Federal Railroad Administration
Office of Research, Development, and Technology

Broad Agency Announcement – BAA 2024

Appendix C – Research Topics

Note: Concept papers may be submitted at any time, through the closing date of the research topic.

Track Research		
Topic	**Title**	**Closing Date for Concept Papers**
FRA-TR-001	Identifying Potential Derailment Conditions with Wheel/Rail Contact Evaluation	Jan. 16, 2024
FRA-TR-002	Research and Development on Track Lateral Strength	Jan. 16, 2024
FRA-TR-003	Improved Rail Joints	Jan. 16, 2024
FRA-TR-004	Advanced Weld Inspection	Jan. 16, 2024
FRA-TR-005	Improved Weld Technology	Jan. 16, 2024
FRA-TR-006	Concrete Tie Inspection Technology	Jan. 16, 2024
FRA-TR-007	Risk Analysis	Jan. 16, 2024

Rolling Stock and Equipment		
Topic	**Title**	**Closing Date for Concept Papers**
FRA-RS-001	Energy and Emissions	Jan. 16, 2024
FRA-RS-002	Rolling Stock Health Monitoring	Jan. 16, 2024

Rolling Stock and Equipment		
FRA-RS-003	Train Makeup and Handling	Jan. 16, 2024
FRA-RS-004	Improving the Safety of Hazardous Materials Transportation	Jan. 16, 2024

Train Control and Communication		
Topic	**Title**	**Closing Date for Concept Papers**
FRA-TC-001	Foul Volume Hazard Sensing Research	Jan. 16, 2024
FRA-TC-002	Connected Crossing Technology Pilot	Jan. 16, 2024

Human Factors		
Topic	**Title**	**Closing Date for Concept Papers**
FRA-HF-001	Human-Centered AI System Testing and Evaluation	Jan. 16, 2024
FRA-HF-002	A Framework for the Efficient Use of Research Datasets	Jan. 16, 2024

Railroad Systems Issues		
Topic	**Title**	**Closing Date for Concept Papers**
FRA-RSI-001	Addressing Equity Challenges in Evolving Railroad Workforce Training Trends and Best Practices	Jan. 16, 2024
FRA-RSI-002	Influencing Successful Practices in Knowledge Management within the Railroad Industry	Jan. 16, 2024
FRA-RSI-003	Encouraging Early Interest in Railroad Careers	Jan. 16, 2024
FRA-RSI-004	Equity in Rail Workforce Recruitment – Identifying and Training Leadership for Succession Planning	Jan. 16, 2024

Track

Topic: FRA-TR-001

Title: Identifying Potential Derailment Conditions with Wheel/Rail Contact Evaluation

Description

During their yearly testing, FRA's Automated Track Inspection Program (ATIP) vehicles measured track geometry parameters and rail profiles at every foot along the tracks they surveyed. While the vehicles confirmed whether the track met the track geometry requirements of 49 CFR Part 213, there was no analysis of whether the contact between the rail and typical wheel profiles running on a given route constituted a derailment hazard. Identifying locations with poor contact conditions would allow FRA better to assess the overall safety risk on a given route and focus inspection activities.

FRA seeks research into an algorithm that can use the measured rail profiles, curvature, and track gage from an ATIP vehicle and determine the contact conditions for a library of known wheel profiles appropriate to the route. At every foot and for each pair of wheel and rail profiles, the algorithm should calculate:

- The contact angles between the wheel flange and rail
- The location of contact on each rail, solving for multiple points of contact between any wheel and rail pair, if they exist
- Rolling radius difference at each sample (curves only)
- Effective conicity (tangents only)

The algorithm must robustly handle rail profile samples with missing points, extraneous points, or both.

FRA desires an algorithm that can be used for office analyses and in real time on ATIP cars up to 60 mph. FRA would prefer an open-source algorithm based on the CONTACT multi-body simulation module but will consider other model-based solutions. However, neural networks, machine learning approaches, and code or system-specific solutions will not be considered. Offerors must propose a way to validate the algorithm's accuracy in their submission.

