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Railroad Information Sharing Environment (RISE): Program Attributes, Lessons Learned, and Opportunities for Expanded Future Impact



Railroad Information Sharing Environment

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14. ABSTRACT The Railroad Information Sharing Environment (RISE) is a voluntary, non-regulatory, non-punitive, data-driven safety partnership consisting of railroad stakeholders, including the Federal Railroad Administration (FRA), to advance railroad safety. Through a data trust, railroad stakeholders voluntarily share data and work collaboratively to address complex railroad safety challenges. Between October 2024 and March 2025, FRA contracted MITRE Corporation (MITRE) to review the RISE program to assess and document lessons learned and identify opportunities to expand the data trust and the impact of RISE. The research team reviewed RISE program documentation, interviewed RISE stakeholders, and assessed the functionality of RISE in relation to similar programs operating a data trust.						
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Executive Summary

In 2018, Federal Railroad Administration (FRA) leadership tasked FRA's Office of Research, Development, and Technology to establish the Railroad Information Sharing Environment (RISE) program. RISE is a voluntary, non-regulatory, non-punitive, data-driven safety partnership consisting of railroad stakeholders, including FRA, to advance railroad safety. Through a data trust, railroad stakeholders voluntarily share data and work collaboratively to address complex railroad safety challenges [3].

Between October 2024 and March 2025, FRA contracted The MITRE Corporation (MITRE) to review the RISE program to assess and document lessons learned and identify opportunities to expand the data trust and the impact of RISE. The research team reviewed RISE program documentation, interviewed RISE stakeholders, and assessed the functionality of RISE in relation to similar programs operating a data trust.

Key findings of this research include:

1. **RISE Program Attributes.** Through two phases of work, RISE has led to important research results and has demonstrated the potential of shared information, such as the personal injuries benchmarks in Phase 1 and the humped crossings dashboard in Phase 2.
2. **Lessons Learned.** Work to date points to specific needs to advance RISE to the next stage, including:
 - What is RISE? – ensuring participating stakeholders possess a clear understanding of the opportunity and value of a data trust.
 - Trust and Data Protection – building the documentation and the confidence that data shared in the program will be protected as confidential and that reports and analyses will be released only after approval by the RISE Executive Board (EB).
 - Value of RISE – structuring research goals to deliver stakeholder value and in turn advance program goals.
3. **Opportunities for Expanded Impact.** RISE is well positioned to advance and realize significant, positive contributions to railroad safety. Recommended next steps to do so include:
 - Communicating RISE's Differentiated Value – dispelling any confusion between the various FRA safety programs and activities.
 - Industry Leadership – re-engaging senior leadership, including regular convenings of the RISE EB, to provide strategic direction, prioritize RISE activities, advance research, ensure confidentiality of sensitive information, and communicate RISE results to appropriate parties within FRA and industry.
 - Ensure Commitment to Data Sharing – addressing lingering uncertainty about data confidentiality protections among industry stakeholders.
 - Establish a Research Program – building incrementally through targeted research topics and growing to address the larger, more complex challenges over time.

1. Introduction

Between October 2024 and March 2025, FRA contracted The MITRE Corporation (MITRE) to review the RISE program to assess and document lessons learned and identify opportunities to expand the data trust and the impact of RISE. The research team reviewed RISE program documentation, interviewed RISE stakeholders, and assessed the functionality of RISE in relation to similar programs operating a data trust.

1.1 Background

In 2018, FRA leadership tasked FRA's Office of Research, Development, and Technology to establish the RISE program. RISE is a voluntary, non-regulatory, non-punitive, data-driven safety partnership consisting of railroad stakeholders, including FRA, to advance railroad safety. Through a data trust, railroad stakeholders voluntarily share data and work collaboratively to address complex railroad safety challenges [3].

A data trust is a tool for sharing sensitive data among trust members for advancing safety or other public benefits when there might otherwise be strong disincentives or significant roadblocks to sharing. Data trusts are administered by a trusted third party (i.e., data steward) whose duty is to protect members' data and thus enable sharing that would otherwise not occur.¹ Examples of programs leveraging a data trust include the Federal Aviation Administration (FAA) Aviation Safety Information Analysis and Sharing (ASIAS) program [1] and the National Highway Traffic Safety Administration (NHTSA) Partnership for Analytics Research in Traffic Safety (PARTS) program [6].

