BUDGET ESTIMATES

FISCAL YEAR 2023

FEDERAL RAILROAD ADMINISTRATION

SUBMITTED FOR THE USE OF
THE COMMITTEES ON APPROPRIATIONS

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FY 2023 PRESIDENT'S BUDGET JUSTIFICATION

TABLE OF CONTENTS

Page

Section 1: Overview

Administrator's Overview 1

Organization Charts 5

Section 2: Budget Summary Tables

Budget Authority 9

Total Budgetary Resources by Appropriation Account 11

Budget Request by DOT Strategic and Organizational Goals 13

Outlays 14

Summary of Requested Funding Changes from Base 16

Working Capital Fund 31

Full-Time Equivalents (FTE) 32

Full-Time Permanent Positions (FTP) 33

10-Year Funding History Table 34

Section 3: Budget Request by Appropriation

Safety and Operations 35

Railroad Research and Development 55

Amtrak 103

Consolidated Rail Infrastructure and Safety Improvements 119

Federal-State Partnership for Intercity Passenger Rail Grants 131

Restoration and Enhancement Grants 143

Railroad Crossing Elimination Program 149

Administrative Provisions 157

Section 4: Research, Development, and Technology 159

Section 5: Information Technology Expenditure 167

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

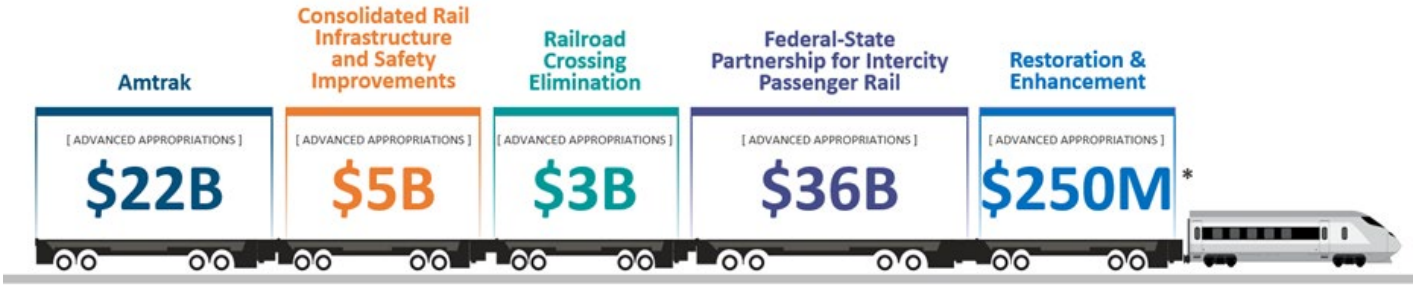
ADMINISTRATOR'S OVERVIEW

The Federal Railroad Administration's (FRA) mission is to enable the safe, reliable, and efficient movement of people and goods for a strong America, now and in the future. FRA oversees the safety of the U.S. railroad industry by carrying out a robust regulatory enforcement and technical assistance program that combines rigorous data analysis, continuous stakeholder engagement, and the expertise of a highly-skilled and dedicated workforce. FRA also administers a broad portfolio of grants aimed at improving safety and the condition of the Nation's rail infrastructure, while enhancing the operating performance of both intercity passenger and freight rail service. These investments enable the introduction of new and upgraded intercity passenger rail corridors that help to connect communities, combat climate change, and grow America's economy and job opportunities. FRA's railroad safety and investment programs are supported by cutting edge research and development, through which FRA advances technology innovations and new practices to improve rail safety and efficiency.

The FY 2023 President's Budget requests $4.66 billion for FRA, including $3 billion for Amtrak grants, $1.35 billion for discretionary rail grants, $254.43 million for the Safety and Operations account, and $58 million for the Research and Development account. FRA's programs and the funding requested in the FY 2023 President's Budget present an integrated and complimentary approach that ensures the safety and performance of the rail industry today, while supporting the growth and innovation required to deliver the rail network of the future.

The passage of the Infrastructure Investment and Jobs Act (IIJA) marked a watershed moment that will help define the future of rail transportation in the United States. IIJA included $66 billion in supplemental advance appropriations and a five-year reauthorization of surface transportation programs for FY 2022 – FY 2026.

FRA IIJA Supplemental Advance Appropriations Grant Funding

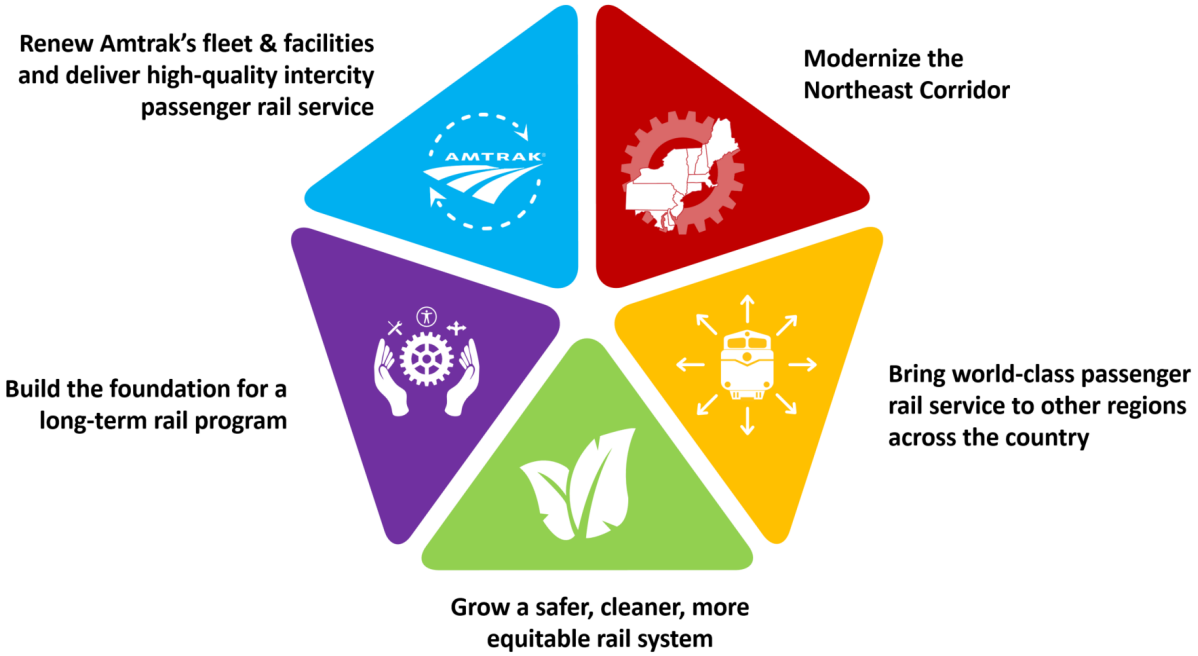


**The $250 million for Restoration & Enhancement Grants is a takedown from Amtrak National Network funding.*

This generational investment and commitment from Congress and the Biden-Harris Administration will enable intercity passenger rail to play a much larger—and necessary—role in supporting our mobility needs, ensure the vitality of the freight rail network, and address critical

railroad safety concerns. The advance appropriations structure of the $66 billion IIJA supplemental will also demonstrate the project development and delivery benefits and efficiencies that can be achieved by project sponsors with greater funding certainty, predictability, and commitment. The funding and policies proposed in the FY 2023 President's Budget will support and further FRA's five key IIJA investment goals:

FRA Key IIJA Investment Goals



The FY 2023 President's Budget also represents the next step in the Biden-Harris Administration's efforts to build back better and restore our nation's infrastructure in an environmentally and socially conscious manner that benefits all Americans. The FY 2023 President's Budget closely aligns with the Biden-Harris Administration's transportation priorities, including:

- **Safety**: An unwavering commitment to railroad safety underpins all of FRA's operations and proposed actions. The FY 2023 President's Budget promotes a comprehensive approach to addressing the three leading causes of fatalities in the rail industry – grade crossings, trespassing, and suicide. IIJA strengthened the Consolidated Rail Infrastructure and Safety Improvements (CRISI) grant program by clarifying the eligibility of trespass prevention projects. Increased resources for trespass prevention capital projects, enforcement of state and local trespass and grade crossing laws, and suicide prevention efforts through CRISI will close a significant gap in the Federal Government's ability to assist the railroad industry in confronting these issues. IIJA also established a new program dedicated to improving highway-rail grade crossing safety, the Railroad Crossing Elimination program. The FY 2023 President's Budget requests $745 million for these two important programs.

FRA also proposes to expand the Confidential Close Call Reporting System (C^3RS) by encouraging the approximately 115,000 employees of the 7 Class I freight railroads to report close calls and unsafe events through the program. This modification to C^3RS will significantly expand available data and provide vital insights into the safety of the industry, allowing railroads and employees to learn from close calls and act to address preventable safety concerns before they can result in harm. Funding requested for FRA's Research and Development account will continue to build the science-based understanding of railroad systems and technologies, with particular focus on root cause analysis and development of countermeasures to prevent trespassing and grade crossing casualties, as well as accidents resulting from track, equipment, and other causes.

- **Economic Strength and Global Competitiveness:** The COVID-19 pandemic severely affected travel demand across all modes of transportation, creating steep revenue shortfalls for many transportation providers, including Amtrak and their state partners. While ridership and revenue have improved since the height of the pandemic, Amtrak's projections for FY 2023 still trail pre-pandemic levels. The FY 2023 President's Budget will ensure Amtrak services are maintained and infrastructure investment is not deferred by providing over $650 million to Amtrak and its state partners to fill revenue shortfalls vs. pre-pandemic operations. FRA's grant programs also support well-paying jobs across the domestic railroad construction, operations, manufacturing, and supply sectors.

  The FY 2023 President's Budget also proposes to establish a National Railroad Institute and Railroad Workforce Development Program to improve railroad industry employee training, recruitment, and retention. These programs are urgently required to strengthen project development and delivery technical capacity, as well as build a more robust and diverse workforce with greater representation from women, minorities, and other underrepresented groups.

- **Equity:** Many century-old rail lines and facilities bisect communities of color and low-income neighborhoods, impeding access to employment opportunities and critical community services. To correct decades of failed land-use policies and under-investment in these underserved and disadvantaged communities, the FY 2023 President's Budget proposes to continue several important improvements to its programs, including:

  - Dedicating at least $200 million in CRISI funds to rail line relocations and other mitigations for the detrimental safety and quality of life effects rail transportation can have on communities. The new Railroad Crossing Elimination program can similarly help communities grade separate or otherwise improve dangerous highway-rail crossings;
  - Reducing statutory cost-sharing requirements for underserved or disadvantaged communities;
  - Increasing funding for workforce development, outreach, and apprenticeship programs to foster greater diversity, equity, and inclusion in the rail industry; and
  - Consistent with the Justice40 Initiative, establishing a goal that at least 40 percent of competitive grant funding for projects benefits underserved or disadvantaged communities in order to build a more equitable transportation system.

- **Climate and Sustainability:** Rail is among the most energy-efficient modes of transportation, moving one-third of all freight on a ton-mile basis, while consuming less than 2 percent of energy used in the transportation sector.[1] Diverting passengers and freight from more carbon-intensive transportation modes to rail would reduce greenhouse gas emissions. The FY 2023 President's Budget is supporting grants and research and development to advance investments in battery technology, electrification, and clean fuels to reduce the negative environmental effects of transportation. FRA is also encouraging short line railroads to apply for proposed CRISI funding to help retire their aging locomotive fleet and replace them with greener technologies that will reduce harmful emissions.

- **Transformation:** Building new rail infrastructure is a multi-generational investment. Many of the rail assets to be funded under the IIJA supplemental funding and proposed FY 2023 grant programs will be able to withstand heavy usage for decades with proper maintenance. The FY 2023 President's Budget requests $555 million for the Federal-State Partnership for Intercity Passenger Rail program, which will help to build new rail corridors and upgrade existing services. Similarly, FRA's research and development efforts are helping to deliver innovative new technologies and practices to enhance rail safety, operating efficiency, maintenance, and asset longevity.

