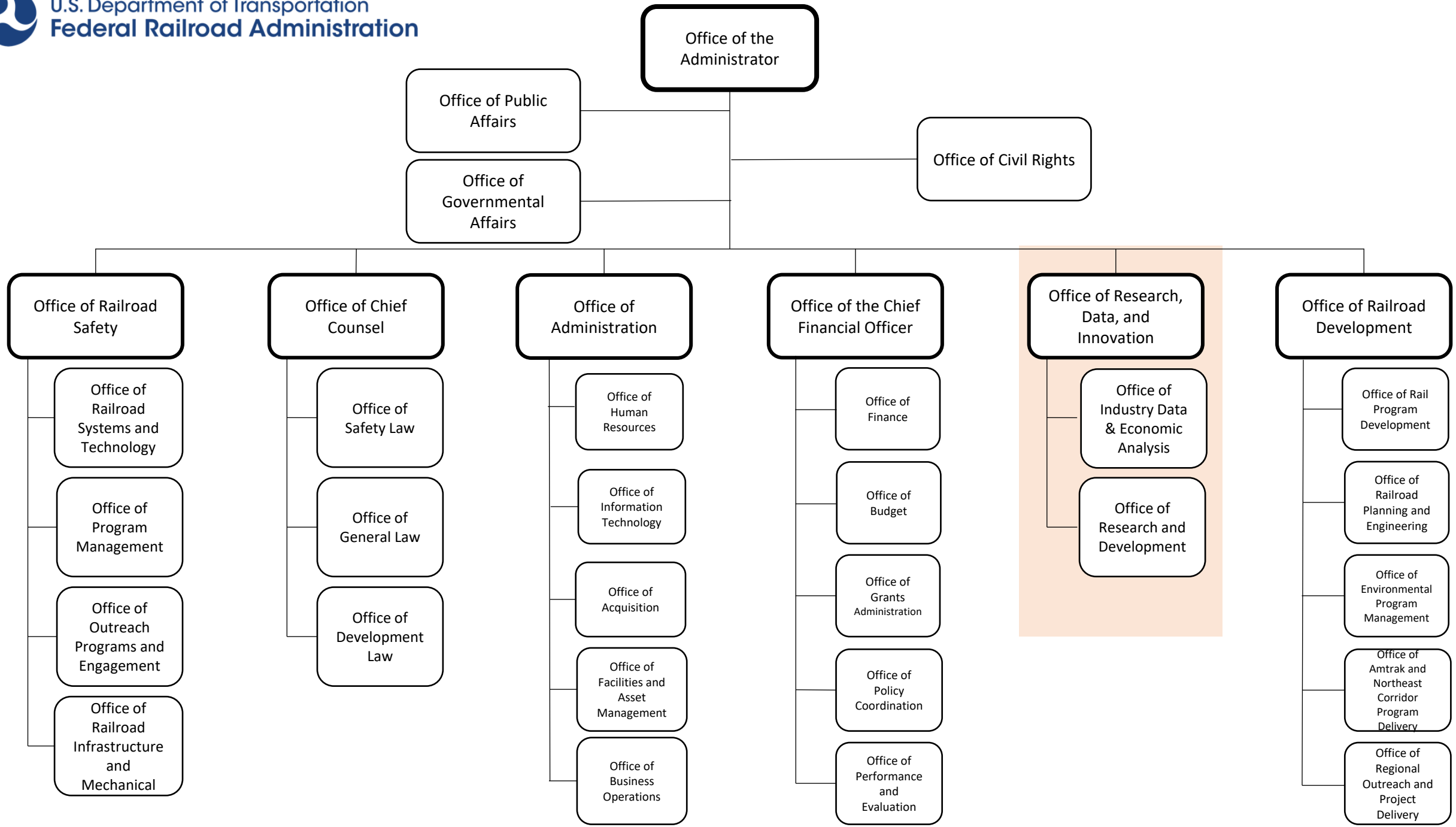
RAIL

MOVING AMERICA FORWARD

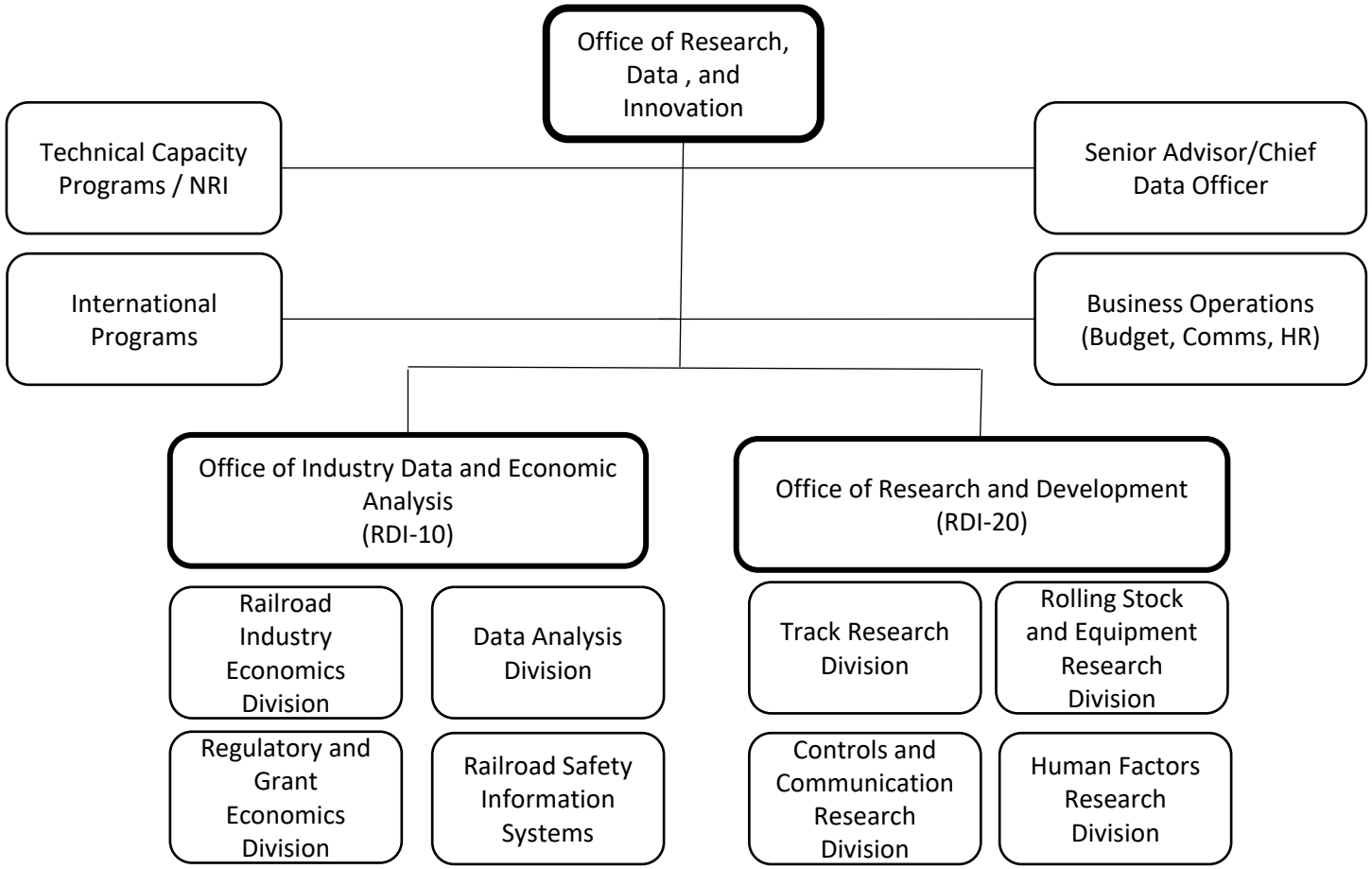
Office of Research, Data and Innovation

Leverage research and data to accelerate innovation in railroad safety and development.

U.S. Department of Transportation
Federal Railroad Administration



Office of Research, Data, and Innovation (RDI)



Data Guiding Principles

Service Oriented Mindset

- ✓ Help you leverage data to meet your objectives
- ✓ Data Consultation

Data Democratization

- ✓ Enable non-technical user to access relevant data without having a gatekeeper or needing outside help
- ✓ Help free your data from silos – discoverable and cross-walking

Innovative

- ✓ Promote organization wide skills with exploring and communicating with data
- ✓ Prototype advanced analytics in an agile manner to show value and spur innovation (including in business process)

Chief Data Officer
Neeraj Koul

- **Solve Mission Problems with Data**
- **Promote Data sharing**
- **Build a Data Driven Culture**
- **Drive Transformation through a Data Strategy focused on meeting stakeholder needs**

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Office of Industry Data & Economic Analysis (RDI-10)

Kebo Chen, Acting Office Director, RDI -10

Integrating and Collaborating across FRA

RDI-10 provides FRA Program offices/DOT data services and economics analysis.