From May 2019 to March 2021, FRA conducted a pilot project to test the feasibility of RISE. Five commuter railroads volunteered to participate. In the pilot project, the stakeholders identified personal injuries as a specific topic to investigate. Stakeholders benchmarked their organization's reportable and non-reportable personal injuries against their peers' data. Results of the RISE pilot project are documented in two technical reports: *Railroad Information Sharing Environment (RISE)* [4] and *Lessons from the Railroad Information Sharing Environment (RISE) Pilot Project* [5].

In Phase 2 of RISE, FRA and stakeholders identified three safety topics that might benefit from data sharing: humped crossings (i.e., highway-rail grade crossings with high vertical profiles), trespassing near misses, and grade crossing safety. For each safety topic, stakeholders established an Issue Analysis Team (IAT), a smaller working group comprised of stakeholders with mutual interest and data to inform a particular safety topic.

Each IAT has a Data Management Plan (DMP) that describes how stakeholders will share data with the RISE data steward and the data protections associated with that data sharing agreement. The University of Maryland (UMD) Center for Advanced Transportation Technology Laboratory (CATT Lab) serves as the RISE data steward.

¹ In January 2021 the United States (US) Department of Transportation (DOT) Order 1371.1 [9] established DOT's policy on the use of data trusts and identified key roles and associated responsibilities for DOT personnel.

1.2 Objectives

The objectives of this research include:

1. Advance and mature RISE to implementation ready as a data trust for the railroad industry, consistent with US DOT Order 1371.1 Data Trust Policy, Guidelines and Principles.
2. Demonstrate RISE value through successful delivery and use of results from Phase 2 of the RISE pilot.
3. Facilitate convenings of suppliers and developers of geospatial technology and ground transport companies, as well as railroad stakeholders, to advance grade crossing safety.

1.3 Overall Approach

The work for this research was executed through review of existing RISE and similar data trust program documentation, interviews with RISE program management and stakeholders, and interviews with program staff for similar data trust programs. This information was compiled and shared throughout the course of the research, leading to continued refinements to understanding and recommendations.

1.4 Scope

This technical report covers the research team's assessment of RISE program attributes, lessons learned, and opportunities for expanded future impact.

1.5 Organization of the Report

[Section 2](#) describes the program's key features, organization and documentation. [Section 3](#) summarizes lessons from program operations to date. [Section 4](#) describes opportunities for future applications. [Section 5](#) provides concluding remarks.

2. RISE Program Attributes

In 2018, FRA leadership tasked FRA's Office of Research, Development & Technology to build a data trust for the railroad industry. FRA established the RISE program to be a voluntary, non-regulatory, non-punitive, data-driven safety program consisting of railroad stakeholders, including FRA, to advance railroad safety. Through the RISE program, railroad stakeholders can voluntarily share data into a data trust and work collaboratively to address complex railroad safety challenges.

Phase 2 of RISE was organized around three key categories of stakeholders:

1. **Government:** FRA serves as the government agency tasked with establishing the RISE program and its enabling data trust. FRA, with support from the Volpe National Transportation Systems Center (Volpe), led outreach efforts with railroads and spearheaded Phase 1 and Phase 2 of RISE.
2. **Independent Data Steward:** UMD's CATT Lab is the independent/third-party data steward for RISE. As the data steward, CATT Lab is the operator of the RISE data trust and has been responsible for receiving, storing, protecting, and analyzing data provided by railroads to address identified safety issues.
3. **Industry:** Railroads, labor unions, and other bodies such as state transportation organizations have participated in RISE through data and/or information sharing.

A charter defines the program's core operating principles and procedures that govern RISE operations. The charter describes the role and responsibilities of the RISE Executive Board (EB), defines the safety issue selection process and subsequent formation of an IAT, and details data management principles.

RISE efforts have advanced in two separate phases:

1. Phase 1 (2019-2021): RISE stakeholders conducted a pilot project to test the feasibility of the RISE program and a railroad safety data trust.
2. Phase 2: (2022-present): RISE stakeholders convened to identify three focal safety topics: humped crossings (i.e., highway-rail grade crossings with high vertical profiles), trespassing near misses, and grade crossing safety.

The activities undertaken in each phase are summarized below.

2.1 Phase One

Phase 1 of RISE, executed by a program team comprised of FRA, Volpe, and CATT Lab, began in May 2019 and continued through 2021.

