry Engagement
- Recommendations



## Data Presentation – General Findings



## Heavy Rail Findings

- 41.2% heavy rail fatalities are trespassers
- 23.0% heavy rail fatalities are people waiting/leaving
- 94.3% heavy rail fatalities and 66.7% of heavy rail injuries are due to collisions with persons
- Injuries to people waiting/leaving increased by 13 fold (6 in 2008 to 79 in 2016)
- Transit vehicle rider injuries experienced an annual increase of 25.1% from 2008 to 2016
- Fatalities to people waiting/leaving increased by 38.0% annually from 2008 to 2016



## Light Rail Findings

- 86.6% of light rail fatalities are due to collisions with persons
- The majority (68.2%) of all fatal collisions occur while the light rail vehicle is traveling straight and 52.9% involve head-on collisions
- 73.0% of all light rail injuries occur while the light rail vehicle is traveling straight and 69.6% occur at roadway grade crossings
- Injuries sustained from light rail grade crossing collisions increased 15.9% from 2008 through 2016
- Half of all light rail injuries are to injuries to light rail vehicle passengers



## Bus Findings

- 52.3% of fatalities are collisions with persons, and 45.7% are collisions with motor vehicles
- Nearly half of all bus fatalities occur at intersections
- 41% of all bus fatalities are to the occupants of other vehicles
- 53.7% of all bus injuries occur at intersections and
- The majority (61.3%) of all bus injuries are to bus occupants and 23.1% are due to rear-ended collisions
- Rear-ended collisions have increased 74.6% from 2008 to 2016

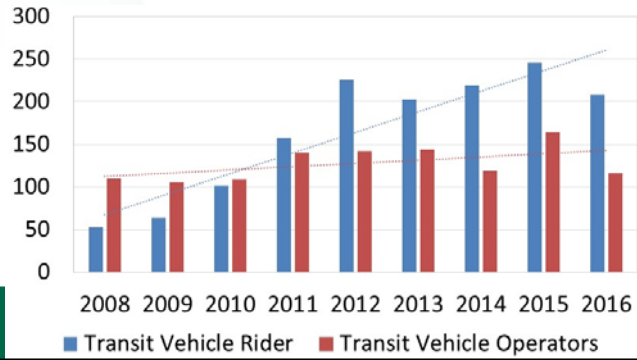
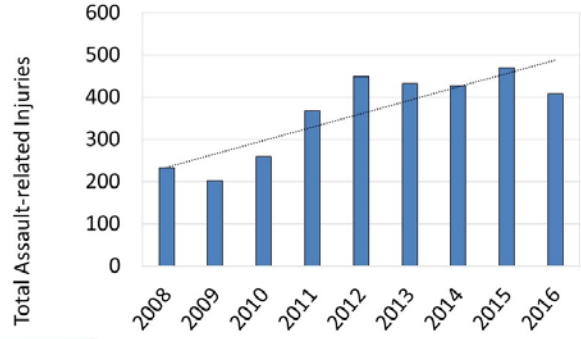


## Demand Response Findings

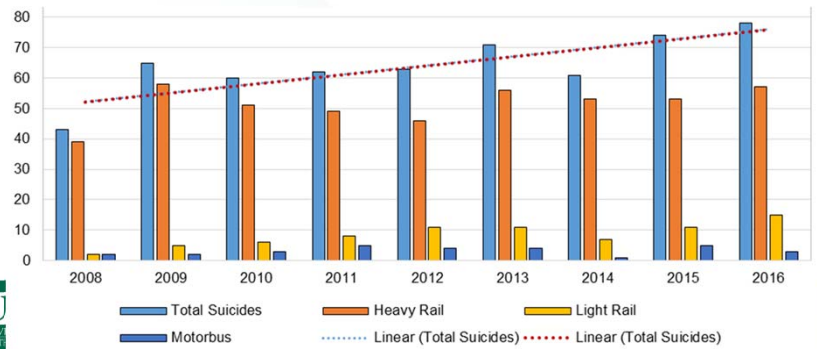
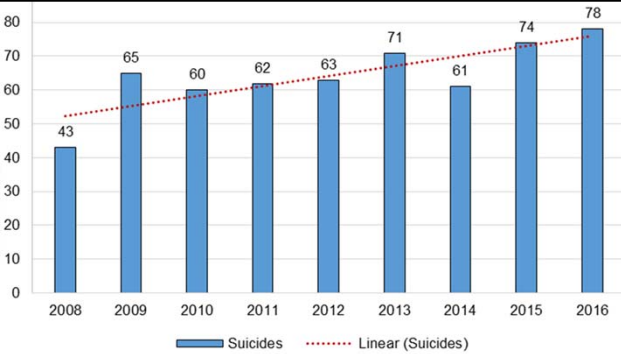
- 77.1% fatalities and 89.7% injuries are due to collisions with motor vehicles
- 72.9% of all fatalities and 57.2% of all injuries were sustained while the demand response vehicle was traveling straight
- Rear-ended collisions account for 18.8% of all fatalities and 30.1% of all injuries
- Rear-ended major events increased 70.3% between 2008 and 2016