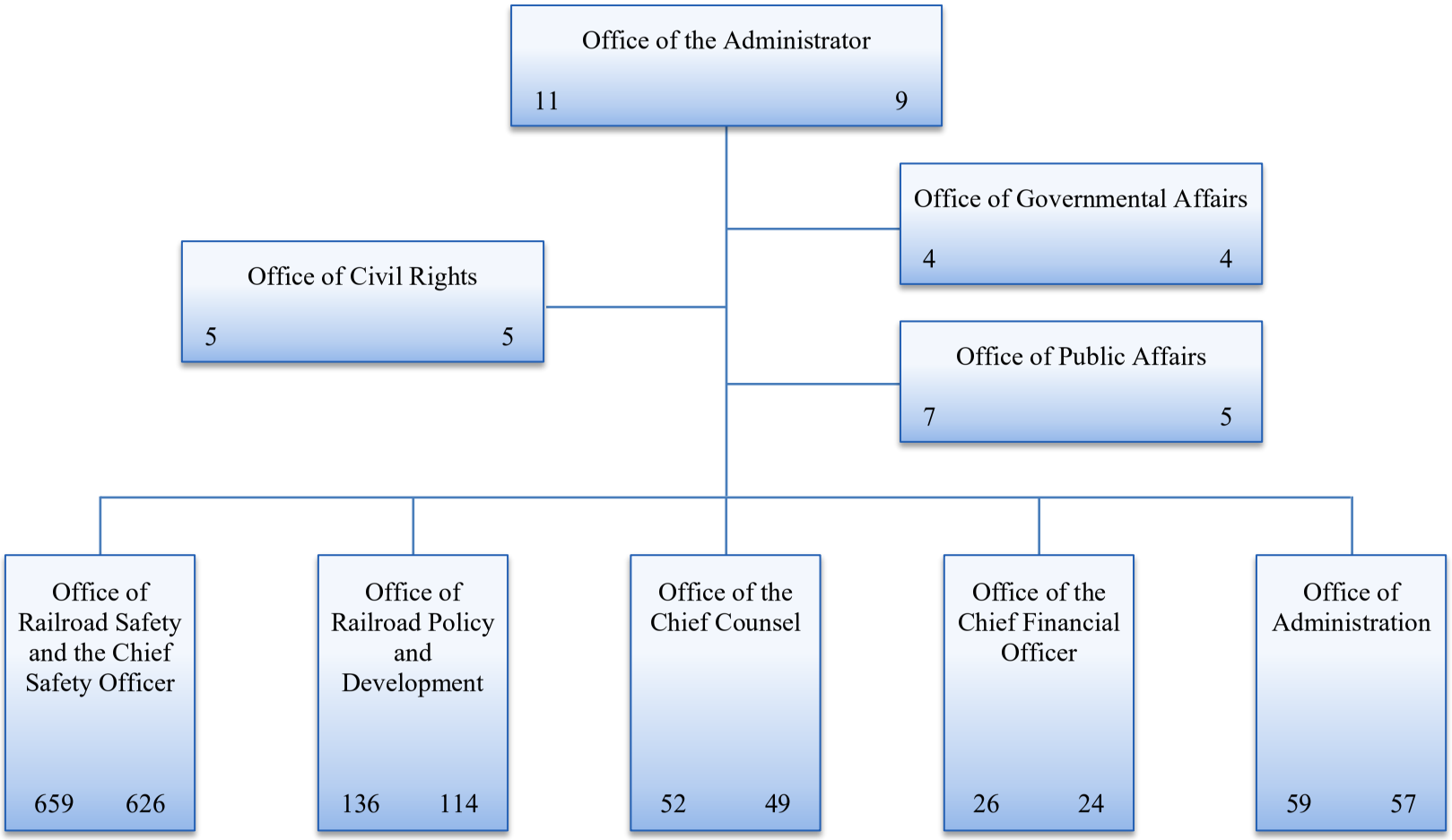
The U.S. rail network is critical to national economic productivity and serves an indispensable role in fulfilling the freight and passenger mobility needs of a population that is expected to increase by nearly 70 million over the next 40 years. The FY 2023 President's Budget request will help FRA in enabling continuous safety, reliability, and efficiency improvements to meet our country's transportation challenges.

[1] U.S. Department of Transportation, Bureau of Transportation Statistics, Energy Consumption by Mode of Transportation, February 2022 and U.S. Ton-Miles of Freight, February 2022.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FY 2022 Organization Chart (Current Organization)

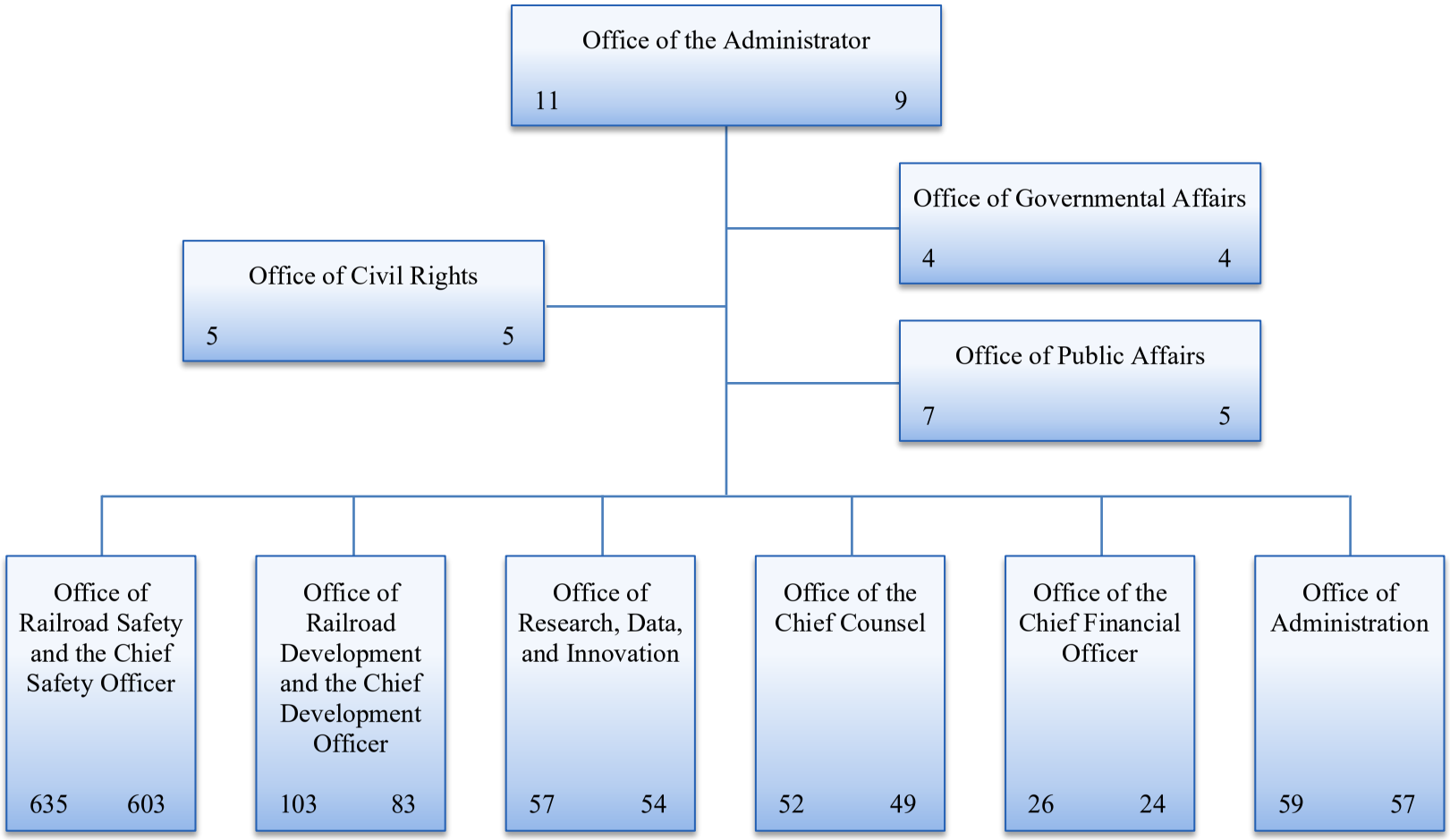
959 Full-Time Positions (FTP); 893 Full-Time Equivalents (FTE)



DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FY 2022 Organization Chart (Proposed Organization)

959 Full-Time Positions (FTP); 893 Full-Time Equivalents (FTE)



DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FY 2023 Organization Chart

1,066 Full-Time Positions (FTP); 1,006 Full-Time Equivalents (FTE)

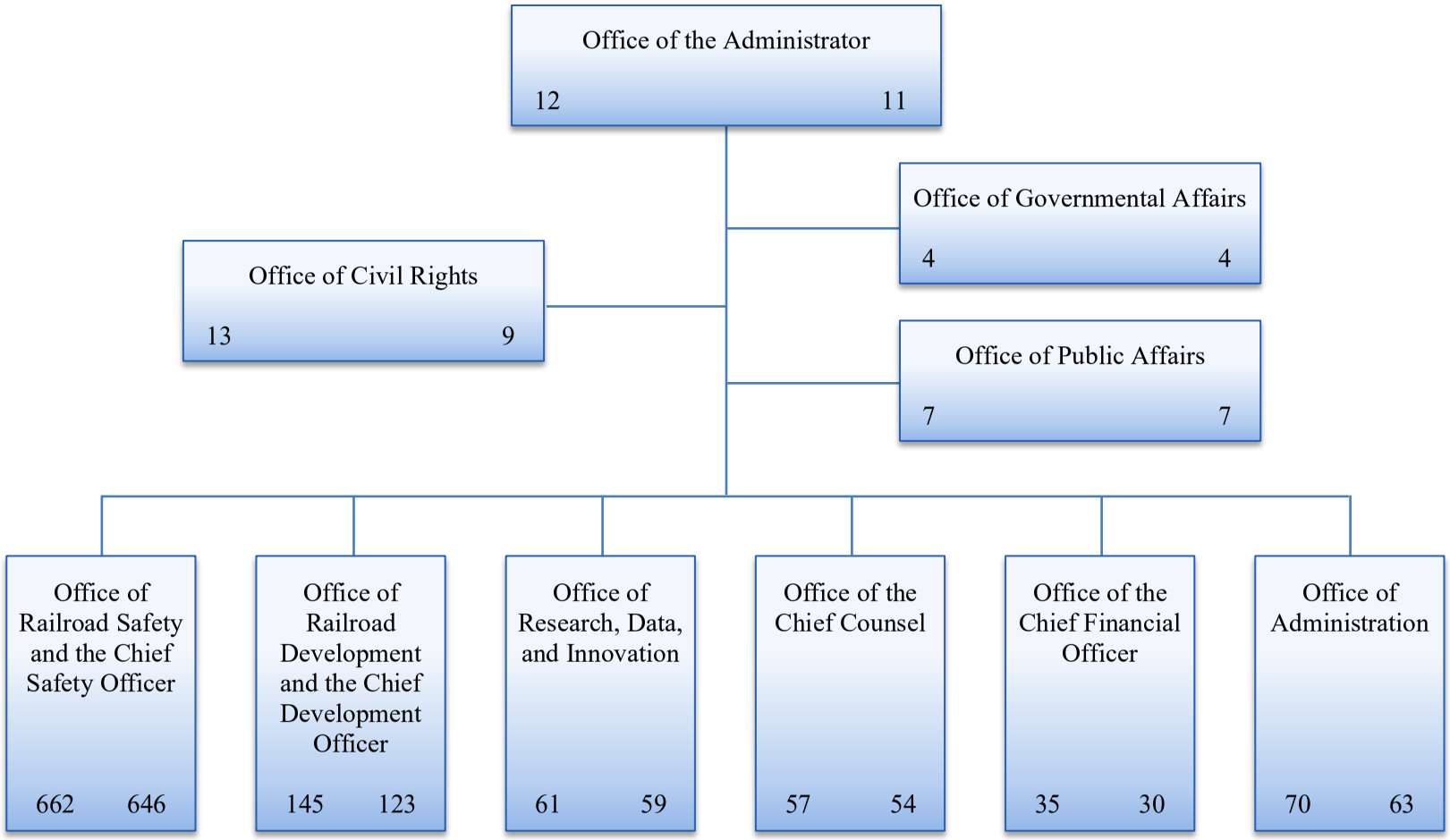


EXHIBIT II-1
FY 2023 BUDGET AUTHORITY
FEDERAL RAILROAD ADMINISTRATION
($000)

ACCOUNT NAME	M / D	(A) FY 2021 ENACTED	(B) FY 2022 CR	(C) FY 2022 ENACTED	(D) FY 2023 PRES. BUDGET
SAFETY AND OPERATIONS (GF)	D	$ 234,905	$ 234,905	$ 240,757	$ 254,426
RAILROAD RESEARCH AND DEVELOPMENT (GF)	D	$ 41,000	$ 41,000	$ 43,000	$ 58,000
NORTHEAST CORRIDOR GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION (GF)	D	$ 700,000	$ 700,000	$ 870,128	$ 1,194,000
Budget Authority		$ 700,000	$ 700,000	$ 874,501	$ 1,200,000
Transfers		$ -	$ -	$ (4,373)	$ (6,000)
NATIONAL NETWORK GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION (GF)	D	$ 1,300,000	$ 1,300,000	$ 1,449,586	$ 1,791,000
Budget Authority		$ 1,300,000	$ 1,300,000	$ 1,456,870	$ 1,800,000
Transfers		$ -	$ -	$ (7,284)	$ (9,000)
CONSOLIDATED RAIL INFRASTRUCTURE AND SAFETY IMPROVEMENTS (GF)	D	$ 375,000	$ 375,000	$ 612,500	$ 490,000
Budget Authority		$ 375,000	$ 375,000	$ 625,000	$ 500,000
Transfers		$ -	$ -	$ (12,500)	$ (10,000)
FEDERAL-STATE PARTNERSHIP FOR INTERCITY PASSENGER RAIL GRANTS (GF)	D	$ 200,000	$ 200,000	$ 98,000	$ 543,900
Budget Authority		$ 200,000	$ 200,000	$ 100,000	$ 555,000
Transfers		$ -	$ -	$ (2,000)	$ (11,100)
RESTORATION AND ENHANCEMENT GRANTS (GF)	D	$ 4,720	$ 4,720	$ -	$ 49,500
Budget Authority		$ 4,720	$ 4,720	$ -	$ 50,000
Transfers		$ -	$ -	$ -	$ (500)
RAILROAD CROSSING ELIMINATION PROGRAM (GF)	D	$ -	$ -	$ -	$ 240,100
Budget Authority		$ -	$ -	$ -	$ 245,000
Transfers		$ -	$ -	$ -	$ (4,900)
FINANCIAL ASSISTANCE OVERSIGHT AND TECHNICAL ASSISTANCE (GF)	D	$ -	$ -	$ 26,157	$ 41,500
Transfers		$ -	$ -	$ 26,157	$ 41,500
MAGNETIC LEVITATION TECHNOLOGY DEPLOYMENT PROGRAM (GF)	D	$ 2,000	$ 2,000	$ -	$ -
RAIL LINE RELOCATION AND IMPROVEMENT	D	$ (12,650)	$ (2,711)	$ -	$ -
Rescissions		$ (12,650)	$ (2,711)	$ -	$ -
CAPITAL AND DEBT SERVICE GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION (GF)	D	$ (10,458)	$ -	$ -	$ -
Rescissions		$ (10,458)	$ -	$ -	$ -
RAILROAD SAFETY TECHNOLOGY PROGRAM (GF)	D	$ (613)	$ -	$ -	$ -
Rescissions		$ (613)	$ -	$ -	$ -