In this initial phase, the program team convened five passenger railroads and identified relevant safety topics for study. Collectively, the group identified and selected personal injuries as the focus topic. FRA, Volpe, CATT Lab, and the railroads created and signed a charter to provide a governing framework for this pilot phase. Industry champions (e.g., Ken Highlander from Amtrak and Patrick Warren from Metropolitan Transportation Authority [MTA]) at the time were instrumental in facilitating industry convenings and participation in RISE Phase 1.

RISE stakeholders investigated personal injuries in the Phase 1 analysis, providing the industry with benchmarks of reportable and non-reportable personal injuries against their peers. Results of RISE Phase 1 are documented in previous reports [4] [5].

2.2 Phase Two

Phase 2 of RISE began in 2022. In RISE Phase 2, the team introduced an initial program governance structure, including identifying industry leaders to serve on the RISE EB. As in Phase 1, the program team convened with industry stakeholders and identified relevant safety topics for study. Collectively, the group identified and selected three focal safety topics:

1. Humped crossing safety (i.e., highway-rail grade crossings with high vertical profiles)
2. Trespassing near misses
3. Grade crossing safety

For each of these three safety topics, stakeholders established an IAT, a smaller working group comprised of stakeholders with mutual interest and data to inform a particular safety topic. Volpe and CATT Lab, with participation from and consensus of each IAT, were responsible for developing a DMP that described how participants would share data with the RISE data steward.

The Humped Crossing IAT convened to develop a tool to identify and prioritize crossings with elevated profiles for potential actions by State DOTs or for trucking/mapping company routing purposes. CATT Lab drafted a DMP but did not receive any stakeholder's proprietary data; all of the analysis work leveraged government and publicly available data.

CATT Lab developed a Humped Crossing Dashboard in collaboration with the Humped Crossing IAT, which could be used for the following purposes:

1. **Truck Routing:** A trucking/mapping company may use the dashboard/simulation tool to inform the routes of trucks to reduce the risk of a hangup on a high-profile crossing.
2. **Resource to Improve Safety at Humped Crossings:** A working group may use the dashboard to help prioritize crossings for safety enhancements, such as W 10-5 signage. For example, a working group is looking to modernize the current American Association of State Highway and Transportation Officials (AASHTO) standard which currently indicates that over 90 percent of crossings have an elevated profile.

3. Lessons Learned

This research team's assessment of RISE Phase 1 and Phase 2 efforts identified several lessons learned to incorporate into planning for future phases. This section describes each.

3.1 What is RISE?

The RISE website hosted on the FRA webpage defines the vision and goals of RISE. It states:

The Railroad Information Sharing Environment (RISE) is a voluntary, non-regulatory, non-punitive, data-driven safety partnership consisting of railroad stakeholders, including FRA, to advance railroad safety. Through a data trust, railroad stakeholders voluntarily share data and work collaboratively to address complex railroad safety challenges.

The goal of this public-private partnership is to use data for safety improvements that would be difficult for individual railroads to achieve on their own.

Since its inception, the RISE program has successfully advanced the goals and application of a data trust to support rail industry safety. Through the stakeholder interviews, however, the research team learned that some stakeholders do not fully comprehend the specific value proposition and features of RISE, sometimes confusing it with other FRA voluntary safety programs such as Confidential Close Call Reporting System (C³RS), Switching Operations Fatality Analysis (SOFA), and Fatality Analysis of Maintenance-of-way Employees and Signalmen (FAMES).

Contributing to this circumstance was the fact that that industry champions promoting the program during Phase 1 – those that understood the program best – were no longer engaged in Phase 2 and no replacement(s) emerged. These findings point to the need to identify new industry champion(s) and for renewed focus on communicating the program goals, including its standing relative to other FRA safety programs.

3.2 Trust and Data Protections

Railroads and other stakeholders (e.g., State Departments of Transportation) have at times been hesitant to participate and/or share data to support RISE program work. Researchers found this to stem from the following:

- Concerns regarding liability risks² from data sharing
- Concerns about new regulations based on data or information shared through RISE
- Misunderstandings of program specifics as described in [Section 3.1](#)

As a result, stakeholders were reluctant to provide data and, when available, the data provided were inconsistent (e.g., in format, quality, etc.) for analytic objectives.

² Railroad operators specifically cited concerns over risks associated with the Federal Employers' Liability Act (FELA), which enables employees injured at work to pursue monetary damages for injuries sustained due to the negligence (in whole or in part) of a railroad.