Topic: FRA-TR-002

Title: Research and Development on Track Lateral Strength

Description

Track buckles can cause severe accidents. Buckles can occur when the track lacks sufficient lateral resistance and the rails have high compressive loads. Spot-checking the track for adequate lateral resistance only goes so far when there are 140,000 miles of railroad track in the U.S.

This topic is open to research and development work which would advance any of the following goals:

1. Develop and prove technologies or methods to increase the lateral track strength cheaply and practically.
2. Develop a technology to provide a proxy measurement of track lateral strength from an in-motion system.
3. Better characterize ballast consolidation, track lateral strength, and RNT profile maturation in new or freshly tamped tracks as a function of millions of gross tons of traffic.
4. Develop a new technique or design to improve the current single-tie push test device to measure the applied lateral force and resulting lateral displacements of the tie.

Offerors shall demonstrate knowledge and comprehension of the scientific and other technical challenges. Offerors shall explain how their proposed research differs from prior work and how it advances the state-of-the-art. Preferences shall be given to research projects and technologies with a higher Technology Readiness Level and ready for field or application testing. Projects should be focused on obtaining significant, measurable results.

Topic: FRA-TR-003

Title: Improved Rail Joints

Description

Although they have been widely used for years, rail joints represent a significant weak spot in the track structure. FRA seeks innovative research to improve rail joints and reduce derailments caused by failed joint bars. Projects may focus on identifying or improving poor support conditions, improvements to the joint bar design, or take an out-of-the-box approach to joint design. Proposed projects should identify why the concept is an improvement over current designs and discuss the ability for field deployment. FRA will not consider projects that involve expansion joints or eliminate the joints by welding.

Topic: FRA-TR-004

Title: Advanced Weld Inspection

Description

Broken welds are one of the leading reasons for train derailments and cause more than twice as many derailments than any other track-related factor. Current rail inspection technologies are not designed to navigate the complicated geometry of in-track welds.

This topic seeks research projects for new weld inspection technologies that can lower the risk of this potential weak spot in track. Ideally, such an advanced weld inspection system will be non-contact and have the potential to be used on revenue service equipment, including locomotives.

Offerors must propose a way to validate the false negative (i.e., not finding a defect that is present) rate of the technology in their submission.

Topic: FRA-TR-005

Title: Improved Weld Technology

Description

Two welding processes, thermite welding and electric flash-butt (EFB) welding, account for almost all in-track welds in the rail industry. Thermite welding has been the predominant welding process for joining rails in the field due to its portability and minimal installation time. However, the ductility and fatigue properties of the thermite weld material are much lower than the base rail. EFB welding provides a faster method; however, it is less portable and requires more time and longitudinal movement of the rail ends, which is not always efficient.

This topic seeks research projects for improved technologies to increase these welds' reliability and fatigue life. Offerors must have extensive experience in the proposed research area. Concept papers must explain how the Offeror will surmount the scientific and other technical challenges encountered in past research efforts in this area.

Due to funding limitations, the welding technology must be at least at TRL 4 and not require significant investment for further hardware development. Offerors requiring significant investment for hardware development should consider applying to Track 4 (Research, Safety Programs, and Institutes) of FRA's Consolidated Rail Infrastructure and Safety Improvements (CRISI) grant program. For further details, visit the FRA CRISI grants website.

Topic: FRA-TR-006

Title: Concrete Tie Inspection Technology

Description

The U.S. railroad system contains approximately 140,000 miles of track. About 10 percent of all U.S. railroad ties are made from concrete and are used in heavy freight and passenger service tracks. These ties are typically found on higher-speed passenger routes and in high-tonnage lines in the freight rail industry. Many of these crossties have been in service for decades. Quantifying the condition state of these essential track components is critical to efficiently maintaining track safety. Concrete ties can fail in many ways, including brittle fractures from overloading, a loss of pre-stressing force due to fatigue or cracks, rail seat deterioration from service, and loss of section due to abrasion from ballast. This topic seeks novel technology research and development to efficiently and effectively inspect concrete crossties installed in track.