ACCOUNT NAME	M / D	(A) FY 2021 ENACTED	(B) FY 2022 CR	(C) FY 2022 ENACTED	(D) FY 2023 PRES. BUDGET
INTERCITY PASSENGER RAIL GRANT PROGRAM (GF)	**D**	$ (10,165)	$ -	$ -	$ -
Rescissions		$ (10,165)	$ -	$ -	$ -
NEXT GENERATION HIGH SPEED RAIL (GF)	**D**	$ (3,035)	$ (0)	$ -	$ -
Rescissions		$ (3,035)	$ (0)	$ -	$ -
RAILROAD SAFETY GRANTS (GF)	**D**	$ -	$ -	$ (1,715)	$ -
Rescissions		$ -	$ -	$ (1,715)	$ -
CAPITAL ASSISTANCE FOR HIGH SPEED RAIL CORRIDORS AND INTERCITY PASSENGER RAIL SERVICE (GF)	**D**	$ -	$ -	$ (13,327)	$ -
Rescissions		$ -	$ -	$ (13,327)	$ -
Gross New Budget Authority		**$ 2,857,625**	**$ 2,857,625**	**$ 3,340,128**	**$ 4,662,426**
Rescissions		**$ (36,921)**	**$ (2,711)**	**$ (15,042)**	**$ -**
Transfers		**$ -**	**$ -**	**$ -**	**$ -**
NET NEW BUDGET AUTHORITY REQUESTED:		**$ 2,820,704**	**$ 2,854,914**	**$ 3,325,086**	**$ 4,662,426**
[Discretionary BA]		$ 2,820,704	$ 2,854,914	$ 3,325,086	$ 4,662,426
Supplemental Funding					
COVID-19 Supplementals		$ 2,700,000	$ -	$ -	$ -
Northeast Corridor Grants to the National Railroad Passenger Corporation	**M/D**	$ 1,625,819	$ -	$ -	$ -
National Network Grants to the National Railroad Passenger Corporation	**M/D**	$ 1,074,181	$ -	$ -	$ -
IIJA Supplemental (Division J), net transfers		$ -	$ 13,199,010	$ 13,199,010	$ 13,199,010
Northeast Corridor Grants to the National Railroad Passenger Corporation	**D**	$ -	$ 1,194,000	$ 1,194,000	$ 1,194,000
National Network Grants to the National Railroad Passenger Corporation	**D**	$ -	$ 3,184,000	$ 3,184,000	$ 3,184,000
Consolidated Rail Infrastructure and Safety Improvements	**D**	$ -	$ 980,000	$ 980,000	$ 980,000
Federal-State Partnership for Intercity Passenger Rail Grants	**D**	$ -	$ 7,056,000	$ 7,056,000	$ 7,056,000
Railroad Crossing Elimination Program	**D**	$ -	$ 588,000	$ 588,000	$ 588,000
Financial Assistance Oversight And Technical Assistance (transfers from FRA accounts)	**D**	$ -	$ 198,000	$ 198,000	$ 198,000
Transfer to DOT Office of Inspector General	**D**	$ -	$ (495)	$ (495)	$ (495)
Transfer to Amtrak Office of Inspector General	**D**	$ -	$ (495)	$ (495)	$ (495)
Grand Total, All Appropriations		**$ 5,520,704**	**$ 16,053,924**	**$ 16,524,096**	**$ 17,861,436**

EXHIBIT II-2
FY 2023 TOTAL BUDGETARY RESOURCES BY APPROPRIATION ACCOUNT
FEDERAL RAILROAD ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

ACCOUNT NAME	M / D	(A) FY 2021 ENACTED	(B) FY 2022 CR	(C) FY 2022 ENACTED	(D) FY 2023 PRES. BUDGET
SAFETY AND OPERATIONS (GF)	D	$ 234,905	$ 234,905	$ 240,757	$ 254,426
RAILROAD RESEARCH AND DEVELOPMENT (GF)	D	$ 41,000	$ 41,000	$ 43,000	$ 58,000
NORTHEAST CORRIDOR GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION (GF)	D	$ 700,000	$ 700,000	$ 870,128	$ 1,194,000
Budget Authority		$ 700,000	$ 700,000	$ 874,501	$ 1,200,000
Transfers		$ -	$ -	$ (4,373)	$ (6,000)
NATIONAL NETWORK GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION (GF)	D	$ 1,300,000	$ 1,300,000	$ 1,449,586	$ 1,791,000
Budget Authority		$ 1,300,000	$ 1,300,000	$ 1,456,870	$ 1,800,000
Transfers		$ -	$ -	$ (7,284)	$ (9,000)
CONSOLIDATED RAIL INFRASTRUCTURE AND SAFETY IMPROVEMENTS (GF)	D	$ 375,000	$ 375,000	$ 612,500	$ 490,000
Budget Authority		$ 375,000	$ 375,000	$ 625,000	$ 500,000
Transfers		$ -	$ -	$ (12,500)	$ (10,000)
FEDERAL-STATE PARTNERSHIP FOR INTERCITY PASSENGER RAIL GRANTS (GF)	D	$ 200,000	$ 200,000	$ 98,000	$ 543,900
Budget Authority		$ 200,000	$ 200,000	$ 100,000	$ 555,000
Transfers		$ -	$ -	$ (2,000)	$ (11,100)
RESTORATION AND ENHANCEMENT GRANTS (GF)	D	$ 4,720	$ 4,720	$ -	$ 49,500
Budget Authority		$ 4,720	$ 4,720	$ -	$ 50,000
Transfers		$ -	$ -	$ -	$ (500)
RAILROAD CROSSING ELIMINATION PROGRAM (GF)	D	$ -	$ -	$ -	$ 240,100
Budget Authority		$ -	$ -	$ -	$ 245,000
Transfers		$ -	$ -	$ -	$ (4,900)
FINANCIAL ASSISTANCE OVERSIGHT AND TECHNICAL ASSISTANCE (GF)	D	$ -	$ -	$ 26,157	$ 41,500
Transfers		$ -	$ -	$ 26,157	$ 41,500
MAGNETIC LEVITATION TECHNOLOGY DEPLOYMENT PROGRAM (GF)	D	$ 2,000	$ 2,000	$ -	$ -
RAIL LINE RELOCATION AND IMPROVEMENT	D	$ (12,650)	$ (2,711)	$ -	$ -
Rescissions		$ (12,650)	$ (2,711)	$ -	$ -
CAPITAL AND DEBT SERVICE GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION (GF)	D	$ (10,458)	$ -	$ -	$ -
Rescissions		$ (10,458)	$ -	$ -	$ -
RAILROAD SAFETY TECHNOLOGY PROGRAM (GF)	D	$ (613)	$ -	$ -	$ -
Rescissions		$ (613)	$ -	$ -	$ -

ACCOUNT NAME	M / D	(A) FY 2021 ENACTED	(B) FY 2022 CR	(C) FY 2022 ENACTED	(D) FY 2023 PRES. BUDGET
INTERCITY PASSENGER RAIL GRANT PROGRAM (GF)	**D**	$ (10,165)	$ -	$ -	$ -
Rescissions		$ (10,165)	$ -	$ -	$ -
NEXT GENERATION HIGH SPEED RAIL (GF)	**D**	$ (3,035)	$ (0)	$ -	$ -
Rescissions		$ (3,035)	$ (0)	$ -	$ -
RAILROAD SAFETY GRANTS (GF)	**D**	$ -	$ -	$ (1,715)	$ -
Rescissions		$ -	$ -	$ (1,715)	$ -
CAPITAL ASSISTANCE FOR HIGH SPEED RAIL CORRIDORS AND INTERCITY PASSENGER RAIL SERVICE (GF)	**D**	$ -	$ -	$ (13,327)	$ -
Rescissions		$ -	$ -	$ (13,327)	$ -
Gross New Budgetary Resources		**$ 2,857,625**	**$ 2,857,625**	**$ 3,340,128**	**$ 4,662,426**
Rescissions		**$ (36,921)**	**$ (2,711)**	**$ (15,042)**	**$ -**
Transfers		**$ -**	**$ -**	**$ -**	**$ -**
TOTAL BUDGETARY RESOURCES:		**$ 2,820,704**	**$ 2,854,914**	**$ 3,325,086**	**$ 4,662,426**
[Discretionary BA]		$ 2,820,704	$ 2,854,914	$ 3,325,086	$ 4,662,426
Supplemental Funding					
COVID-19 Supplementals		$ 2,700,000	$ -	$ -	$ -
Northeast Corridor Grants to the National Railroad Passenger Corporation	**M/D**	$ 1,625,819	$ -	$ -	$ -
National Network Grants to the National Railroad Passenger Corporation	**M/D**	$ 1,074,181	$ -	$ -	$ -
IIJA Supplemental (Division J), net transfers		$ -	$ 13,199,010	$ 13,199,010	$ 13,199,010
Northeast Corridor Grants to the National Railroad Passenger Corporation	**D**	$ -	$ 1,194,000	$ 1,194,000	$ 1,194,000
National Network Grants to the National Railroad Passenger Corporation	**D**	$ -	$ 3,184,000	$ 3,184,000	$ 3,184,000
Consolidated Rail Infrastructure and Safety Improvements	**D**	$ -	$ 980,000	$ 980,000	$ 980,000
Federal-State Partnership for Intercity Passenger Rail Grants	**D**	$ -	$ 7,056,000	$ 7,056,000	$ 7,056,000
Railroad Crossing Elimination Program	**D**	$ -	$ 588,000	$ 588,000	$ 588,000
Financial Assistance Oversight And Technical Assistance (transfers from FRA accounts)	**D**	$ -	$ 198,000	$ 198,000	$ 198,000
Transfer to DOT Office of Inspector General	**D**	$ -	$ (495)	$ (495)	$ (495)
Transfer to Amtrak Office of Inspector General	**D**	$ -	$ (495)	$ (495)	$ (495)
Grand Total, All Appropriations		**$ 5,520,704**	**$ 16,053,924**	**$ 16,524,096**	**$ 17,861,436**

EXHIBIT II-3
FY 2023 BUDGET REQUEST BY DOT STRATEGIC AND ORGANIZATIONAL GOALS
Appropriations, Obligation Limitation, and Exempt Obligations
FEDERAL RAILROAD ADMINISTRATION
($000)

	Safety	Economic Strength and Global Competitiveness	Equity	Climate and Sustainability	Transformation	Organizational Excellence	Total
Base Appropriations	**$ 825,773**	**$ 1,009,218**	**$ 1,131,795**	**$ 1,000,053**	**$ 625,720**	**$ 69,868**	**$ 4,662,426**
Safety and Operations	$ 152,840	$ 21,865	$ 23,591	$ 21,865	$ 21,865	$ 12,401	$ 254,426
Railroad Research and Development	$ 15,668	$ 3,127	$ 1,967	$ 5,967	$ 27,305	$ 3,967	$ 58,000
Northeast Corridor Grants to the National Passenger Railroad Corporation	$ 237,600	$ 237,600	$ 237,600	$ 237,600	$ 237,600	$ 6,000	$ 1,194,000
National Network Grants to the National Passenger Railroad Corporation	$ 165,600	$ 476,267	$ 476,267	$ 476,267	$ 190,600	$ 6,000	$ 1,791,000
Consolidated Rail Infrastructure and Safety Improvements	$ 98,000	$ 98,000	$ 196,000	$ 98,000	$ -	$ -	$ 490,000
Federal-State Partnership for Intercity Passenger Rail Grants	$ -	$ 135,975	$ 135,975	$ 135,975	$ 135,975	$ -	$ 543,900
Restoration and Enhancement Grants	$ -	$ 12,375	$ 12,375	$ 12,375	$ 12,375	$ -	$ 49,500
Railroad Crossing Elimination Program	$ 156,065	$ 24,010	$ 48,020	$ 12,005	$ -	$ -	$ 240,100
Financial Assistance Oversight and Technical Assistance	$ -	$ -	$ -	$ -	$ -	$ 41,500	$ 41,500
IIJA Supplemental Advance Appropriations:	**$ 1,371,600**	**$ 2,812,200**	**$ 3,467,000**	**$ 2,782,800**	**$ 2,557,400**	**$ 208,010**	**$ 13,199,010**
Northeast Corridor Grants to the National Passenger Railroad Corporation	$ 221,800	$ 221,800	$ 301,800	$ 221,800	$ 221,800	$ 5,000	$ 1,194,000
National Network Grants to the National Passenger Railroad Corporation	$ 571,600	$ 571,600	$ 891,600	$ 571,600	$ 571,600	$ 6,000	$ 3,184,000
Consolidated Rail Infrastructure and Safety Improvements	$ 196,000	$ 196,000	$ 392,000	$ 196,000	$ -	$ -	$ 980,000
Federal-State Partnership for Intercity Passenger Rail Grants	$ -	$ 1,764,000	$ 1,764,000	$ 1,764,000	$ 1,764,000	$ -	$ 7,056,000
Railroad Crossing Elimination Program	$ 382,200	$ 58,800	$ 117,600	$ 29,400	$ -	$ -	$ 588,000
Financial Assistance Oversight and Technical Assistance	$ -	$ -	$ -	$ -	$ -	$ 197,010	$ 197,010
TOTAL	**$ 2,197,373**	**$ 3,821,418**	**$ 4,598,795**	**$ 3,782,853**	**$ 3,183,120**	**$ 277,878**	**$ 17,861,436**

Note: This exhibit includes transfers to and from the Financial Assistance Oversight and Technical Assistance account.

Safety: Make our transportation system safer for all people. Advance a future without transportation-related serious injuries and fatalities.

Economic Strength and Global Competitiveness: Grow an inclusive and sustainable economy. Invest in our transportation system to provide American workers and businesses reliable and efficient access to resources, markets, and good-paying jobs.

Equity: Reduce inequities across our transportation systems and the communities they affect. Support and engage people and communities to promote safe, affordable, accessible, and multimodal access to opportunities and services while reducing transportation-related disparities, adverse community impacts, and health effects.

Climate and Sustainability: Tackle the climate crisis by ensuring that transportation plays a central role in the solution. Substantially reduce greenhouse gas emissions and transportation-related pollution and build more resilient and sustainable transportation systems to benefit and protect communities.

Transformation: Design for the future. Invest in purpose-driven research and innovation to meet the challenge of the present and modernize a transportation system of the future that serves everyone today and in the decades to come.

Organizational Excellence: Strengthen our world class organization. Advance the Department's mission by establishing policies, processes, and an inclusive and innovative culture to effectively serve communities and responsibly steward the public's resources.

