Human Factors Research

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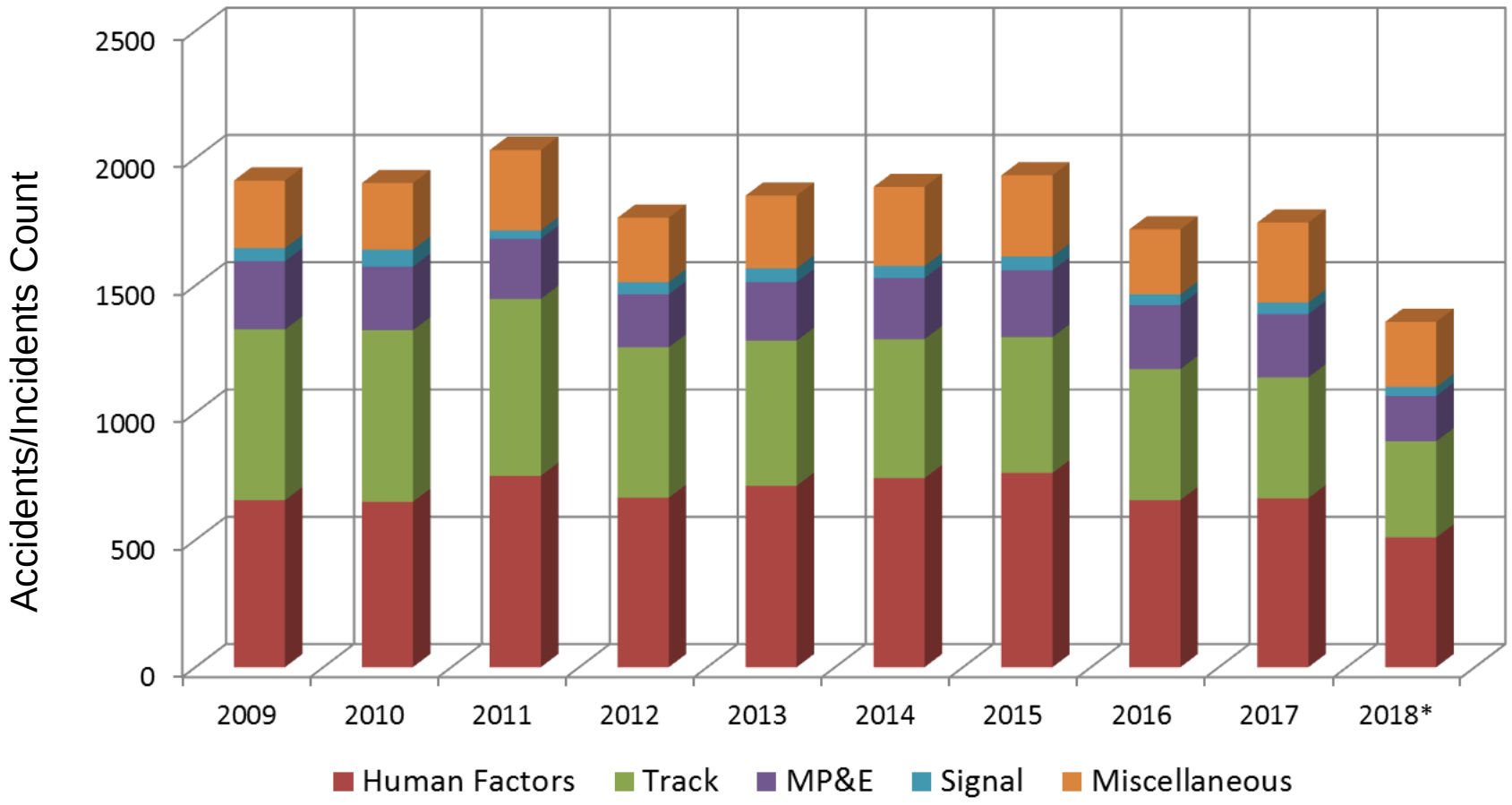
FRA RD&T Transportation Research Board Review



*Accident/Incident data current through 9/30/2018
Source: FRA Office of Safety Database (12/03/2018)