3.3 Value of RISE

Lessons from similar data trust programs point to the need to start with a narrowly defined topic that stakeholders can agree merits analysis and is worth sharing sensitive or proprietary data to execute. For example, the first FAA ASIAs-directed study assessed the factors contributing to unexpected terrain awareness warning system alerts at a subset of airports in the United States. These alerts prompted pilots to take corrective actions to prevent controlled flight into terrain when there was no actual imminent threat. Since the conclusion of this first directed study, ASIAs partners authorized the expansion of the analysis to all airports served by ASIAs partners, domestic and international, and to include multiple sources of intelligence [8].

During both RISE Phase 1 and Phase 2, stakeholders were given wide latitude to select safety topics meriting RISE research attention. This scope led to identification and agreement on important, though broadly defined topics – Phase 1 on personal injuries and Phase 2 on grade crossing and trespasser incidents. Without question, these are important safety challenges facing the industry. However, by selecting broadly defined topics, particularly in Phase 2, the required stakeholder groups rapidly grew, including many stakeholders from non-railroad interests, such as highway/road owner/operators (e.g., State Departments of Transportation and municipalities) and enforcement personnel. Further, many stakeholders were disinclined to share data to support the research.

For Phase 2, work successfully advanced relying on publicly available data. While the findings were valuable and important, core RISE stakeholders (i.e., railroad operators and suppliers) were not the focus of convenings and analytic activities.

For the next phase of RISE to realize the potential for collaboration, engagement, and insights from sharing confidential data, the scope assigned to the stakeholders should be bounded to a more narrowly articulated set of conditions that is agreed to by industry participants – and to which participants agree to share data confidentially.

4. Opportunities for Expanded Future Impact

In this research team's experience, several key factors contribute to a successful data trust/data sharing collaborative [2] [7]. This section defines these factors, presents the research team's assessment of RISE against each, and makes recommendations to increase RISE's impact.

4.1 Communicating RISE's Differentiated Value

During interviews, RISE stakeholders shared their support for the RISE program concept and goals. However, it was apparent to the research team that while some stakeholders possess a clear understanding of the requirements and mutual benefits of a data trust program, others confused basic concepts and struggled to differentiate RISE from other FRA-sponsored voluntary safety programs.

Based on these discussions, the project team developed proposed organizational concepts for communicating the relationship between FRA safety programs and RISE. This work also included an organizational chart for the RISE program itself.

Recommendations:

1. Finalize agreement and articulation within FRA of (a) organizational alignment between safety programs and RISE, and (b) specific organizational elements of RISE itself.
2. Capitalize on industry events and meetings to communicate the purpose and goals of RISE, distinguishing the organization and function of RISE from other voluntary safety programs, such as C³RS, SOFA, and FAMES.

4.2 Industry Leadership

The RISE program began with strong industry champions. As noted in [Section 2.1](#), RISE Phase 1 industry champions (i.e., Ken Highlander from Amtrak and Patrick Warren from MTA) were instrumental in facilitating industry convenings and motivating participation. As RISE progressed into Phase 2, these industry champions from Phase 1 had stepped aside and no replacement(s) emerged.

The program needs to identify a new industry champion(s) that sees collaboration in his/her best interest, is willing to invest the time and resources to drive program direction, and can focus program work as well as motivate additional entities to participate.

Recommendations:

1. Identify and secure commitment from a senior leader in the railroad industry to serve as industry champion.
2. Establish and regularly convene the RISE EB to provide strategic direction, prioritize RISE activities, ensure confidentiality of sensitive information, and communicate RISE results to appropriate parties within FRA and industry.
3. Encourage RISE industry stakeholders to share the value they have received from participating in the program.
4. Regularly communicate about RISE, such as at appropriate industry venues (e.g., Rail Share, Big Data in Railroad Maintenance Planning conference, etc.).

4.3 Ensure Commitment to Data Sharing

Confidentiality of participant data is a cornerstone of successful data sharing partnerships. Data owners must be confident that shared data will not be used in any way misaligned with their own interests. Building this trust takes time and should be integrated into all aspects of RISE.