EXHIBIT II-4
FY 2023 OUTLAYS
FEDERAL RAILROAD ADMINISTRATION
($000)

		(A)	(B)	(C)
	M / D	FY 2021 ENACTED	FY 2022 CR	FY 2023 REQUEST
SAFETY AND OPERATIONS	D	$ 224,584	$ 282,000	$ 256,000
RAILROAD RESEARCH AND DEVELOPMENT	D	$ 40,391	$ 44,000	$ 52,000
GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION	D	$ (219)	$ 8,000	$ 13,000
NORTHEAST CORRIDOR GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION	D	$ 698,215	$ 694,000	$ 1,185,000
NATIONAL NETWORK GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION	D	$ 1,301,157	$ 1,295,000	$ 1,790,000
CAPITAL AND DEBT SERVICE GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION	D	$ 121	$ 1,000	$ -
CONSOLIDATED RAIL INFRASTRUCTURE AND SAFETY IMPROVEMENTS	D	$ 63,591	$ 207,000	$ 224,000
FEDERAL-STATE PARTNERSHIP FOR INTERCITY PASSENGER RAIL	D	$ 2,235	$ 40,000	$ 188,000
RESTORATION AND ENHANCEMENT GRANTS	D	$ 65	$ -	$ 1,000
RAILROAD CROSSING ELIMINATION PROGRAM	D	$ -	$ -	$ -
FINANCIAL ASSISTANCE OVERSIGHT AND TECHNICAL ASSISTANCE	D	$ -	$ -	$ 2,000
RAILROAD SAFETY GRANTS	D	$ 5,640	$ 14,000	$ 3,000
CAPITAL ASSISTANCE TO STATES - INTERCITY PASSENGER RAIL SERVICE	D	$ 3,113	$ 5,000	$ 2,000
NORTHEAST CORRIDOR IMPROVEMENT PROGRAM	D	$ 5,482	$ 9,000	$ 3,000
PENNSYLVANIA STATION REDEVELOPMENT PROJECT	D	$ 313	$ -	$ -
CAPITAL ASSISTANCE FOR HIGH SPEED RAIL CORRIDORS AND INTERCITY PASSENGER RAIL SERVICE	D	$ 11,730	$ 41,000	$ 56,000
NEXT GENERATION HIGH-SPEED RAIL	D	$ -	$ 1,000	$ -
RAIL LINE RELOCATION AND IMPROVEMENT PROGRAM	D	$ 143	$ -	$ -
RAILROAD SAFETY TECHNOLOGY PROGRAM	D	$ -	$ 1,000	$ -

	M / D	(A) FY 2021 ENACTED	(B) FY 2022 CR	(C) FY 2023 REQUEST
MAGNETIC LEVITATION TECHNOLOGY DEPLOYMENT PROGRAM	**D**	$ -	$ -	$ -
TOTAL:		**$ 2,356,561**	**$ 2,642,000**	**$ 3,775,000**
Discretionary		$ 2,356,561	$ 2,642,000	$ 3,775,000
Supplemental Funding				
COVID-19 Supplementals				
NORTHEAST CORRIDOR GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION	**M/D**	$ 1,624,819	$ -	$ -
NATIONAL NETWORK GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION	**M/D**	$ 1,072,166	$ -	$ -
IIJA Supplemental (Division J)				
NORTHEAST CORRIDOR GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION	**D**	$ -	$ 1,191,000	$ 1,194,000
NATIONAL NETWORK GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION	**D**	$ -	$ 3,182,000	$ 3,184,000
CONSOLIDATED RAIL INFRASTRUCTURE AND SAFETY IMPROVEMENTS	**D**	$ -	$ -	$ -
FEDERAL-STATE PARTNERSHIP FOR INTERCITY PASSENGER RAIL	**D**	$ -	$ -	$ -
RESTORATION AND ENHANCEMENT GRANTS	**D**	$ -	$ -	$ -
RAILROAD CROSSING ELIMINATION PROGRAM	**D**	$ -	$ -	$ -
FINANCIAL ASSISTANCE OVERSIGHT AND TECHNICAL ASSISTANCE	**D**	$ -	$ 12,000	$ 28,000
Grand Total, Outlays from all Appropriations		**$ 5,053,546**	**$ 7,027,000**	**$ 8,181,000**

EXHIBIT II-5
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
FEDERAL RAILROAD ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

FRA Total			Baseline Changes									
	FY 2021 Enacted	FY 2022 CR	Annualization of Prior Pay Raises	Annualization of new FY 2022 FTE	FY 2023 Pay Raises	Adjustment for Compensable Days (260 days)	GSA Rent	WCF Increase/ Decrease	Inflation and other adjustments to base	FY 2023 Baseline Estimate	Program Increases/ Decreases	FY 2023 Request
PERSONNEL RESOURCES (FTE)												
Direct FTE	872	893	-	-	-	-	-	-	-	893	113	1,006
FINANCIAL RESOURCES												
ADMINISTRATIVE EXPENSES												
Salaries and Benefits	147,828	152,066	380	-	5,259	(604)	-	-	1,261	158,363	20,582	178,945
Benefits for Former Employees (AK RR)	600	512	-	-	-	-	-	-	-	512	-	512
Travel	10,820	10,498	-	-	-	-	-	-	200	10,698	1,049	11,747
Transportation	60	25	-	-	-	-	-	-	1	26	15	40
GSA Rent	6,560	5,566	-	-	-	-	913	-	(990)	5,490	-	5,490
Communications, & Utilities	126	112	-	-	-	-	-	-	2	114	63	177
Printing	528	528	-	-	-	-	-	-	-	528	(10)	518
Other Services:												
-WCF	19,093	22,158	-	-	-	-	-	1,311	-	23,468	-	23,468
-ESC	2,282	2,143	-	-	-	-	-	-	10	2,153	-	2,153
-Other contracts	32,239	220,286	-	-	-	-	-	-	112	220,398	14,506	234,904
Supplies	528	444	-	-	-	-	-	-	9	453	53	506
Equipment	1,953	4,034	-	-	-	-	-	-	6	4,040	(406)	3,634
Insurance Claims & Settlements	2,400	400	-	-	-	-	-	-	-	400	(200)	200
Admin Subtotal	**225,016**	**418,772**	**380**	**-**	**5,259**	**(604)**	**913**	**1,311**	**611**	**426,643**	**35,652**	**462,295**
PROGRAMS												
Safety and Operations	33,440	33,654	-	-	-	-	-	-	212	33,865	1,690	35,555
Railroad Research and Development	37,276	37,276	-	-	-	-	-	-	814	38,090	15,986	54,076
Grants to Amtrak	4,685,970	6,368,000	-	-	-	-	-	-	39,800	6,407,800	955,200	7,363,000
Consolidated Rail Infrastructure and Safety Improvements	371,250	1,351,250	-	-	-	-	-	-	7,425	1,358,675	111,325	1,470,000
Federal-State Partnership for State of Good Repair	198,000	7,254,000	-	-	-	-	-	-	3,960	7,257,960	341,940	7,599,900
Restoration and Enhancement Grants	4,673	4,673	-	-	-	-	-	-	93	4,766	44,734	49,500
Railroad Crossing Elimination Program	-	588,000	-	-	-	-	-	-	-	588,000	240,100	828,100
Financial Assistance Oversight and Technical Assistance	-	-	-	-	-	-	-	-	-	-	-	-
Magnetic Levitation Technology Deployment Program	2,000	2,000	-	-	-	-	-	-	-	2,000	(2,000)	-
Programs Subtotal	**5,332,609**	**15,638,853**	**-**	**-**	**-**	**-**	**-**	**-**	**52,304**	**15,691,157**	**1,708,974**	**17,400,131**
TOTAL	**5,557,625**	**16,057,625**	**380**	**-**	**5,259**	**(604)**	**913**	**1,311**	**52,915**	**16,117,799**	**1,744,627**	**17,862,426**

FRA Total			Baseline Changes									
	FY 2021 Enacted	FY 2022 CR	Annualization of Prior Pay Raises	Annualization of new FY 2022 FTE	FY 2023 Pay Raises	Adjustment for Compensable Days (260 days)	GSA Rent	WCF Increase/ Decrease	Inflation and other adjustments to base	FY 2023 Baseline Estimate	Program Increases/ Decreases	FY 2023 Request
CANCELLATIONS												
Rail Line Relocation and Improvement Program	(12,650)	(2,711)	-	-	-	-	-	-	2,711	-	-	-
Capital And Debt Service Grants to the National Railroad Passenger Corporation	(10,458)	-	-	-	-	-	-	-	-	-	-	-
Railroad Safety Technology Program	(613)	-	-	-	-	-	-	-	-	-	-	-
Intercity Passenger Rail Grant Program	(10,165)	-	-	-	-	-	-	-	-	-	-	-
Next Generation High Speed Rail	(3,035)	(0)	-	-	-	-	-	-	0	-	-	-
Cancellations Subtotal	**(36,921)**	**(2,711)**	**-**	**-**	**-**	**-**	**-**	**-**	**2,711**	**-**	**-**	**-**
TRANSFERS												
Financial Assistance Oversight and Technical Assistance	-	(990)	-	-	-	-	-	-	-	(990)	-	(990)
Transfers Subtotal	**-**	**(990)**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**(990)**	**-**	**(990)**
TOTAL with Cancellations and Transfers	**5,520,704**	**16,053,924**	**380**	**-**	**5,259**	**(604)**	**913**	**1,311**	**55,627**	**16,116,809**	**1,744,627**	**17,861,436**

EXHIBIT II-5
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
FEDERAL RAILROAD ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Safety & Operations			Baseline Changes									
	FY 2021 Enacted	FY 2022 CR	Annualization of Prior Pay Raises	Annualization of new FY 2022 FTE	FY 2023 Pay Raises	Adjustment for Compensable Days (260 days)	GSA Rent	WCF Increase/ Decrease	Inflation and other adjustments to base	FY 2023 Baseline Estimate	Program Increases/ Decreases	FY 2023 Request
PERSONNEL RESOURCES (FTE)												
Direct FTE	857	856	-	-	-	-	-	-	-	856	59	915
FINANCIAL RESOURCES												
ADMINISTRATIVE EXPENSES												
Salaries and Benefits [1/]	144,748	145,273	363	-	5,024	(577)	-	-	1,179	151,262	10,426	161,688
Benefits for Former Employees (AK RR)	600	512	-	-	-	-	-	-	-	512	-	512
Travel	10,410	9,988	-	-	-	-	-	-	200	10,188	604	10,792
Transportation	60	25	-	-	-	-	-	-	1	26	15	40
GSA Rent	6,560	5,566	-	-	-	-	913	-	(990)	5,490	-	5,490
Communications, & Utilities	126	112	-	-	-	-	-	-	2	114	63	177
Printing	510	510	-	-	-	-	-	-	-	510	(10)	500
Other Services:												
-WCF	19,093	22,158	-	-	-	-	-	1,311	-	23,468	-	23,468
-ESC	2,282	2,143	-	-	-	-	-	-	10	2,153	-	2,153
-Other contracts	12,496	13,386	-	-	-	-	-	-	-	13,386	(176)	13,210
Supplies	528	444	-	-	-	-	-	-	9	453	53	506
Equipment	1,653	734	-	-	-	-	-	-	-	734	(600)	134
Insurance Claims & Settlements	2,400	400	-	-	-	-	-	-	-	400	(200)	200
Admin Subtotal	**201,465**	**201,251**	**363**	**-**	**5,024**	**(577)**	**913**	**1,311**	**411**	**208,696**	**10,175**	**218,871**
PROGRAMS												
Automated Track Inspection Program	16,500	16,500	-	-	-	-	-	-	-	16,500	-	16,500
Rail Safety Partnership (C3RS)	3,000	3,000	-	-	-	-	-	-	60	3,060	1,240	4,300
Railroad Safety Information System (RSIS)	4,400	4,400	-	-	-	-	-	-	88	4,488	12	4,500
Rail Grade Crossing Safety	1,325	1,325	-	-	-	-	-	-	-	1,325	(150)	1,175
Washington Union Station	800	1,200	-	-	-	-	-	-	-	1,200	-	1,200
Positive Train Control (PTC) Support	500	500	-	-	-	-	-	-	10	510	490	1,000
Drug and Alcohol Program	1,169	1,169	-	-	-	-	-	-	-	1,169	(269)	900
Security, Other Security Grants	580	580	-	-	-	-	-	-	5	585	-	585
Rail Safety Advisory Committee (RSAC)	20	20	-	-	-	-	-	-	0	20	100	120
Technical Training Standards Division	551	551	-	-	-	-	-	-	11	562	438	1,000
Transportation Technology Center (TTC)	500	-	-	-	-	-	-	-	-	-	-	-
Cybersecurity Threat Assessment	500	-	-	-	-	-	-	-	-	-	-	-
Audit Management	225	250	-	-	-	-	-	-	-	250	(25)	225
Trespass Prevention	2,300	2,300	-	-	-	-	-	-	-	2,300	(1,900)	400
Safe Transportation of Energy Products [2/]	-	-	-	-	-	-	-	-	-	-	-	-
Other Safety Grants	570	350	-	-	-	-	-	-	7	357	293	650
Grant & Project Development Technical Assistance and Oversight	500	1,509	-	-	-	-	-	-	30	1,539	1,461	3,000
Programs Subtotal	**33,440**	**33,654**	**-**	**-**	**-**	**-**	**-**	**-**	**212**	**33,865**	**1,690**	**35,555**
TOTAL	**234,905**	**234,905**	**363**	**-**	**5,024**	**(577)**	**913**	**1,311**	**622**	**242,561**	**11,865**	**254,426**

[1/] In the Salaries and Benefits row's FY 2021 Enacted column, the amount of $144,748 includes estimated salaries charged to the STEP program ($2,000).
[2/] The Safe Transportation of Energy Products (STEP) row's FY 2021 Enacted column has additional resources from Payroll ($2,000) that are not reflected in this line.