This topic aims to source applied research projects to investigate non-contact, non-destructive technologies to assess the internal and external condition of concrete railroad crossties in track. FRA is particularly interested in investigating step-frequency GPR or similar technologies for this application. This research supports DOT goals for improving the state of good repair, safety, and efficiency. When developed and tested, such technologies will allow for the quantitative assessment of the condition of these critical track components, ensuring the safety of rail infrastructure and preventing the premature replacement of components.

Proposed solutions shall provide quantitative inspection data to allow for informed decisions regarding tie conditions. Inspection of external tie features, including the identification of surface cracks located in the rail seat area, in the center of the tie, and at the tie ends; rail seat abrasion; the identification of exposed reinforcements; the presence and orientation of the rail seat pad; the presence and orientation of rail insulators, rail clips, and fasteners; tie section depth (detection of tie wear from abrasion); and the inspection of internal tie condition, including assessing the amount and location of internal cracking or voids and identifying other defects related to the bond condition between reinforcements and the concrete.

A fully developed solution will report external and internal crosstie feature conditions in an automated manner. FRA will consider partial solutions provided the Offeror presents an approach to obtaining a more complete inspection. FRA envisions the inspection system(s) will be suitable for deployment on track hi-rail vehicles operating up to 30 mph.

The FRA e-Library system contains many Technical Reports documenting research into concrete crosstie design, manufacturing, testing, and failure modes.

A few of these reports are linked here for reference:

International Concrete Crosstie and Fastening System Survey | FRA (dot.gov)

Improved Concrete Crosstie and Fastening Systems for US High Speed Passenger Rail and Joint Corridors: Volume 1 – Project Summary Report | FRA (dot.gov)

Understanding the Splitting and Bursting Failure of Concrete Crossties | FRA (dot.gov)

A Study of Environmental and Track Factors that Contribute to Abrasion Damage of Concrete Ties | FRA (dot.gov)

Inspection of Concrete Ties Using Sonic/Ultrasonic Impact Velocity and Impact Echo Measurements | FRA (dot.gov)

Topic: FRA-TR-007

Title: Risk Analysis

Description

FRA seeks research into frameworks that can improve how safety risk is assessed. Offerors may submit for one subtopic (please specify) or all three. If submitting for more than one, Offerors should provide separate submissions for each subtopic.

Subtopic 1: Bayesian Analysis of Potential Risk for Track-Caused Derailments – University Only

North American railroads increasingly use more sophisticated instrumentation to inspect various elements comprising the track structure, often with unmanned equipment. As a result, some railroads have sought regulatory relief to reduce the number or frequency of manual inspections of the track infrastructure. However, no existing framework exists to evaluate how overall safety risk changes when combining new technologies with different manual inspection regimes.

This subtopic seeks projects to develop a Bayesian-based risk evaluation framework capable of quantifying the potential reduction in risk of a track-caused derailment and the associated safety improvements due to these developments. Specific areas the framework must address include:

- Quantify the potential for a train derailment at a specific track geometry defect.
- Quantify how the potential for a track-caused derailment changes for non-measurable conditions compared to measurable geometry issues.
- Quantify how the frequency and distribution of instrumented and manual track inspections affect the risk of a track-caused derailment.

The framework must be able to quantify the safety risk of existing manual inspection processes, so special consideration must be given to the effects of human factors on manual inspection processes, both on its own as well as when combined with autonomous operations.

Because the framework may be used in regulatory decisions, black-box models based on artificial intelligence or machine learning are not acceptable solutions. Instead, preference will be given to probability-based approaches incorporating Bayesian inference. The framework must use publicly available data and may not rely on information or training data provided by any one railroad or group of railroads.