Railroad Industry Economics Division

- Supply chain and railroad employment analysis (STB)
- FLOW program/Rail Supply side ideas and metrics w OST
- Port Development programs with MARAD

Data Analytics and GIS Division

- GIS mapping of rail yard, Justice 40 communities, and pollution levels to support development public tools for future CRISI grant applications
- Risk Models, TOPS, complaint analysis to improve Safety
- POV dashboard to support Inspection

Regulatory and Grants Economics Analysis

- Coordination with RRS and RCC and Support rulemakings
- Grant BCA reviews

Railroad Safety Information Systems

- Leading the Part 225 Working Groups to propose rule changes to 49 CFR Part 225
- Managing RSIS and responding to RRS inspector requirements or issues
- Leading the effort to redesign the Safety Data Public Site, along with RRS and ROA

RAIL

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Office of Research, Development, and Technology

Maryam Allahyar, Ph.D.
Director

RD&T Research Divisions

Since 2006, FRA has invested approximately $35–40 million annually in research and development.

TRACK RESEARCH DIVISION

- **FOCUS:** To develop technologies to improve track inspection and monitoring.
- Track and infrastructure failure is the leading cause of train derailments in the United States.
- Another common cause of derailment is incorrect interaction between moving vehicles and the track.

ROLLING STOCK RESEARCH DIVISION

- **FOCUS:** To prevent derailments, equipment failure, and undesired emergency brake applications.
- Other integral research areas are risk assessment, risk mitigation, and safety assurance.

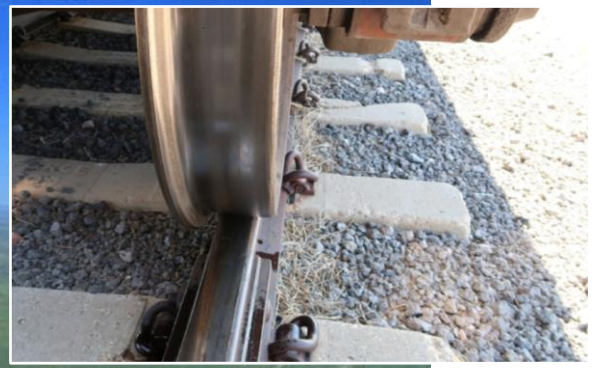
TRAIN CONTROL & COMMUNICATIONS RESEARCH DIVISION

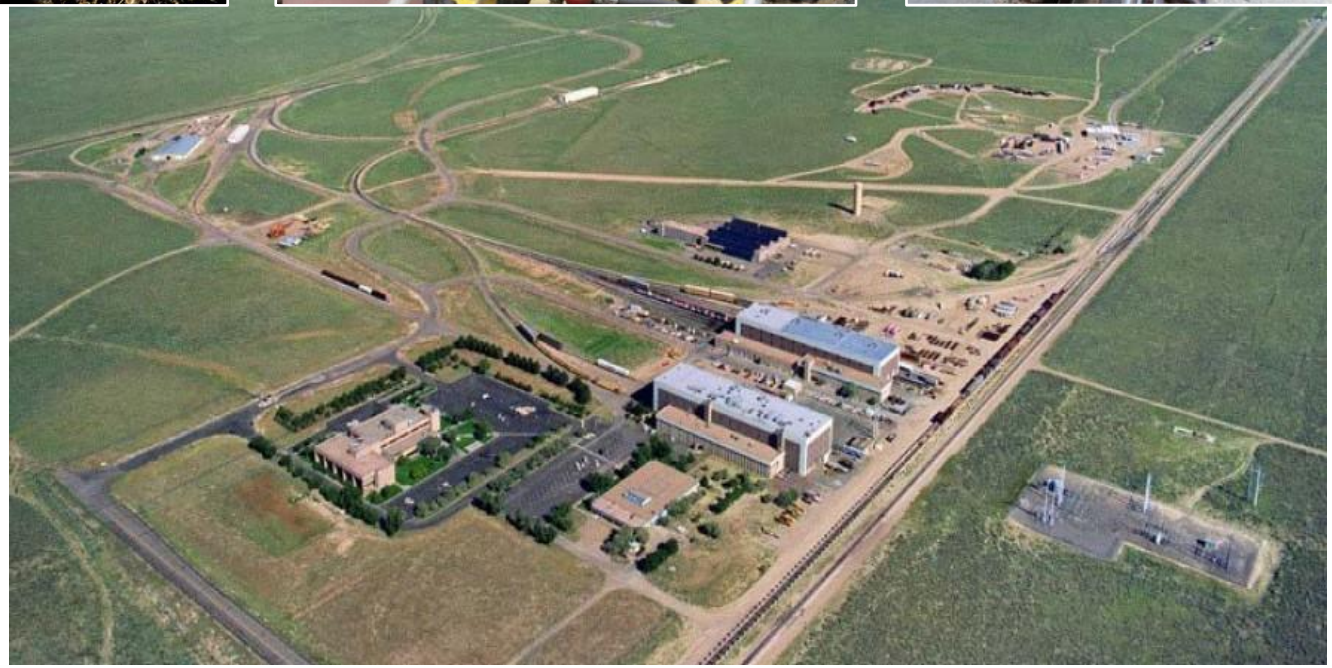
- **FOCUS:** To develop intelligent railroad systems.
- Systems incorporate new sensor, computer, & digital communications technologies into train control, braking systems, grade crossings, and defect detection; intelligent communication systems integrate with planning and scheduling systems.