EXHIBIT II-5
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
FEDERAL RAILROAD ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Railroad Reseach and Development			Baseline Changes									
	FY 2021 Enacted	FY 2022 CR	Annualization of Prior Pay Raises	Annualization of new FY 2022 FTE	FY 2023 Pay Raises	Adjustment for Compensable Days (260 days)	GSA Rent	WCF Increase/ Decrease	Inflation and other adjustments to base	FY 2023 Baseline Estimate	Program Increases/ Decreases	FY 2023 Request
PERSONNEL RESOURCES (FTE)												
Direct FTE	-	-	-	-	-	-	-	-	-	-	-	-
FINANCIAL RESOURCES												
ADMINISTRATIVE EXPENSES												
Salaries and Benefits	-	-	-	-	-	-	-	-	-	-	-	-
Benefits for Former Employees (AK RR)	-	-	-	-	-	-	-	-	-	-	-	-
Travel	120	120	-	-	-	-	-	-	-	120	-	120
Transportation	-	-	-	-	-	-	-	-	-	-	-	-
GSA Rent	-	-	-	-	-	-	-	-	-	-	-	-
Communications, & Utilities	-	-	-	-	-	-	-	-	-	-	-	-
Printing	18	18	-	-	-	-	-	-	-	18	-	18
Other Services:												
-WCF	-	-	-	-	-	-	-	-	-	-	-	-
-ESC	-	-	-	-	-	-	-	-	-	-	-	-
-Other contracts	3,286	3,286	-	-	-	-	-	-	-	3,286	-	3,286
Supplies	-	-	-	-	-	-	-	-	-	-	-	-
Equipment	300	300	-	-	-	-	-	-	6	306	194	500
Insurance Claims & Settlements	-	-	-	-	-	-	-	-	-	-	-	-
Admin Subtotal	**3,724**	**3,724**	**-**	**-**	**-**	**-**	**-**	**-**	**6**	**3,730**	**194**	**3,924**
PROGRAMS												
Track Research Program	10,179	10,179	-	-	-	-	-	-	204	10,383	1,296	11,679
Rolling Stock Program	10,322	10,322	-	-	-	-	-	-	206	10,528	144	10,672
Train Control & Communications	8,086	8,086	-	-	-	-	-	-	162	8,248	838	9,086
Human Factors Program	6,042	6,042	-	-	-	-	-	-	121	6,163	629	6,792
Railroad System Issues	2,647	2,647	-	-	-	-	-	-	121	2,768	13,079	15,847
Programs Subtotal	**37,276**	**37,276**	**-**	**-**	**-**	**-**	**-**	**-**	**814**	**38,090**	**15,986**	**54,076**
TOTAL	**41,000**	**41,000**	**-**	**-**	**-**	**-**	**-**	**-**	**820**	**41,820**	**16,180**	**58,000**

EXHIBIT II-5
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
FEDERAL RAILROAD ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Amtrak	FY 2021 Enacted [1/]	FY 2022 CR	Baseline Changes: Annualization of Prior Pay Raises	Annualization of new FY 2022 FTE	FY 2023 Pay Raises	Adjustment for Compensable Days (260 days)	GSA Rent	WCF Increase/ Decrease	Inflation and other adjustments to base	FY 2023 Baseline Estimate	Program Increases/ Decreases	FY 2023 Request
PERSONNEL RESOURCES (FTE) [2/]												
Direct FTE	15	13	-	-	-	-	-	-	-	13	(13)	-
FINANCIAL RESOURCES												
ADMINISTRATIVE EXPENSES [2/]												
Salaries and Benefits	3,080	2,388	6	-	83	(9)	-	-	82	2,549	(2,549)	-
Benefits for Former Employees (AK RR)	-	-	-	-	-	-	-	-	-	-	-	-
Travel	100	150	-	-	-	-	-	-	-	150	(150)	-
Transportation	-	-	-	-	-	-	-	-	-	-	-	-
GSA Rent	-	-	-	-	-	-	-	-	-	-	-	-
Communications, & Utilities	-	-	-	-	-	-	-	-	-	-	-	-
Printing	-	-	-	-	-	-	-	-	-	-	-	-
Other Services:												
-WCF	-	-	-	-	-	-	-	-	-	-	-	-
-ESC	-	-	-	-	-	-	-	-	-	-	-	-
-Other contracts	10,850	7,462	-	-	-	-	-	-	-	7,462	(7,462)	-
Supplies	-	-	-	-	-	-	-	-	-	-	-	-
Equipment	-	-	-	-	-	-	-	-	-	-	-	-
Insurance Claims & Settlements	-	-	-	-	-	-	-	-	-	-	-	-
Admin Subtotal	**14,030**	**10,000**	**6**	**-**	**83**	**(9)**	**-**	**-**	**82**	**10,161**	**(10,161)**	**-**
PROGRAMS												
Northeast Corridor Grants to Amtrak	2,320,304	696,500	-	-	-	-	-	-	13,930	710,430	483,570	1,194,000
National Network Grants to Amtrak	2,365,666	1,293,500	-	-	-	-	-	-	25,870	1,319,370	471,630	1,791,000
Programs Subtotal	**4,685,970**	**1,990,000**	**-**	**-**	**-**	**-**	**-**	**-**	**39,800**	**2,029,800**	**955,200**	**2,985,000**
TOTAL	**4,700,000**	**2,000,000**	**6**	**-**	**83**	**(9)**	**-**	**-**	**39,882**	**2,039,961**	**945,039**	**2,985,000**

1/ The FY 2021 Enacted column includes FY 2021 supplemental funds for COVID-19.

2/ FY 2023 Personnel Resources and Administrative Expenses of $15 million are being transferred to the Financial Assistance Oversight and Technical Assistance account.

EXHIBIT II-5
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
FEDERAL RAILROAD ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Amtrak (IIJA Supplemental)			Baseline Changes									
	FY 2021 Enacted	FY 2022 CR	Annualization of Prior Pay Raises	Annualization of new FY 2022 FTE	FY 2023 Pay Raises	Adjustment for Compensable Days (260 days)	GSA Rent	WCF Increase/ Decrease	Inflation and other adjustments to base	FY 2023 Baseline Estimate	Program Increases/ Decreases	FY 2023 Request
PERSONNEL RESOURCES (FTE)												
Direct FTE	-	-	-	-	-	-	-	-	-	-	-	-
FINANCIAL RESOURCES												
ADMINISTRATIVE EXPENSES [1/]												
Salaries and Benefits	-	-	-	-	-	-	-	-	-	-	-	-
Benefits for Former Employees (AK RR)	-	-	-	-	-	-	-	-	-	-	-	-
Travel	-	-	-	-	-	-	-	-	-	-	-	-
Transportation	-	-	-	-	-	-	-	-	-	-	-	-
GSA Rent	-	-	-	-	-	-	-	-	-	-	-	-
Communications, & Utilities	-	-	-	-	-	-	-	-	-	-	-	-
Printing	-	-	-	-	-	-	-	-	-	-	-	-
Other Services:												
-WCF	-	-	-	-	-	-	-	-	-	-	-	-
-ESC	-	-	-	-	-	-	-	-	-	-	-	-
-Other contracts	-	-	-	-	-	-	-	-	-	-	-	-
Supplies	-	-	-	-	-	-	-	-	-	-	-	-
Equipment	-	-	-	-	-	-	-	-	-	-	-	-
Insurance Claims & Settlements	-	-	-	-	-	-	-	-	-	-	-	-
Admin Subtotal	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
PROGRAMS												
Northeast Corridor Grants to Amtrak	-	1,194,000	-	-	-	-	-	-	-	1,194,000	-	1,194,000
National Network Grants to Amtrak	-	3,184,000	-	-	-	-	-	-	-	3,184,000	-	3,184,000
Programs Subtotal	**-**	**4,378,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4,378,000**	**-**	**4,378,000**
TOTAL	**-**	**4,378,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4,378,000**	**-**	**4,378,000**

1/ FY 2022 and FY 2023 Administrative Expenses of $22 million per year are being transferred to the Financial Assistance Oversight and Technical Assistance account.

EXHIBIT II-5
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
FEDERAL RAILROAD ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Consolidated Rail Infrastructure and Safety Improvements	FY 2021 Enacted	FY 2022 CR	Baseline Changes: Annualization of Prior Pay Raises	Annualization of new FY 2022 FTE	FY 2023 Pay Raises	Adjustment for Compensable Days (260 days)	GSA Rent	WCF Increase/ Decrease	Inflation and other adjustments to base	FY 2023 Baseline Estimate	Program Increases/ Decreases	FY 2023 Request
PERSONNEL RESOURCES (FTE)												
Direct FTE	-	-	-	-	-	-	-	-	-	-	-	-
FINANCIAL RESOURCES												
ADMINISTRATIVE EXPENSES [1/]												
Salaries and Benefits	-	-	-	-	-	-	-	-	-	-	-	-
Benefits for Former Employees (AK RR)	-	-	-	-	-	-	-	-	-	-	-	-
Travel	150	150	-	-	-	-	-	-	-	150	(150)	-
Transportation	-	-	-	-	-	-	-	-	-	-	-	-
GSA Rent	-	-	-	-	-	-	-	-	-	-	-	-
Communications, & Utilities	-	-	-	-	-	-	-	-	-	-	-	-
Printing	-	-	-	-	-	-	-	-	-	-	-	-
Other Services:												
-WCF	-	-	-	-	-	-	-	-	-	-	-	-
-ESC	-	-	-	-	-	-	-	-	-	-	-	
-Other contracts	3,600	3,600	-	-	-	-	-	-	72	3,672	(3,672)	-
Supplies	-	-	-	-	-	-	-	-	-	-	-	-
Equipment	-	-	-	-	-	-	-	-	-	-	-	-
Insurance Claims & Settlements	-	-	-	-	-	-	-	-	-	-	-	-
Admin Subtotal	**3,750**	**3,750**	**-**	**-**	**-**	**-**	**-**	**-**	**72**	**3,822**	**(3,822)**	**-**
PROGRAMS												
Consolidated Rail Infrastructure and Safety Improvements	371,250	371,250	-	-	-	-	-	-	7,425	378,675	111,325	490,000
Programs Subtotal	**371,250**	**371,250**	**-**	**-**	**-**	**-**	**-**	**-**	**7,425**	**378,675**	**111,325**	**490,000**
TOTAL	**375,000**	**375,000**	**-**	**-**	**-**	**-**	**-**	**-**	**7,497**	**382,497**	**107,503**	**490,000**

1/ FY 2023 Administrative Expenses of $10 million are being transferred to the Financial Assistance Oversight and Technical Assistance account.

EXHIBIT II-5
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
FEDERAL RAILROAD ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Consolidated Rail Infrastructure and Safety Improvements (IIJA Supplemental)	FY 2021 Enacted	FY 2022 CR	Baseline Changes: Annualization of Prior Pay Raises	Annualization of new FY 2022 FTE	FY 2023 Pay Raises	Adjustment for Compensable Days (260 days)	GSA Rent	WCF Increase/ Decrease	Inflation and other adjustments to base	FY 2023 Baseline Estimate	Program Increases/ Decreases	FY 2023 Request
PERSONNEL RESOURCES (FTE)												
Direct FTE	-	-	-	-	-	-	-	-	-	-	-	-
FINANCIAL RESOURCES												
ADMINISTRATIVE EXPENSES [1/]												
Salaries and Benefits	-	-	-	-	-	-	-	-	-	-	-	-
Benefits for Former Employees (AK RR)	-	-	-	-	-	-	-	-	-	-	-	-
Travel	-	-	-	-	-	-	-	-	-	-	-	-
Transportation	-	-	-	-	-	-	-	-	-	-	-	-
GSA Rent	-	-	-	-	-	-	-	-	-	-	-	-
Communications, & Utilities	-	-	-	-	-	-	-	-	-	-	-	-
Printing	-	-	-	-	-	-	-	-	-	-	-	-
Other Services:												
-WCF	-	-	-	-	-	-	-	-	-	-	-	-
-ESC	-	-	-	-	-	-	-	-	-	-	-	
-Other contracts	-	-	-	-	-	-	-	-	-	-	-	-
Supplies	-	-	-	-	-	-	-	-	-	-	-	-
Equipment	-	-	-	-	-	-	-	-	-	-	-	-
Insurance Claims & Settlements	-	-	-	-	-	-	-	-	-	-	-	-
Admin Subtotal	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
PROGRAMS												
Consolidated Rail Infrastructure and Safety Improvements	-	980,000	-	-	-	-	-	-	-	980,000	-	980,000
Programs Subtotal	**-**	**980,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**980,000**	**-**	**980,000**
TOTAL	**-**	**980,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**980,000**	**-**	**980,000**

1/ FY 2022 and FY 2023 Administrative Expenses of $20 million per year are being transferred to the Financial Assistance Oversight and Technical Assistance account.

EXHIBIT II-5
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
FEDERAL RAILROAD ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Federal-State Partnership for Intercity Passenger Rail Grants	FY 2021 Enacted	FY 2022 CR	Baseline Changes: Annualization of Prior Pay Raises	Annualization of new FY 2022 FTE	FY 2023 Pay Raises	Adjustment for Compensable Days (260 days)	GSA Rent	WCF Increase/ Decrease	Inflation and other adjustments to base	FY 2023 Baseline Estimate	Program Increases/ Decreases	FY 2023 Request
PERSONNEL RESOURCES (FTE)												
Direct FTE	-	-	-	-	-	-	-	-	-	-	-	-
FINANCIAL RESOURCES												
ADMINISTRATIVE EXPENSES [1/]												
Salaries and Benefits	-	-	-	-	-	-	-	-	-	-	-	-
Benefits for Former Employees (AK RR)	-	-	-	-	-	-	-	-	-	-	-	-
Travel	40	40	-	-	-	-	-	-	-	40	(40)	-
Transportation	-	-	-	-	-	-	-	-	-	-	-	-
GSA Rent	-	-	-	-	-	-	-	-	-	-	-	-
Communications, & Utilities	-	-	-	-	-	-	-	-	-	-	-	-
Printing	-	-	-	-	-	-	-	-	-	-	-	-
Other Services:												
-WCF	-	-	-	-	-	-	-	-	-	-	-	-
-ESC	-	-	-	-	-	-	-	-	-	-	-	-
-Other contracts	1,960	1,960	-	-	-	-	-	-	39	1,999	(1,999)	-
Supplies	-	-	-	-	-	-	-	-	-	-	-	-
Equipment	-	-	-	-	-	-	-	-	-	-	-	-
Insurance Claims & Settlements	-	-	-	-	-	-	-	-	-	-	-	-
Admin Subtotal	**2,000**	**2,000**	**-**	**-**	**-**	**-**	**-**	**-**	**39**	**2,039**	**(2,039)**	**-**
PROGRAMS												
Federal-State Partnership for Intercity Passenger Rail Grants	198,000	198,000	-	-	-	-	-	-	3,960	201,960	341,940	543,900
Programs Subtotal	**198,000**	**198,000**	**-**	**-**	**-**	**-**	**-**	**-**	**3,960**	**201,960**	**341,940**	**543,900**
TOTAL	**200,000**	**200,000**	**-**	**-**	**-**	**-**	**-**	**-**	**3,999**	**203,999**	**339,901**	**543,900**

1/ FY 2023 Administrative Expenses of $11.1 million are being transferred to the Financial Assistance Oversight and Technical Assistance account.