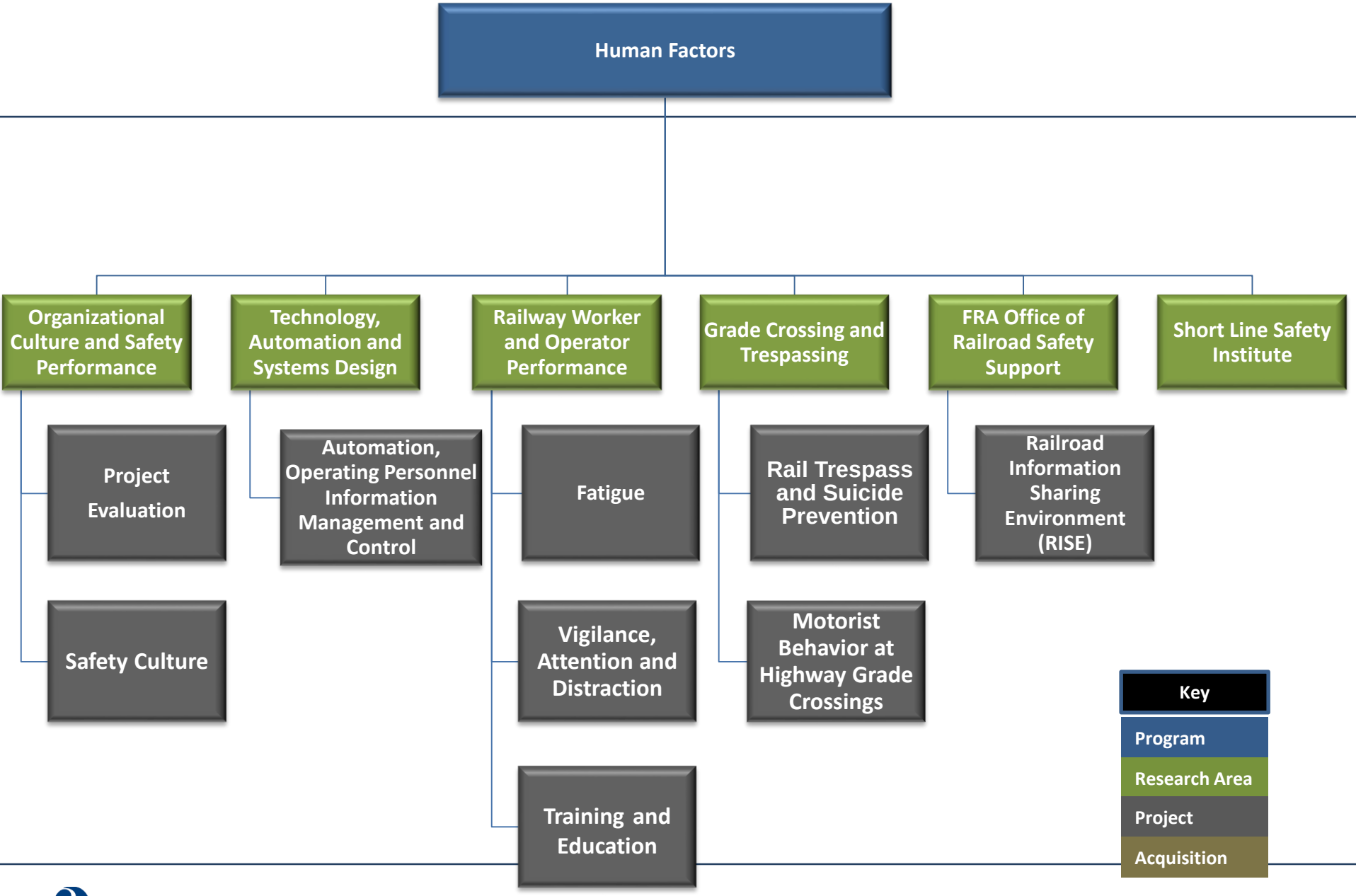
Human Factors Research Division

Focus: Address accidents caused by human error, the most common cause of railroad accidents.

Core Research Priorities:

- Organizational Culture and Safety Performance
- Technology, Automation and Systems Design
- Grade Crossing Safety and Trespass/Suicide Prevention
- FRA Office of Railroad Safety Support
- Monitoring and Support to Short Line Safety Institute (SLSI)

Support DOT Strategic Goals:
Safety, Infrastructure, Innovation and Accountability


Human Factors
Organizational Culture and Safety Performance
Technology, Automation and Systems Design
Railway Worker and Operator Performance
Grade Crossing and Trespassing
FRA Office of Railroad Safety Support
Short Line Safety Institute
Project Evaluation
Safety Culture
Automation, Operating Personnel Information Management and Control
Fatigue
Vigilance, Attention and Distraction
Training and Education
Rail Trespass and Suicide Prevention
Motorist Behavior at Highway Grade Crossings
Railroad Information Sharing Environment (RISE)
Key
Program
Research Area
Project
Acquisition

Stop Signal Overrun Good Practices Guide

What problem was addressed:

- The study identified factors that contributed to stop signal overruns (SSOs).
- SSOs occur when a rail transit vehicle fails to stop as required in advance of a stop signal, flag, or other indicator.
- Understanding why, how, and when they occur, the study offered recommendations for mitigating these events.

What was learned: Most often, SSOs are caused by multiple interacting factors: physical environment, individual and team behavior, regulatory activities, and railroad organizational processes.