HUMAN FACTORS RESEARCH DIVISION

- **FOCUS:** To conduct research into automation, fatigue, distraction, and ergonomics.
- FRA conducts pilot trials to improve safety and organizational culture in railroad organizations.
- Human errors account for more than one third of all train accidents in the U.S. railroad industry.

Transportation Technology Center





The FRA Transportation Technology Center in Pueblo, Colorado, plays an important part in the research, development, and testing of rail infrastructure and equipment.

Very Long Trains – Research and Studies

- **Stakeholder Perceptions of Longer Trains (Report released December 2022)**
- **Review of Very Long Train Operations (Brake Study)**
- **National Academies of Science**
  - **Bipartisan Infrastructure Law required a study on the Impact of Trains Longer than 7500 Feet**

Very Long Trains – Research and Studies

Stakeholder Perceptions of Longer Trains (Report released December 2022)

Report documents stakeholder perceptions emerging from focus groups about very long trains (VLTs) with participants from three labor unions, the Federal Railroad Administration (FRA), and two freight railroads.

Stakeholders expressed uncertainty about how to define a VLT and noted that the safety of longer trains is related to additional contextual factors beyond train length.

Diverse set of factors identified as affecting safety do not fit easily into a framework for understanding the relationship between train length and safety.

Two high-level themes emerged from the focus groups:
- Train lengths increased before infrastructure, technology, equipment, and operating practices could accommodate them.
- Resource reductions increased operational intensity.

Very Long Trains – Research and Studies

Review of Very Long Train Operations (Brake Study) – scheduled completion fall 2023

Review and understand train performance and accepted practices for VLT (200+ cars) operations. This effort focuses on confirming the safe performance of the air brake system as well as resulting train dynamics for VLTs through a series of tests and simulations.

A collaborative effort with industry stakeholders, including the Association of American Railroads (AAR) representing the railroads, air brake system vendors, and labor unions. A Test Review Committee (TRC), with representation from the various parties, guides the technical effort.

Potential Impact

- Improved and demonstrated operational safety through better understanding of brake system performance
- Potential to document safety benefits of using technologies, such as distributed power.
- Validate simulations tools under these newer operating regimes, allowing better customization of operating protocols.

Very Long Trains – Research and Studies

National Academies
Bipartisan Infrastructure Law required a study on the Impact of Trains Longer than 7500 Feet

An ad hoc study committee of experts. Period of performance is from Sep 2022 to June 2024

The committee will examine factors associated with the operation of these trains, including train dynamics and handling, braking, distributive power, communications and training.

The scope of task will also include impacts on labor and crew requirements, highway rail grade crossings, passenger rail operations and air quality.

Four meetings have been held with presentations from FRA, SMART, ATDA, BLET, AAR, NS, AMTRAK, Metra, NTSB, UP, CSX

Additional meetings planned (~1 per month) including technical presentations for in-depth discussions on specific topics (e.g., wayside detectors, distributed power and in-train forces, radio communications).