Subtopic 2: Non-Destructive Inspection Intervals for Rail Defects

FRA wants to understand whether non-destructive test intervals for rail defects can be targeted at a local line level to improve safety. Current guidelines for the frequency of non-destructive tests for rail defects usually prescribe test intervals that do not exceed a given calendar or tonnage interval. Those intervals typically only consider track class and the presence of passenger or hazardous material traffic. However, those guidelines usually do not consider "local conditions" on a given route, such as daily temperature changes, the extent of rail wear, wheel impact loads, residual stresses, etc. These local conditions play an important role in the growth of a transverse defect (TD) and the critical crack size needed to cause a service failure.

This subtopic seeks projects to develop a framework that can assess the risk of a rail failure due to a TD for a given line and its corresponding local conditions. The framework should not attempt to predict the likelihood of a defect occurring or simulate the initiation of a defect. Instead, the framework should assume TDs of various sizes were missed at the most recent inspection and predict the risk that those TDs would grow to the critical crack size before the next scheduled inspection.

Because the framework may inform future regulatory decisions, black-box models based on artificial intelligence or machine learning are not acceptable solutions. FRA expects the framework to incorporate previous research it has sponsored on TD growth based on fracture mechanics.

Subtopic 3: Derailment Rates

FRA has been using million train miles (MTM) as the normalizing factor in calculating train derailment rates for some time. FRA would like to know whether MTM adequately reflects the

effects of industry operational, policy, and technological changes on derailment rates. This topic seeks projects to research whether MTM sufficiently captures the effects of these changes and investigate alternative approaches to normalizing derailment data if MTM is found wanting. FRA is particularly interested to learn whether normalizing the number of derailments by the number of opportunities for a derailment to occur (i.e., a Six Sigma DPMO approach) would better reflect how changes in industry operating practices and technology developments affect derailment rates.

Rolling Stock

Topic: FRA-RS-001

Title: Energy and Emissions

Description

FRA is aware of potential benefits from the increased use of clean energy technologies (hydrogen, battery-energy storage systems [BESS], alternative fuels, etc.), but must ensure they are safe when used to power rail vehicles. The rail operating environment is extremely harsh, and equipment operated in this space must be structurally resilient, maintained in a state of good repair, operationally immune, and safe. FRA-sponsored research will investigate the crashworthiness, safe operation protocols, fire safety, workforce development, and emissions reduction capabilities of new and advanced technologies for the decarbonization of rail vehicles. In addition, FRA will evaluate the benefits of the new decarbonization technologies in promoting environmental justice. FRA invites proposals on the following topics:

- Structural crashworthiness of fuel storage systems and appurtenances in the BESS and hydrogen-fueled rail propulsion, and other alternative fuel technologies used to power rail vehicles.
- Support the development and demonstration of advanced higher-energy-density batteries, etc. for powering line-haul locomotives.
- Investigation of the potential effects of electromagnetic interference from high-power battery recharging of electric trains and how it may adversely affect safe operations of trains other nearby rail equipment and wayside signal systems.
- Evaluating the performance of BESS, hydrogen fuel cell, and other non-traditional railroad propulsion technologies under railroad environment shock and vibration loading and environmental conditions
- Investigating the efficiency and emissions of biofuel in rail applications
- Conduct an ergonomic and behavioral study of the impact of new technologies (BESS, hydrogen, etc.) on workforce employed in the rail space – specifically, how railroad employee duties will change with the introduction of these new technologies
- Investigate and demonstrate technology to reduce emissions associated with railroad track maintenance equipment.
- Investigate the effects of railcar air leakage and its impact on the operations and

performance of automatic engine start/stop systems to reduce idling and improve rail vehicle emissions.

Topic: FRA-RS-002

Title: Rolling Stock Health Monitoring

Description

This topic seeks innovative research and development for improving the efficacy of rolling stock component condition monitoring and trending. FRA will consider both novel concepts for wayside and on-board detection, with emphasis for on-board solutions. Topics of interest include.