## Security Event Findings - Assaults



## Security Event Findings - Suicides in Rail



## Focus Area Identification

- Legislative/regulatory priorities
  - MAP-21 and/or FAST Act
  - FTA Safety Advisory or Directive issued
- Data/research or public comment
  - Internal/project and external research
  - Public comments
  - Other industry input to the process
- Independent/advisory recommendations
  - TRACS or NTSB
  - CUTR/FTA Transit Standards Working Group
- 25 initial areas of focus



## Safety Focus Areas – Bus and Rail

- |   |   |
|---|---|
| ▪ Close call reporting                    | ▪ Emergency preparedness                        |
| ▪ Accident/incident investigation         | ▪ Operational rules, practices, and procedures  |
| ▪ Emergency preparedness                  | ▪ Passenger vehicle workstations                |
| ▪ Fire-life safety                        | ▪ Passenger vehicle safety                      |
| ▪ Medical fitness for duty                | ▪ Rail maintenance-of-way equipment             |
| ▪ Fatigue risk management                 | ▪ Rail signals and communication systems        |
| ▪ Employee assault prevention             | ▪ Rail track and structures                     |
| ▪ Internal SMS evaluation/ assessment     | ▪ Rail tunnels                                  |
| ▪ Event data recorders                    | ▪ Rail traction power electrification equipment |
| ▪ Rail/highway grade crossings            | ▪ Rail vertical transportation equipment        |
| ▪ ROW worker protection                   | ▪ Vehicle (bus) safety and maintenance          |
| ▪ Training                                | ▪ Safety risk management processes              |
| ▪ Transit operations control centers      |   |
| ▪ Transit scheduling/operator break times |   |





## Stakeholder Engagement



## Industry Stakeholder Engagement

- FTA Compendium webinars and Federal Register notice for comments – May 2016
- Project/program presentations
  - 2017 TRB Annual Meeting
  - 2017 and 2018 APTA Bus and Paratransit Conference – Bus Safety Committee meeting
  - 2017 APTA Rail Conference – Rail Safety Committee meeting
  - 2017 APTA Safety Coordinating Committee – Annual Meeting and EXPO
  - 2017 APTA Mid Year Meeting
- CUTR/FTA Transit Standards Working Group
  - February 2017 – Tampa
  - June 2017 – TTCL, Pueblo, CO
  - November 2017 – Tampa
  - February 2018 – MARTA Headquarters, Atlanta, GA
  - July 2018 – SEPTA, Philadelphia, PA







**CUTR/FTA Transit Standards Working Group**



## CUTR Working Group Members

- Tracey Hamer, TriMet
- Ni Lee, BART
- Jim Fox, SEPTA
- Ron Nickle, MBTA
- Paul Goyette, Lee Tran
- Rich Czeck, GCRTA
- Vijay Khawani, LA Metro
- Tom Lamb, MTA/NYCT
- Patrick Moore, Greeley-Evans Transit
- Susan Hausmann, TxDOT
- Pat Lavin, WMATA
- Colin Mulloy, HART
- Abhay Joshi (AJ), MARTA
- Narayana Sundaram, APTA
- Brian Alberts, APTA
- Charlie Dickson, CTAA
- Ed Watt, ATU
- Robin Phillips, NRTAP
- Stephan Parker, TRB



## CUTR Transit Standards Working Group

- Roles:
  - Identify areas of greatest risk within their properties and across the industry
  - Provide technical support to research team
  - Provide input to transit focus area research
  - Verify/validate research results
  - Provide input on research recommendations
  - Identify areas of potential risk
- Moderated WG meet quarterly
- Focus area research subcommittees meet as required
- Supported by CUTR Team: Transportation Technology Center, Inc. (TTCI) and K&J Consulting Services, Inc.