EXHIBIT II-5
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
FEDERAL RAILROAD ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Federal-State Partnership for Intercity Passenger Rail Grants (IIJA Supplemental)	FY 2021 Enacted	FY 2022 CR	Baseline Changes: Annualization of Prior Pay Raises	Annualization of new FY 2022 FTE	FY 2023 Pay Raises	Adjustment for Compensable Days (260 days)	GSA Rent	WCF Increase/ Decrease	Inflation and other adjustments to base	FY 2023 Baseline Estimate	Program Increases/ Decreases	FY 2023 Request
PERSONNEL RESOURCES (FTE)												
Direct FTE	-	-	-	-	-	-	-	-	-	-	-	-
FINANCIAL RESOURCES												
ADMINISTRATIVE EXPENSES [1/]												
Salaries and Benefits	-	-	-	-	-	-	-	-	-	-	-	-
Benefits for Former Employees (AK RR)	-	-	-	-	-	-	-	-	-	-	-	-
Travel	-	-	-	-	-	-	-	-	-	-	-	-
Transportation	-	-	-	-	-	-	-	-	-	-	-	-
GSA Rent	-	-	-	-	-	-	-	-	-	-	-	-
Communications, & Utilities	-	-	-	-	-	-	-	-	-	-	-	-
Printing	-	-	-	-	-	-	-	-	-	-	-	-
Other Services:												
-WCF	-	-	-	-	-	-	-	-	-	-	-	-
-ESC	-	-	-	-	-	-	-	-	-	-	-	-
-Other contracts	-	-	-	-	-	-	-	-	-	-	-	-
Supplies	-	-	-	-	-	-	-	-	-	-	-	-
Equipment	-	-	-	-	-	-	-	-	-	-	-	-
Insurance Claims & Settlements	-	-	-	-	-	-	-	-	-	-	-	-
Admin Subtotal	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
PROGRAMS												
Federal-State Partnership for Intercity Passenger Rail Grants	-	7,056,000	-	-	-	-	-	-	-	7,056,000	-	7,056,000
Programs Subtotal	**-**	**7,056,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**7,056,000**	**-**	**7,056,000**
TOTAL	**-**	**7,056,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**7,056,000**	**-**	**7,056,000**

1/ FY 2022 and FY 2023 Administrative Expenses of $144 million per year are being transferred to the Financial Assistance Oversight and Technical Assistance account.

EXHIBIT II-5
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
FEDERAL RAILROAD ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Restoration and Enhancement Grants			Baseline Changes									
	FY 2021 Enacted	FY 2022 CR	Annualization of Prior Pay Raises	Annualization of new FY 2022 FTE	FY 2023 Pay Raises	Adjustment for Compensable Days (260 days)	GSA Rent	WCF Increase/ Decrease	Inflation and other adjustments to base	FY 2023 Baseline Estimate	Program Increases/ Decreases	FY 2023 Request
PERSONNEL RESOURCES (FTE)												
Direct FTE	-	-	-	-	-	-	-	-	-	-	-	-
FINANCIAL RESOURCES												
ADMINISTRATIVE EXPENSES [1/]												
Salaries and Benefits	-	-	-	-	-	-	-	-	-	-	-	-
Benefits for Former Employees (AK RR)	-	-	-	-	-	-	-	-	-	-	-	-
Travel	-	-	-	-	-	-	-	-	-	-	-	-
Transportation	-	-	-	-	-	-	-	-	-	-	-	-
GSA Rent	-	-	-	-	-	-	-	-	-	-	-	-
Communications, & Utilities	-	-	-	-	-	-	-	-	-	-	-	-
Printing	-	-	-	-	-	-	-	-	-	-	-	-
Other Services:												
-WCF	-	-	-	-	-	-	-	-	-	-	-	-
-ESC	-	-	-	-	-	-	-	-	-	-	-	-
-Other contracts	47	47	-	-	-	-	-	-	1	48	(48)	-
Supplies	-	-	-	-	-	-	-	-	-	-	-	-
Equipment	-	-	-	-	-	-	-	-	-	-	-	-
Insurance Claims & Settlements	-	-	-	-	-	-	-	-	-	-	-	-
Admin Subtotal	**47**	**47**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**48**	**(48)**	**-**
PROGRAMS												
Restoration and Enhancement Grants	4,673	4,673	-	-	-	-	-	-	93	4,766	44,734	49,500
Programs Subtotal	**4,673**	**4,673**	**-**	**-**	**-**	**-**	**-**	**-**	**93**	**4,766**	**44,734**	**49,500**
TOTAL	**4,720**	**4,720**	**-**	**-**	**-**	**-**	**-**	**-**	**94**	**4,814**	**44,686**	**49,500**

1/ FY 2023 Administrative Expenses of $0.5 million are being transferred to the Financial Assistance Oversight and Technical Assistance account.

EXHIBIT II-5
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
FEDERAL RAILROAD ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Railroad Crossing Elimination Program			Baseline Changes									
	FY 2021 Enacted	FY 2022 CR	Annualization of Prior Pay Raises	Annualization of new FY 2022 FTE	FY 2023 Pay Raises	Adjustment for Compensable Days (260 days)	GSA Rent	WCF Increase/ Decrease	Inflation and other adjustments to base	FY 2023 Baseline Estimate	Program Increases/ Decreases	FY 2023 Request
PERSONNEL RESOURCES (FTE)												
Direct FTE	-	-	-	-	-	-	-	-	-	-	-	-
FINANCIAL RESOURCES												
ADMINISTRATIVE EXPENSES [1/]												
Salaries and Benefits	-	-	-	-	-	-	-	-	-	-	-	-
Benefits for Former Employees (AK RR)	-	-	-	-	-	-	-	-	-	-	-	-
Travel	-	-	-	-	-	-	-	-	-	-	-	-
Transportation	-	-	-	-	-	-	-	-	-	-	-	-
GSA Rent	-	-	-	-	-	-	-	-	-	-	-	-
Communications, & Utilities	-	-	-	-	-	-	-	-	-	-	-	-
Printing	-	-	-	-	-	-	-	-	-	-	-	-
Other Services:												
-WCF	-	-	-	-	-	-	-	-	-	-	-	-
-ESC	-	-	-	-	-	-	-	-	-	-	-	-
-Other contracts	-	-	-	-	-	-	-	-	-	-	-	-
Supplies	-	-	-	-	-	-	-	-	-	-	-	-
Equipment	-	-	-	-	-	-	-	-	-	-	-	-
Insurance Claims & Settlements	-	-	-	-	-	-	-	-	-	-	-	-
Admin Subtotal	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
PROGRAMS												
Railroad Crossing Elimination Program	-	-	-	-	-	-	-	-	-	-	240,100	240,100
Programs Subtotal	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**240,100**	**240,100**
TOTAL	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**240,100**	**240,100**

1/ FY 2023 Administrative Expenses of $4.9 million are being transferred to the Financial Assistance Oversight and Technical Assistance account.

EXHIBIT II-5
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
FEDERAL RAILROAD ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Railroad Crossing Elimination Program (IIJA Supplemental)	FY 2021 Enacted	FY 2022 CR	Baseline Changes: Annualization of Prior Pay Raises	Annualization of new FY 2022 FTE	FY 2023 Pay Raises	Adjustment for Compensable Days (260 days)	GSA Rent	WCF Increase/ Decrease	Inflation and other adjustments to base	FY 2023 Baseline Estimate	Program Increases/ Decreases	FY 2023 Request
PERSONNEL RESOURCES (FTE)												
Direct FTE	-	-	-	-	-	-	-	-	-	-	-	-
FINANCIAL RESOURCES												
ADMINISTRATIVE EXPENSES [1/]												
Salaries and Benefits	-	-	-	-	-	-	-	-	-	-	-	-
Benefits for Former Employees (AK RR)	-	-	-	-	-	-	-	-	-	-	-	-
Travel	-	-	-	-	-	-	-	-	-	-	-	-
Transportation	-	-	-	-	-	-	-	-	-	-	-	-
GSA Rent	-	-	-	-	-	-	-	-	-	-	-	-
Communications, & Utilities	-	-	-	-	-	-	-	-	-	-	-	-
Printing	-	-	-	-	-	-	-	-	-	-	-	-
Other Services:												
-WCF	-	-	-	-	-	-	-	-	-	-	-	-
-ESC	-	-	-	-	-	-	-	-	-	-	-	-
-Other contracts	-	-	-	-	-	-	-	-	-	-	-	-
Supplies	-	-	-	-	-	-	-	-	-	-	-	-
Equipment	-	-	-	-	-	-	-	-	-	-	-	-
Insurance Claims & Settlements	-	-	-	-	-	-	-	-	-	-	-	-
Admin Subtotal	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
PROGRAMS												
Railroad Crossing Elimination Program	-	588,000	-	-	-	-	-	-	-	588,000	-	588,000
Programs Subtotal	**-**	**588,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**588,000**	**-**	**588,000**
TOTAL	**-**	**588,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**588,000**	**-**	**588,000**

1/ FY 2022 and FY 2023 Administrative Expenses of $12 million per year are being transferred to the Financial Assistance Oversight and Technical Assistance account.

EXHIBIT II-5
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
FEDERAL RAILROAD ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Financial Assistance Oversight and Technical Assistance	FY 2021 Enacted	FY 2022 CR	Baseline Changes: Annualization of Prior Pay Raises	Annualization of new FY 2022 FTE	FY 2023 Pay Raises	Adjustment for Compensable Days (260 days)	GSA Rent	WCF Increase/ Decrease	Inflation and other adjustments to base	FY 2023 Baseline Estimate	Program Increases/ Decreases	FY 2023 Request
PERSONNEL RESOURCES (FTE)												
Direct FTE	-	-	-	-	-	-	-	-	-	-	-	-
FINANCIAL RESOURCES												
ADMINISTRATIVE EXPENSES												
Salaries and Benefits	-	-	-	-	-	-	-	-	-	-	-	-
Benefits for Former Employees (AK RR)	-	-	-	-	-	-	-	-	-	-	-	-
Travel	-	-	-	-	-	-	-	-	-	-	685	685
Transportation	-	-	-	-	-	-	-	-	-	-	-	-
GSA Rent	-	-	-	-	-	-	-	-	-	-	-	-
Communications, & Utilities	-	-	-	-	-	-	-	-	-	-	-	-
Printing	-	-	-	-	-	-	-	-	-	-	-	-
Other Services:												
-WCF	-	-	-	-	-	-	-	-	-	-	-	-
-ESC	-	-	-	-	-	-	-	-	-	-	-	-
-Other contracts	-	-	-	-	-	-	-	-	-	-	40,815	40,815
Supplies	-	-	-	-	-	-	-	-	-	-	-	-
Equipment	-	-	-	-	-	-	-	-	-	-	-	-
Insurance Claims & Settlements	-	-	-	-	-	-	-	-	-	-	-	-
Admin Subtotal	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**41,500**	**41,500**
PROGRAMS												
none	-	-	-	-	-	-	-	-	-	-	-	-
Programs Subtotal	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
TOTAL [1/]	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**41,500**	**41,500**

1/ This account's resources are transfers from the following accounts - Amtrak Northeast Corridor, Amtrak National Network, Consolidated Rail Infrastructure and Safety Improvements, Federal-State Partnership for Intercity Passenger Rail, Restoration and Enhancement Grants, and Railroad Crossing Elimination Program.

EXHIBIT II-5
SUMMARY OF REQUESTED FUNDING CHANGES FROM BASE
FEDERAL RAILROAD ADMINISTRATION
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

Financial Assistance Oversight and Technical Assistance (IIJA Supplemental)	FY 2021 Enacted	FY 2022 CR	Baseline Changes: Annualization of Prior Pay Raises	Annualization of new FY 2022 FTE	FY 2023 Pay Raises	Adjustment for Compensable Days (260 days)	GSA Rent	WCF Increase/ Decrease	Inflation and other adjustments to base	FY 2023 Baseline Estimate	Program Increases/ Decreases	FY 2023 Request
PERSONNEL RESOURCES (FTE)												
Direct FTE	-	24	-	-	-	-	-	-	-	24	67	91
FINANCIAL RESOURCES												
ADMINISTRATIVE EXPENSES												
Salaries and Benefits	-	4,406	11	-	152	(18)	-	-	-	4,551	12,706	17,258
Benefits for Former Employees (AK RR)	-	-	-	-	-	-	-	-	-	-	-	-
Travel	-	50	-	-	-	-	-	-	-	50	100	150
Transportation	-	-	-	-	-	-	-	-	-	-	-	-
GSA Rent	-	-	-	-	-	-	-	-	-	-	-	-
Communications, & Utilities	-	-	-	-	-	-	-	-	-	-	-	-
Printing	-	-	-	-	-	-	-	-	-	-	-	-
Other Services:												
-WCF	-	-	-	-	-	-	-	-	-	-	-	-
-ESC	-	-	-	-	-	-	-	-	-	-	-	-
-Other contracts [2/]	-	190,544	-	-	-	-	-	-	-	190,544	(12,952)	177,592
Supplies	-	-	-	-	-	-	-	-	-	-	-	-
Equipment	-	3,000	-	-	-	-	-	-	-	3,000	-	3,000
Insurance Claims & Settlements	-	-	-	-	-	-	-	-	-	-	-	-
Admin Subtotal	**-**	**198,000**	**11**	**-**	**152**	**(18)**	**-**	**-**	**-**	**198,146**	**(146)**	**198,000**
PROGRAMS												
none	-	-	-	-	-	-	-	-	-	-	-	-
Programs Subtotal	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Transfer to Department of Transportation's Office of Inspector General	**-**	**(495)**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**(495)**	**-**	**(495)**
Transfer to Amtrak's Office of Inspector General	**-**	**(495)**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**(495)**	**-**	**(495)**
TOTAL [1/]	**-**	**197,010**	**11**	**-**	**152**	**(18)**	**-**	**-**	**-**	**197,156**	**(146)**	**197,010**

1/ This account's supplemental resources are transfers from the following accounts - Amtrak Northeast Corridor, Amtrak National Network, Consolidated Rail Infrastructure and Safety Improvements, Federal-State Partnership for Intercity Passenger Rail, and Railroad Crossing Elimination Program.