1. Identify effective wayside or on-board technologies for instantaneous and trending condition monitoring of wheel journal bearings for hot or failing bearings. Propose optimal condition monitoring and alert thresholds and distances between detectors for rolling stock asset maintenance and immediate safety actions.
2. Identify effective wayside or on-board technologies for instantaneous and trending condition monitoring of wheel defects and wheel profiles for wheel flats, hollow worn wheels, thin flanges, high flanges, two-point contact, etc. Determine optimal condition monitoring and alert thresholds and distances between detection or detectors for maintenance and immediate safety concerns.
3. Identify effective on-board technologies for instantaneous and trending condition monitoring of railroad trucks for poor curve steering, axle angle of attack, lateral instability (hunting), or other deterioration. The on-board technologies should replicate or improve on the function(s) of current Truck Performance Detectors (TPD). Propose optimal condition monitoring and alert thresholds and sampling time between detection for maintenance and immediate safety concerns.
4. Identify effective on-board technologies for monitoring and alerting of freight car handling and component issues, for example (list not exhaustive), unreleased hand brakes, piston travel indication, and over-speed impacts, etc.

Topic: FRA-RS-003

Title: Train Makeup and Handling

Description

This topic seeks innovative research and development for improving train makeup strategies and evaluation. Examine train existing consist creation, management strategies and guidance. Leverage simulation tools such as the Train Energy and Dynamics Simulator (TEDS) or Train Operations and Energy Simulator (TOES) tools for analysis of train makeup, operations to address utilization of distributed power, fuel efficiency, management of in-train forces for manifest trains, and management of consists incorporating cushioning units.

Topic: FRA-RS-004

Title: Improving the Safety of Hazardous Materials Transportation

Description

Develop, analyze, and test means for improving the structural integrity of tank cars. Examine methods for protecting hazardous material tank cars and service equipment from heat, and the capability of these tanks to survive post- derailment fire conditions. Examine thermal protection levels for the safe transportation of energy products (e.g., LNG, crude oil, ethanol).

Train Control and Communication

Topic: FRA-TC-001

Title: Foul Volume Hazard Sensing Research

Description

Advanced train control systems, in many envisioned forms, may require or benefit from locomotive onboard hazard sensing capabilities. These systems hold the potential to aide locomotive engineer situational awareness and improve public and rail personnel safety by detecting hazards present on the tracks. These may include people, equipment, road vehicles, landslides, downed trees, ballast failures, track buckles, etc. FRA invites concept papers which test or evaluate the capabilities and performance of onboard sensing technologies to include Lidar, radar, visual, infrared, or other sensors. This includes development of computing platforms and algorithms to enable highly reliable classification and identification of hazards. Experience in the application and transferability of these sensing technologies in other transportation systems (aviation, maritime, highway, etc.) is highly desirable. Railroad support and/or partnership is encouraged.

Topic: FRA-TC-002

Title: Connected Crossing Technology Pilot

Description

FRA has been a leader in research and development of connected vehicles technologies for enhancement of safety and mobility at rail grade crossings for nearly 10 years. These include the Rail Crossing Violation Warning (RCVW) V2I reference application, Intelligent Vehicle Routing and Driving Strategies for Connected Crossings, a Cloud-based Communication Platform for Connected Crossings, and C-V2X communication performance analysis for passive rail crossings. This work has focused on proof-of-concept demonstration, requirements development, and performance testing.

Now, FRA seeks to execute a larger-scale and longer-term pilot deployment of connected crossing technology. Objectives are to demonstrate fleet-scale safety and/or mobility benefits, evaluate long term performance and reliability, and engage rail and highway stakeholders.

Concepts should seek to include technology supplier, railroad, and local government partnerships. Potential applications may include, but are not limited to, RCVW-type CV

application deployment, freight vehicle routing, first responder routing, blocked crossing mitigation, etc.