Results: A "Good Practices Guide" was developed. This guide is non-regulatory, and intended to be used by passenger railroads concerned with stop signal overruns.

Research is ongoing

Total Project Cost: $358,090
Project End Date: 2/2019
Non-Federal Support: Approximately 558 hours of research support provided by railroads

Driver Behavior at Grade Crossings Using Naturalistic Driving Study Data and Driving Simulators

What problem was addressed: The study examined motorists' behavior at grade crossings and drivers' responses to different traffic control devices at grade crossings using Naturalistic Driving Study (NDS) data.

What was learned: The investigation revealed that most drivers do not visually scan for trains and do not prepare to stop, regardless the type of warning device present at the crossing, or the environmental conditions that prevail at the time of traversal.

Results: The research outputs were a Technical Report and presentations to FRA's Grade Crossing Task Force, TRB and numerous transportation and academic conferences.

Operation Lifesaver, Inc.

Research is ongoing

Total Project Cost: $271,223
Project End Date: 9/2018
Non-Federal Support: Michigan Technological University leveraged $112K from the National University Rail Center

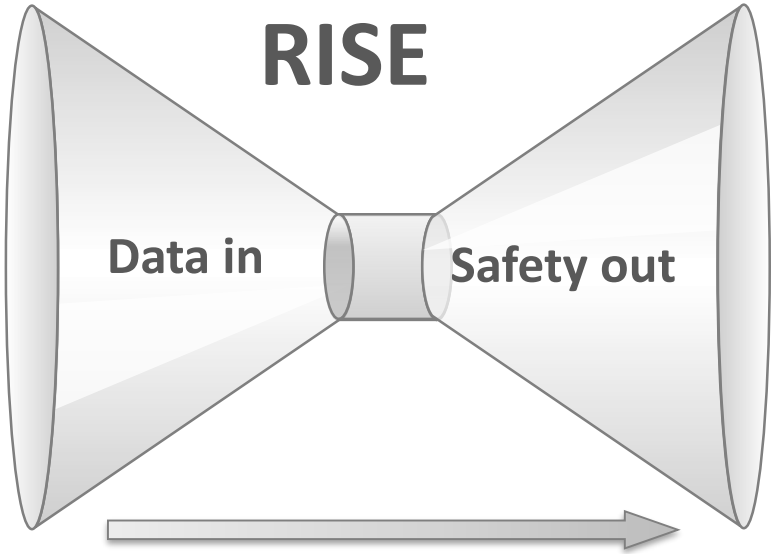
Railroad Information Sharing Environment (RISE)

Description:

- Create an information-sharing partnership between FRA and industry to share safety data for the purpose of mitigating safety problems.
- RISE can help identify interdependencies between different parts of the railroad system that create unsafe conditions but may not be evident

Objective:

- Determine whether this partnership can better collect and analyze safety data given growing complexity and increasing quantity of data available for railroads.



Research is ongoing

Expected Outcomes:

- Pooled resources to inform decision-making and mitigate safety problems.
- The program may improve safety by: identifying a previously unknown issue or precursor from data analysis, focusing on a particular topic of interest and monitoring data for issues, and/or identifying a topic that needs in-depth study.

Human Factors CTIL Stakeholder Meeting

Purpose:

- January 2019: held a stakeholder meeting to facilitate mutual learning across Cab Technology Integration Laboratory (CTIL) stakeholders
- Gather research ideas and better understand human factors concerns regarding technology and its integration into operating practices
- Provide insight into the simulation and automation capabilities of CTIL to meet a wide range of stakeholder needs

https://www.fra.dot.gov/ctil
See the CTIL Strategic Plan and stay abreast of CTIL news and updates.

Outcomes:

- Garnered High Interest: Attended by 12 stakeholders ranging from railroads, railroad equipment manufacturers, labor unions, and AAR
- Informed Research Topics: Identified operational safety issues related to partial automation and in-cab technologies more broadly to be incorporated in RD&T's research proposals
- Ongoing Stakeholder Exchange: Participants voiced value of the discussion and continued engagement (potential late Summer meeting)

Stakeholder Engagement Case Study: Workshops

Workshops:

- Right-of-Way Fatality & Trespass Prevention
- Grade Crossing Research Needs

Goal: Identify and share existing industry best practices and explore new strategies to improve grade crossing safety and prevent trespassing along the railroad ROW

- Stakeholders help FRA identify and prioritize specific research needs.
- Attendees include:
  - Class I, II, & III Railroads
  - State & Local DOTs
  - Commuter Rail
  - Academia
  - Nonprofits
  - Labor Unions
  - Private Industry

Broad Agency Announcement

Research Initiatives in Support of Rail Safety

- Trespass Prevention and Suicide
- Grade Crossing Safety
- Fatigue
- Automation
- Rail Worker Protection

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Thank You

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