2/ Other contracts resources will be used for both contracts and future Salaries and Benefits costs.

EXHIBIT II-6
WORKING CAPITAL FUND
FEDERAL RAILROAD ADMINISTRATION
($000)

	FY 2021 ENACTED	FY 2022 CR	FY 2023 PRES. BUD.
DIRECT:			
Safety and Operations	$ 19,093	$ 22,158	$ 23,468
SUBTOTAL	$ 19,093	$ 22,158	$ 23,468
TOTAL	$ 19,093	$ 22,158	$ 23,468

EXHIBIT II-7
FEDERAL RAILROAD ADMINISTRATION
PERSONNEL RESOURCE -- SUMMARY
TOTAL FULL-TIME EQUIVALENTS

	FY 2021 ACTUAL	FY 2022 CR	FY 2023 PRES. BUD.
DIRECT FUNDED BY APPROPRIATION			
Safety and Operations	857	856	915
National Network Grants to Amtrak	15	13	0
SUBTOTAL, DIRECT FUNDED	872	869	915
BASE TOTAL FTEs	**872**	**869**	**915**
SUPPLEMENTAL FUNDED FTE's			
IIJA Supplemental Funding			
Financial Assistance Oversight and Technical Assistance	0	24	91
SUBTOTAL, Supplemental Funded	0	24	91
TOTAL FTEs	**872**	**893**	**1,006**

Notes:
-- FY 2021 Enacted column represents actual FTEs based on the SF-113G.

EXHIBIT II-8
FEDERAL RAILROAD ADMINISTRATION
RESOURCE SUMMARY – STAFFING
FULL-TIME PERMANENT POSITIONS

	FY 2021 ACTUAL	FY 2022 CR	FY 2023 PRES. BUD.
DIRECT FUNDED BY APPROPRIATION			
Safety and Operations	860	886	944
National Network Grants to Amtrak	14	14	0
SUBTOTAL, DIRECT FUNDED	875	900	944
BASE TOTAL POSITIONS	**875**	**900**	**944**
SUPPLEMENTAL FUNDED FTP's			
IIJA Supplemental Funding			
Financial Assistance Oversight and Technical Assistance	0	59	122
SUBTOTAL, Supplemental Funded	0	59	122
TOTAL POSITIONS	**875**	**959**	**1,066**

Notes:
-- FY 2021 Enacted column represents on-board positions at the end of FY 2021

EXHIBIT II-9
HISTORY OF APPROPRIATIONS, FY 2013 - 2022
FEDERAL RAILROAD ADMINISTRATION
($000)

Account	FY 2013 [1/]	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020 [7/]	FY 2021 [9/]	FY 2022 [11/]
Safety and Operations	169,254	184,500	186,870	199,000	218,298	221,698	221,698	224,448	234,905	234,905
Safety and Operations	--	--	--	(6,710) [4/]	--	--	--	--	--	--
Railroad Research and Development	33,169	35,250	39,100	39,100	40,100	40,600	40,600	40,600	41,000	41,000
Railroad Research and Development	--	--	--	(1,960) [4/]	--	--	--	--	--	--
Rail Line Relocation and Improvement Program	--	--	--	(2,241) [4/]	--	--	--	--	(12,650) [10/]	(2,711)
Railroad Safety Grants	--	--	10,000	50,000	--	--	--	--	--	--
Railroad Safety Technology Program	--	--	--	--	--	--	--	--	(613) [10/]	--
Consolidated Rail Infrastructure and Safety Improvements	--	--	--	--	68,000	592,547	255,000	325,000	375,000	1,355,000
Federal-State Partnership for State of Good Repair	--	--	--	--	25,000	250,000	400,000	200,000	200,000	7,256,000
Restoration and Enhancement Grants	--	--	--	--	5,000	20,000	5,000	2,000	4,720	4,720
Railroad Crossing Elimination Program	--	--	--	--	--	--	--	--	--	588,000
Financial Assistance Oversight and Technical Assistance	--	--	--	--	--	--	--	--	--	197,010
Passenger Rail Improvement, Modernization, and Enhancement Grants	--	--	--	--	--	--	--	--	--	--
Northeast Corridor Grants to the National Railroad Passenger Corporation	--	--	--	--	328,000	650,000	650,000	1,192,000	2,325,819	1,894,000
National Network Grants to the National Railroad Passenger Corporation	--	--	--	--	1,167,000	1,291,600	1,291,600	1,826,000	2,374,181	4,484,000
Operating Grants to the National Railroad Passenger Corporation	441,625	340,000	250,000	288,500	--	--	--	--	--	--
Capital and Debt Service Grants to the National Railroad Passenger Corporation	902,205	1,050,000	1,140,000	1,101,500	--	--	--	--	--	--
Capital and Debt Service Grants to the National Railroad Passenger Corporation	--	--	--	(5,000) [4/]	--	--	--	--	(10,458) [10/]	--
Grants to the National Railroad Passenger Corporation	297,100 [2/]	--	--	(267) [4/]	13,480 [6/]	--	--	--	--	--
Pennsylvania Station Redevelopment Project	--	--	--	40,200 [5/]	--	--	--	--	--	--
Next Generation High-Speed Rail	--	(1,973) [3/]	--	(4,945) [4/]	--	--	--	--	(3,035) [10/]	(0)
Northeast Corridor Improvement Program	--	(4,419) [3/]	--	19,163 [4/]	--	--	--	--	--	--
Intercity Passenger Rail Grant Program	--	--	--	--	--	--	--	--	(10,165) [10/]	--
Magnetic Levitation Technology Deployment Program	--	--	--	--	--	--	10,000	2,000	2,000	2,000
Railroad Rehabilitation and Improvement Financing Program (discretionary)	--	--	--	1,960 [4/]	--	25,000	17,000	-- [8/]	--	--
Railroad Rehabilitation and Improvement Financing Program (mandatory)	33,445	43,845	31,455	563	1,809	100,371	60,811	-- [8/]	--	--
Total FRA Budget Authority	**1,876,798**	**1,647,203**	**1,657,425**	**1,718,863**	**1,866,687**	**3,191,816**	**2,951,709**	**3,812,048**	**5,520,704**	**16,053,924**

Notes:

1/ FY 2013 figures reflect 0.2% rescission and sequestered amounts excluded.

2/ The Disaster Relief Appropriations Act of FY 2013 (P.L. 113-2) provided funds to Amtrak for Hurricane Sandy, including $32 million for repair work and $86 million for disaster mitigation projects, less sequestration. Also in FY 2013, $185 million was transferred from FTA to FRA for the Hudson Yards Project.

3/ FY 2014 Omnibus (P.L. 113-76) reflects rescissions on prior year unobligated balances of $4.419M from the Northeast Corridor Improvement Program and $1.973M from the Next Generation High-Speed Rail.

4/ FY 2016 Omnibus (P.L. 114-113) reflects the following rescissions from prior year unobligated balances: $6,710,477 from Safety & Operations, $1,960,000 from Railroad Research and Development, $2,241,385 from Rail Line Relocation and Improvement, $5,000,000 from Capital and Debt Service Grants to the National Railroad Passenger Corporation (NEC 2015), $267,019 from Grants to the National Railroad Passenger Corporation, and $4,944,504 from Next Generation High-Speed Rail. These amounts were then reallocated to: $19,163,385 for Northeast Corridor Improvement Program and $1,960,000 to Railroad Rehabilitation and Improvement Financing Program.

5/ In FY 2016, $40.2M from the Disaster Relief Appropriations Act of FY 2013 (P.L. 113-2) was transferred from FTA to FRA for risk reduction projects at Pennsylvania Station, which was an area impacted by Hurricane Sandy.

6/ In FY 2017, $13.48M from the Disaster Relief Appropriations Act of FY 2013 (P.L. 113-2) was transferred from FTA to FRA for the MTA/LIRR River to River Rail Resilience project, which was an area impacted by Hurricane Sandy.

7/ FY 2020 amounts are the Enacted Budget plus supplemental funds. The CARES Act (COVID-19) provided $0.25M to Safety & Operations, $492M to Northeast Corridor Grants to Amtrak, and $526M to National Network Grants to Amtrak.

8/ In FY 2020, the Railroad Rehabilitation and Improvement Financing Program accounts moved to the Office of the Secretary.

9/ FY 2021 amounts are the Enacted Budget plus COVID-19 supplemental funds. Supplemental funds from the Coronavirus Response and Relief Supplemental Appropriations (CRRSA) Act include $655,431,000 for Northeast Corridor Grants to Amtrak and $344,569,000 to National Network Grants to Amtrak. Supplemental funds from the American Rescue Plan (ARP) Act include $970,388,160 for Northeast Corridor Grants to Amtrak and $729,611,840 to National Network Grants to Amtrak.

10/ The Consolidated Appropriations Act, 2021 (P.L. 116-260) includes the following rescissions of prior year unobligated balances: $10,458,135.54 from Capital and Debt Service Grants to the National Railroad Passenger Corporation, $613,252.29 from Rail Safety Technology Program, $10,164,8855.13 from Intercity Passenger Rail Grant Program, $16,650,365.14 from Rail Line Relocation and Improvement, and $3,034,848.52 from Next Generation High-Speed Rail.

11/ The FY 2022 column assumes a full-year Continuing Resolution including rescissions of $2,711,124.16 for Rail Line Relocation and Improvement and $94.94 for Next Generation High-Speed Rail.. Additionally, this column includes supplemental funds from the Infrastructure Investment and Jobs Act (IIJA) of: $1.2B ($1.194B net transfer) for Amtrak Northeast Corridor, $3.2B ($3.184B net transfer) for Amtrak National Network, $1.0B ($0.98B net transfer) for Consolidated Rail Infrastructure and Safety Improvements, $7.2B ($7.056B net transfer) for Federal-State Partnership for Intercity Passenger Rail, $0.6B ($0.588B net transfer) for Railroad Crossing Elimination, and $0 ($0.19701B net transfer) for Financial Assistance Oversight and Technical Assistance.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

SAFETY AND OPERATIONS
APPROPRIATIONS LANGUAGE

SAFETY AND OPERATIONS

For necessary expenses of the Federal Railroad Administration, not otherwise provided for, [$247,700,000]*$254,426,000*, of which $25,000,000 shall remain available until expended[: Provided, That of the amounts provided under this heading, up to $2,100,000 shall be available for the alteration and repair of buildings and improvements for fire and life safety, emergency power system, waste and potable water management, and asbestos abatement projects, to carry out necessary railroad safety, training, and research activities at the Transportation Technology Center].

Explanation of Changes: Funding requested last year in the FY 2022 President's Budget for repairs and improvements at FRA's Transportation Technology Center have been shifted under FRA's Research and Development account in the FY 2023 President's Budget to reflect the new authorization of appropriations for these activities contained in the Infrastructure Investment and Jobs Act.

EXHIBIT III-1
SAFETY AND OPERATIONS
Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2021 ENACTED	FY 2022 CR	FY 2023 PRES. BUD.
Safety and Operations	$ 234,905	$ 234,905	$ 254,426
TOTAL	$ 234,905	$ 234,905	$ 254,426
FTEs			
Direct Funded	857	856	915

Program and Performance Statement

Funds requested in the Safety and Operations account support the Federal Railroad Administration's (FRA) personnel and administrative expenses, the cost of railroad safety inspectors, and other program activities, including contracts. Resources are also provided to fund critical railroad safety programs, information management, technology, and safety education and outreach.