Human Factors

See Rolling Stock and Train Control sections for other Human Factors-related topics.

Topic: FRA-HF-001

Title: Human-Centered AI System Testing and Evaluation

Description

Produce Testing and Evaluation (T&E) methodologies for railroad operational systems that use artificial intelligence (AI). Use FRA's Cab Technology Integration Laboratory (CTIL) to develop a set of common use cases for human-centered AI for locomotive and train control. Must include human-centered or assured control authority in the concept. The use cases should address safety of operation scenarios and include a railroad partner.

Topic: FRA-HF-002

Title: A Framework for the Efficient Use of Research Datasets

Description

Grants and contracts from Federal agencies produce data. Grants provided in different contexts could result datasets that are similar or even overlap. For example, FRA and FTA funded research may result in datasets related to trespassing. Additionally, different entities may be testing new technologies to solve a similar problem, and each of these technologies produces a dataset related to the problem. For example, stakeholders may assess grade crossing elevation profiles using LiDAR-based approaches or computer vision techniques in conjunction with open-source data. Further, datasets may be generated over different time spans resulting in difference in not only the quality of the data collected ((e.g., accuracy, resolution) but process specific differences as well (e.g., data-use agreements, privacy requirements, policies etc.).

FRA seeks a framework to enable learning from related but disparate datasets generated from multiple federally funded grants and programs. Learning from such larger datasets may not only lead to improved systemic insights but also enhance solutions that leverage machine learning techniques by providing larger training data sets.

Offerors shall demonstrate knowledge and comprehension of the policy, process, people, and technical challenges encountered in similar past efforts and how those are planned to be addressed.

The concept paper should describe the elements needed to be put in place when the grant or contract is funded as well as when data is collected, analyzed, stored. The concept paper should describe how the data can be made available to relevant stakeholders. In addition, the concept paper should include elements needed to be put in place when the data is generated to facilitate combination with a yet-to-be-collected dataset in future.

The concept paper should incorporate a proof-of-concept test on area of interest to FRA (e.g., grade crossing safety, trespass prevention). Subsequent project phases may focus on how to generalize and implement the framework as part of comprehensive system through which grant and research datasets, in domains of interest to DOT, are managed and shared.

Railroad Systems Issues

Topic: FRA-RSI-001

Title: Addressing Equity Challenges in Evolving Railroad Workforce Training Trends and Best Practices

Description

Training the current and future rail workforce is rapidly evolving, partially resulting from the COVID-19 pandemic. Technologies and approaches to facilitate learning at all levels have been increasing. This evolution of training and educational delivery will dramatically affect learning methods and delivery and pose a challenge to ensure trainees or students are given equitable opportunities to develop their skills. This comprehensive approach should place an emphasis on diversity, exploring training equity issues and opportunities in minority-serving institutions (MSIs), technical/vocational/trade schools, community colleges, and other underrepresented groups and locations. The objectives of this research are to:

- Identify the most effective methods for railroad training across the trainee/student spectrum.
- Identify learning barriers posed by new training practices (access, equity, diversity, inclusion).
- Identify training equity criteria and measures of successful implementation.
- Identify inequities in certifying training and work experience and the transportability of credentials across the industry.
- Find methods to provide academic institutions the ability to identify and rapidly adapt and respond to emerging workforce development requirements.
- Identify training institutions that have rail education programs and promote the reskilling/upskilling needed for trade and craft positions in the industry's workforce.
- Explore opportunities to build effective partnerships and networks with MSIs, which include historically Black colleges and universities, to connect the needs of MSIs in achieving training equity.