Every industry organization the research team spoke with cited trust as a key factor impeding progress of the RISE program. Specific facets of this challenge that interviewees mentioned include:

- Historic unwillingness of the railroad industry to share data
- Industry less data driven, and instead driven by personnel and seniority
- Misunderstanding of how data would be used in RISE – specifically, that FRA would have the ability to access all data

FRA should articulate how RISE will collect, manage, protect, analyze, and access data to achieve its objectives. Further, FRA should develop RISE communication materials to explain how data sharing differentiates RISE from other voluntary safety programs and how the RISE model will protect shared data from disclosure (e.g., Freedom of Information Act [FOIA] requests) by using an independent data trust operator.

Recommendations:

1. Extend existing and define new assurances, as appropriate, that safety data voluntarily shared by industry will not be used for regulatory or punitive action by the regulator.
2. Develop RISE data management policies and procedures.
3. Develop communication materials to raise awareness of RISE data protections and data management principles.

4.4 Establish a Research Program

By their very nature, data sharing partnerships are focused on complex problems that cannot be solved by an individual stakeholder operating alone. RISE research to date has been decided by individual teams seeking to address perceived priorities, but not linked by a broader vision.

Recommendations:

1. Work with the RISE EB to agree on research program parameters that include:
 - a. A clear description of the research question(s) to study
 - b. A narrowly defined study scope to create one or more near-term successes
 - c. Commitments from stakeholders to contribute data, participate on research teams, and take action on the findings
 - d. A description of what stakeholders will receive in return
2. Agree on one immediate safety research topic aligned with these parameters.
3. Secure EB agreement with the RISE research roadmap, including by outlining a prioritized list of future research opportunities.

5. Conclusion

This work complements and draws on other research undertaken by the team in areas such as stakeholder participation and convening, program documentation, and a recommended program roadmap. The focus of this report was on three phases of research:

- RISE program attributes
- Lessons learned
- Opportunities for expanded future impact

The team concluded that work has progressed across many important dimensions to advance RISE program goals, and today RISE is well positioned to turn toward active program convenings and execution. This will enable RISE to begin realizing the promise of an industry data trust. Findings in the three areas of this report include:

RISE Program Attributes. RISE has completed important research that has demonstrated the potential of shared information. The next logical step for the program is to convene railroad stakeholders to explore the potential of the data trust by defining a research program that leads to the expansion of sharing sensitive or confidential information to build system-level insights.

Lessons Learned. Research and interviews point to the program's next steps, including:

- Clarifying stakeholder understanding of the opportunity and value of a data trust
- Building the documentation and the confidence that data shared in the program will be protected as confidential
- Defining research topics aligned with a vision to deliver stakeholder value and in turn advance program needs

Opportunities for Expanded Impact. RISE is well positioned to advance and realize significant, positive contributions to industry safety. Specific steps to achieve an expanded impact include:

- Communicating RISE's differentiated value, articulating the specific organizational elements of RISE, its alignment with other voluntary FRA safety programs, and its purpose, goals, and impacts to date
- Re-engaging senior leadership, including regular convenings of the RISE EB, to provide strategic direction, prioritize RISE activities, advance research, ensure confidentiality of sensitive information, and communicate RISE results to appropriate parties within FRA and industry
- Addressing lingering uncertainty about data confidentiality protections among industry stakeholders through documented legal assurances, program data management policies and procedures, and active communications with the stakeholders
- Defining targeted research topics with stakeholder consensus and aligned to the strategic vision to achieve successful outcomes quickly, and growing the research program to address the larger, more complex challenges over time

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Abbreviations and Acronyms

ACRONYM	DEFINITION
AASHTO	American Association of State Highway and Transportation Officials
ASIAS	Aviation Safety Information Analysis and Sharing
C3RS	Confidential Close Call Reporting System
CATT Lab	Center for Advanced Transportation Technology Laboratory
DMP	Data Management Plan
DOT	Department of Transportation
EB	Executive Board
FAA	Federal Aviation Administration
FAMES	Fatality Analysis of Maintenance-of-way Employees and Signalmen
FELA	Federal Employers' Liability Act
FOIA	Freedom of Information Act
FRA	Federal Railroad Administration
IAT	Issue Analysis Team
MITRE	The MITRE Corporation
MTA	Metropolitan Transportation Authority
NHTSA	National Highway Traffic Safety Administration
PARTS	Partnership for Analytics Research in Traffic Safety
RISE	Railroad Information Sharing Environment
SOFA	Switching Operations Fatality Analysis
UMD	University of Maryland
US	United States
Volpe	Volpe National Transportation Systems Center