### WG Final Prioritization List – Rail

Original #	FOCUS AREA TOPIC - RAIL	Score	Rank
20	Right-of-Way Worker Protection	234	1
2	Close-Call Employee Reporting Systems	182	2
16	Rail Track and Structure Safety	136	3
13	Passenger Vehicle Safety	128	4
15	Rail Signal and Communication System Safety	126	5
19	Rail/Highway/Pedestrian Grade Crossing	121	6
22	Training	96	7
21	Safety Risk Management	93	8
26	Tunnel Design	87	9
9	On-board Event Data Recorders	79	10
5	Fire-Life Safety	70	11
6	Medical Fitness for Duty	70	11
11	Operational Rules, Practices and Procedures Compliance Programs	67	13
27	Fatigue Risk Management	66	14
1	Accident/Incident Investigation	62	15
4	Emergency Preparedness Programs	51	16
3	Distraction Prevention Programs	47	17
23	Transit Operations Control Center	45	18
17	Rail Traction Power Electrification System	42	19
24	Transit Schedule/Operator Break Time	42	19
12	Passenger Vehicle Operator Work Station Design	39	21
18	Rail Vertical Transportation Equipment (Heavy-Duty)	31	22
14	Rail Maintenance-of-Way Equipment	29	23
7	Front Line Employee Assault Prevention	25	24
8	Internal Safety Mgmt System Evaluating, Assessment, Auditing	22	25
25	Vehicle (Bus) Safety and Maintenance	21	26
10			

**WG Final  
Prioritization  
List – Bus**

Original #	FOCUS AREA TOPIC - BUS	Score	Rank
2	Close-Call Employee Reporting Systems	279	1
13	Passenger Vehicle Safety	264	2
7	Front Line Employee Assault Prevention	255	3
6	Medical Fitness for Duty	227	4
3	Distraction Prevention Programs	225	5
22	Training	218	6
9	On-board Event Data Recorders	211	7
25	Vehicle (Bus) Safety and Maintenance	200	8
1	Accident/Incident Investigation	167	9
11	Operational Rules, Practices and Procedures Compliance Programs	144	10
21	Safety Risk Management	142	11
24	Transit Schedule/Operator Break Time	139	12
12	Passenger Vehicle Operator Work Station Design	125	13
27	Fatigue Risk Management	108	14
8	Internal Safety Mgmt System Evaluating, Assessment, Auditing	91	15
23	Transit Operations Control Center	80	16
4	Emergency Preparedness Programs	72	17
5	Fire-Life Safety	62	18
20	Right-of-Way Worker Protection	8	19
26	Tunnel Design	8	19
14	Rail Maintenance-of-Way Equipment		
15	Rail Signal and Communication System Safety		
16	Rail Track and Structure Safety		
17	Rail Traction Power Electrification System		
18	Rail Vertical Transportation Equipment (Heavy-Duty)		
19	Rail/Highway/Pedestrian Grade Crossing		
10			

**Standards Development  
Program/Process**



## Standards Development Program

- Focus area research:
  - Emergency Lighting/Signage (rail)
  - Event Data Recorders (rail and bus)
  - Crashworthiness/Crash Energy Management (rail and bus)
  - Rail Tunnels
  - Light Rail Collisions
  - Track Inspection and Maintenance
  - Light Rail Technology Scan and Case Studies
  - CEM of <30' Buses



## Standards Development Program

- Current focus area research – NTSB recommendations to FTA:
  - Inward/outward facing recording devices
  - Event data recorders
  - Transmission based train control
  - CEM for rail to prevent telescoping
  - Evacuations in rail tunnels
  - Rail tunnel inspection and maintenance



## Standards Development Program – Process

- Research team – CUTR and TTCI will complete focus area research on NTSB recommendation topics with CUTR Working Group input
- Research team (CUTR and TTCI) will present draft final topic reports to FTA for review and editing
- Final reports issued to APTA for standards development/update
- Research team available for technical assistance/support to APTA during standards development process



## Standards Development Program – Topics and Schedule Targets

Topic Area/Mode	Target Completion Date
Event Recorders for Rail Transit Systems – TTCI	Completed
Emergency Lighting and Signals for Rail Transit – TTCI	Completed
CEM/Crashworthiness (HR, LR, Streetcar) – TTCI	Completed
CEM/Crashworthiness for Transit Buses – CUTR	Completed
EDRs for Transit Bus – CUTR	Completed
Rail Tunnels – TTCI	Completed
Fitness for Duty and Fatigue Management – CUTR	(on HOLD)
Crashworthiness of “Less than 30 Feet” Buses – CUTR	July 31, 2018
Track Standards for Inspection and Maintenance	May 31, 2018
Light Rail Grade Crossings and ROW Access	October 31, 2018
Research to Support Decision Making on TBTC	TBD
Research to Support Standards Development for Inward/Outward Facing Recording Devices	Jun 30, 2018
APTA Standard for Inward/Outward Facing Recording Devices	March 31, 2019
APTA Standard for EDR for Rail Transit Vehicles	TBD
APTA Standard for CEM for Rail Transit Vehicles	TBD
APTA Standard for Transmission Based Train Control	TBD

## Standards Development Team



- Lisa Staes
- Jodi Godfrey
- SMEs



- MaryClara (MC) Jones
- Firdausi (Dose) Irani
- SMEs



- Narayana Sundaram
- Eugene Reed