Topic: FRA-RSI-002

Title: Influencing Successful Practices in Knowledge Management within the Railroad Industry

Description

This topic seeks to understand and identify standards and successful practices in knowledge management (KM) in the railroad industry. The industry has consistently identified KM as a

major workforce issue as referenced in FRA research reports. As retirements and workforce shrinkages continue to degrade in-house knowledge, railroad leaders need to consider aggressive planning of a robust knowledge management strategy that captures their organization's intellectual capital. Traditional methods of building successful career paths into and within the railroad industry need to be rethought and re-designed to accommodate new, diverse, and prepared/teachable talent (inclusive of those with or without previous railroad experience). The objectives of this research include:

- Provide a foundation and/or framework that considers people, process, technology, and information/data.
- Identify appropriate measures of outcomes and impact, and other rail-specific factors necessary to transfer critical knowledge.
- Determine how KM should be integrated into other aspects of employee growth and development – including training, onboarding and developmental experiences, and other phases of the employee life cycle.
- Consider practices from other industries and their applicability, feasibility, and scalability regarding railroads.

Topic: FRA-RSI-003 – University Only

Title: Encouraging Early Interest in Railroad Careers

Description

Getting started in a career in railroading currently requires no college nor a trade school education. Further, an aging workforce, increased retirement of rail workers, and technological advancements have created a situation ripe for the development of new talent to account for potential changes in the railroad industry. There are few early educational programs that introduce and prepare children and adolescents for careers in railroading. The closest academic analog to the occupational requirements of careers within the railroad industry lie within educational programs grounded in science, technology, engineering, and math (STEM). Therefore, it is possible to leverage the current STEM fervor, which has resulted in the creation of magnet schools throughout the country, to introduce young people to railroading as a career.

A DOT priority is to ensure equity and economic opportunity/recovery in jobs. FRA seeks to support DOT's priority by introducing young people to railroading and fostering diversity to ensure equitable access to these careers. This topic seeks to: (1) identify novel approaches to increasing early (K–12) awareness and interest in railroad career; (2) implement creative strategies to cast a wider net to identify talent early, especially in underrepresented groups; and (3) establish a pipeline that will allow training and development at the post-secondary level.

This initiative could include the following:

- Mentoring opportunities between minority serving institutions and other academic institutions with railroad-specific programs/majors

- Programs that partner K-12 academic institutions with railroads to increase awareness of railroad careers.
- Apprenticeships, internships, or co-op opportunities that will allow students at the K–12, collegiate, or vocation levels to get hands-on experience in daily operations and develop safety awareness.
- STEM conferences and/or competitions that challenge young minds to identify and solve rail-related problems.
- Curriculum development that integrates railroad science, technology, and engineering into STEM programs.
- Establish a railroad adoption program that allows railroads to adopt local schools.

Topic: FRA-RSI-004 – University Only

Title: Equity in Rail Workforce Recruitment – Identifying and Training Leadership for Succession Planning

Description

Diversity within the rail industry workforce has been a pervasive issue for decades. Our workforce development research continues to identify diversity as an industry-wide challenge. This issue presents itself in all position levels, including all leadership ranks. The lack of diversity among leaders across the railroad industry suggests that succession planning is failing to identify and attract diverse talent for consideration. Failure to attract adequate numbers of women and minorities means the candidate pool of internal talent available to assume leadership positions remains insufficient, fueling a self-fulfilling prophecy of non-diverse selections for leadership positions. Succession planning enables the early formation of candidate slates from which leadership selections occur. A look at current succession plans accurately forecasts the makeup of the next wave of leadership. Thus, the objectives of this research include:

- Researching and identifying innovative ways to augment existing succession plans with suitably skilled, diverse talent from across the rail industry and tangential industries.
- Conducting studies and determining the underlying issues affecting broad workforce equity issues and propose solutions to improve diversity across all rail occupations (as a way of increasing potential internal candidates for promotional opportunities).
- Partnering with rail unions to increase awareness and focus on equity for all rail workers and exploring innovative seniority considerations to expedite movement among diverse candidates.
- Identifying and developing leadership training on nurturing diverse talent and ensuring the workplace welcomes them. Identify tangential best practices and policies from other agencies, organizations, and global entities.
- Benchmark tangential best practices and policies from other agencies, organizations, and global entities.