EXHIBIT III-1a
FEDERAL RAILROAD ADMINISTRATION
SAFETY AND OPERATIONS
SUMMARY ANALYSIS OF CHANGE FROM FY 2022 TO FY 2023
Appropriations, Obligations, Limitations, and Exempt Obligations
($000)

	$000	**FTE**
FY 2022 CR	$234,905	856
ADJUSTMENTS TO BASE:		
Annualization of Prior Pay Raise(s)	363	
Annualization of FY 2022 FTEs	0	
FY 2023 Pay Raise	5,024	
Adjustment for Compensable Days	-577	
GSA Rent	913	
Working Capital Fund	1,311	
Inflation and Other	622	
SUBTOTAL, ADJUSTMENTS TO BASE	**7,656**	**0**
PROGRAM REDUCTIONS		
Printing	-10	
Other contracts	-176	
Equipment	-600	
Insurance Claims & Settlements	-200	
Rail Grade Crossing Safety	-150	
Drug and Alcohol Program	-269	
Audit Management	-25	
Trespass Prevention	-1,900	
SUBTOTAL, PROGRAM REDUCTIONS	**-3,330**	**0**
PROGRAM INCREASES		
Salaries and Benefits	10,426	59
Travel	604	
Transportation	15	
Communications & Utilities	63	
Supplies	53	

	$000		FTE
Rail Safety Partnership	1,240		
Rail Safety Information System (RSIS)	12		
Positive Train Control (PTC) Support	490		
Rail Safety Advisory Committee (RSAC)	100		
Technical Training Standards Division	438		
Other Safety Grants	293		
Grant & Project Development Technical Assistance and Oversight	1,461		
SUBTOTAL, PROGRAM INCREASES	**15,194**		**59**
FY 2023 REQUEST	**254,426**		**915**

Detailed Justification for Railroad Safety and Operations

FY 2023 – Railroad Safety and Operations – Budget Request ($000)

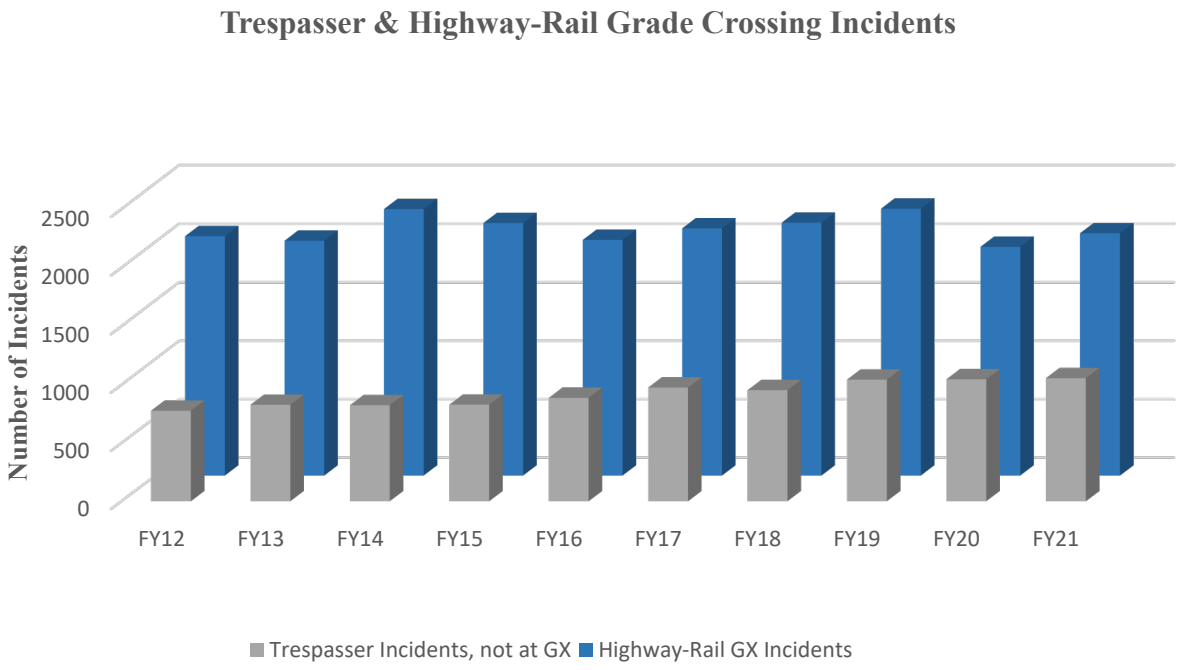
Program Activity	FY 2021 Enacted	FY 2022 Continuing Resolution	FY 2023 President's Budget
Safety and Operations	$234,905	$234,905	$254,426
Total	**$234,905**	**$234,905**	**$254,426**
FTE	**857**	**856**	**915**

What is this program and what does this funding level support?

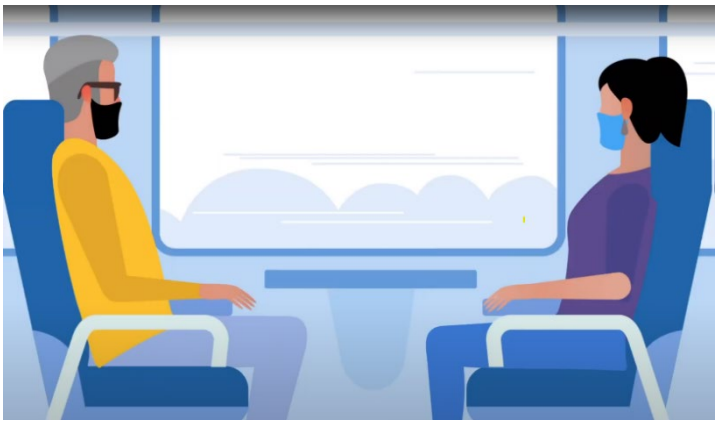
The appropriation for the Safety and Operations (S&O) account funds many of FRA's programs to improve railroad safety. It also funds FRA's organizational infrastructure—payroll, rent, telecommunications, information technology, and contract support—that enables the agency to achieve its safety and infrastructure development goals.

FRA oversees, regulates, and enforces the safety of railroad operations nationwide. In addition, FRA supports the development of intercity passenger rail and freight rail services and new technologies and practices to improve railroad safety and efficiency. S&O funding is the foundation for FRA to carry out its mission of enabling the safe, reliable, and efficient movement of people and goods for a strong America, now and in the future.

Over the last 40 years, the rail industry has made significant strides to improve safety, with the rate of rail-related accidents and incidents having fallen by 82 percent over that time. This improvement is due in large part to the railroad industry's dedicated and highly-skilled workforce who live and breathe safety each day on the job, as well as the development and adoption of new technologies and practices and FRA's safety enforcement and technical assistance regime. While the industry continues to drive safety improvements, the rate of improvement has generally slowed over the last decade and not all areas of rail safety are trending in a positive direction. In particular, the number of grade crossing and trespassing incidents have increased over the last decade, by 1 percent and 35 percent, respectively, despite suppressed motor vehicle and train traffic levels in 2020 due to COVID-19. In response to the increases in grade crossing and trespassing incidents, FRA's budget request directs more resources towards curbing these troubling trends across the S&O, R&D, and competitive grant accounts, including the newly authorized Railroad Crossing Elimination program.



FRA's S&O account also supports many of the agency's actions to advance the Biden-Harris Administration's comprehensive response to COVID-19. FRA maintained its level of safety enforcement activities throughout the pandemic, relative to previous years, and continues to explore all options to protect rail passengers and workers, provide economic and administrative relief to agency stakeholders, and maintain the highest levels of safety for our nation's essential passenger and freight rail services. FRA actions include:



- Issuing an Emergency Order to implement Executive Order 13998 "Promoting COVID-19 Safety in Travel" to require the use of face masks in railroad operations.[1]
- Granting emergency waivers from certain FRA regulatory requirements, primarily to maintain social distancing protocols.
- Providing relief and flexibility for certain grant application and administration requirements, such as extending grant application deadlines, providing no-cost extensions to grant periods of performance, and allowing additional time for grantees to submit single audits to the Federal Audit Clearinghouse.

[1] Federal Railroad Administration, Emergency Order Requiring Face Mask Use in Railroad Operations, 86 Fed. Reg. 11888, March 1, 2021.

- Assisting with the distribution of face masks to railroad operators to safeguard the health of railroad workers and passengers.
- Purchasing additional safety and personal protective equipment to safeguard the health of FRA personnel.
- Tracking industry trends including COVID cases in the industry, waiver usage metrics, and railroad performance.
- Expeditiously awarding and administering over $3.7 billion in COVID relief funds for Amtrak.

Organizational Realignment

FRA intends to modify its organizational structure in order to effectively deliver the expanded investment responsibilities provided under the Infrastructure Investment and Jobs Act (IIJA) and to better reflect the agency's dual missions of railroad safety and railroad development. The proposed realignment includes: (1) concentrating the focus of the existing Office of Railroad Policy and Development (renamed the Office of Railroad Development) on investment and development programs, and expanding the office to be consistent with other major grant-making agencies; and (2) establishing a new Office of Research, Data, and Innovation to consolidate analytical support functions currently housed across the agency.

- **The Office of Railroad Policy and Development will be renamed the Office of Railroad Development.** The restructured office will focus efforts on FRA's expanded grant-making and railroad development mission, as authorized by IIJA. These activities include administration and oversight of competitive grant programs and Amtrak funding—which include more than $13 billion per year in supplemental advance appropriations through FY 2026, plus additional annual appropriations—as well as new technical assistance programs to help guide the development of intercity passenger rail corridors across the country, among other responsibilities.

  These IIJA responsibilities require FRA to broaden and enhance its capabilities across the full spectrum of project development, delivery, oversight, and technical assistance disciplines. FRA intends to dedicate new personnel and resources on activities including: railroad planning, operations, and engineering technical support for freight and intercity passenger rail projects across the country; oversight of Northeast Corridor project implementation and Amtrak's service lines, asset lines, and capital programs (including financial performance); compliance with environmental laws and regulations, and better integration of technical railroad project development with environmental work; and greater stakeholder outreach and coordination to achieve implementation of multi-state compacts and corridor network plans, projects, and programs.

- **The new Office of Research, Data, and Innovation** will combine and better integrate, within a single office, FRA's research; railroad industry economic analysis; railroad data analytics and geographic information system capabilities; international rail program coordination; and railroad industry training and workforce development activities. This new office will increase operating efficiency by consolidating related functions that are

currently located in the Office of Railroad Safety and Office of Railroad Policy and Development.

The following sections describe FRA's FY 2023 major cost categories for S&O.

Mission Support and Fixed Costs
FY 2021 Enacted: $201.47 million
FY 2022 Continuing Resolution: $201.25 million
FY 2023 President's Budget: $218.87 million

More than 85 percent of S&O funding covers salaries and benefits, travel and motor vehicle fleet, and other operating infrastructure costs, such as rent. FRA executes its railroad safety responsibilities through a diverse and highly skilled staff. FRA's field presence is composed of more than 500 employees who directly interact with railroads and other stakeholders. These individuals include approximately 350 railroad safety inspectors covering six safety disciplines: operating practices, motive power and equipment, signal and train control, track, hazardous materials, and grade crossing safety. In addition to the inspector workforce, FRA employs more than 100 field-based specialists, engineers, analysts, and managers with expertise in areas such as PTC, passenger rail, human performance, alcohol and drug programs, tank car quality assurance, rail and infrastructure integrity, bridge safety, occupational health, radioactive materials, and railroad management. FRA headquarters staff includes technical experts who manage the mission critical programs, provide technical oversight and management of field personnel, and support development of safety standards and regulations.

In addition to FRA's field-based specialists and inspectors, FRA's Office of Railroad Safety includes nine Safety Management Teams (SMT) located across the country. The SMTs are responsible for oversight and engagement with a single railroad or a class of railroads to monitor risks on a system level by becoming familiar with the infrastructure, rolling stock, work force, and operations, with the goal to collaboratively identify and address persistent and emerging potential safety issues.

FRA Safety Management Teams

Team	Location	Assigned Railroad(s)
SMT-1	Cambridge, MA	Amtrak and Commuters, East
SMT-2	Wilmington, DE	Short Lines, East
SMT-3	Atlanta, GA	Norfolk Southern
SMT-4	Chicago, IL	Canadian Pacific Railway, Canadian National Railway, Chicago Commuter District
SMT-5	Fort Worth, TX	BNSF Railway
SMT-6	Kansas City, MO	Union Pacific Railroad and Kansas City Southern
SMT-7	Sacramento, CA	Commuters, West
SMT-8	Vancouver, WA	Short Lines, West
SMT-9	Jacksonville, FL	CSX

FRA's remaining S&O-funded personnel are in the Offices of Railroad Development; Research, Data, and Innovation: Chief Counsel; Chief Financial Officer; Administration; and the Administrator. These personnel include planners, project development and delivery specialists, engineers, economists, attorneys, budget and financial analysts, human resources specialists, public and government affairs specialists, and other professionals.

FRA's staff is integral to achieving the ambitious transportation agenda facing the Department. As expressed in the FY 2022 President's Budget, FRA was seeking to increase staffing levels to effectively manage its portfolio of safety initiatives and investment programs prior to the passage of IIJA. The increased responsibilities set forth under IIJA only reinforce FRA's need to hire additional employees to support new and existing programs. While the majority of IIJA-related staffing growth will be funded from the administrative takedowns provided by the IIJA grant programs, S&O-funded personnel must also increase to ensure existing programs, new IIJA mandates, and support functions are adequately resourced.

- **Equity Focus:** In addition to increasing staffing among traditional safety and project development functions, FRA is planning to more than double the size of its Office of Civil Rights to support the Biden-Harris Administration's Equity goals. These additional resources will enable FRA to improve enforcement of Title VI and small business contracting requirements under FRA grant programs, as well as support the study of disparate treatment and the prorogation of programs to address any disparate treatment found.

- **Climate Focus:** FRA staff are also actively working to combat the climate crisis. In addition to generally supporting rail development initiatives—which represent a more energy-efficient and climate-friendly mode of transportation—FRA staff are ensuring FRA-funded projects and other agency actions properly account for their environmental impacts under the National Environmental Policy Act (NEPA) and other related laws, conducting research and testing to advance the use of clean fuels and clean energy propulsion systems in railroad operations, and developing regulations, guidance, and policies that will lead to reductions in greenhouse gas emissions and adoption of climate change resiliency principles. More than 30 environmental protection specialists, attorneys, engineers, and analysts directly work on these activities as one of their core responsibilities, and more staff will be hired as part of the $66 billion in infrastructure investment funding provided through the IIJA Supplemental.

Automated Track Inspection Program
FY 2021 Enacted: $16.50 million
FY 2022 Continuing Resolution: $16.50 million
FY 2023 President's Budget: $16.50 million

Defective track is one of the most frequent causes of derailments. Identifying track defects and other precursor conditions is the primary focus of FRA's Automated Track Inspection Program (ATIP). FRA deploys its fleet of ATIP vehicles to collect data on the highest risk routes, including passenger and hazardous materials routes. FRA then uses the data to inform oversight and enforcement activities, development of regulations, audits of railroad compliance with Federal Track Safety Standards, and assessments of the state-of-repair of U.S. railroads. FRA shares the infrastructure diagnostics with the track owners and notifies railroads of major safety risks. Additionally, ATIP supports FRA's railroad safety research program. During ATIP operations, FRA evaluates new technologies to improve track evaluation and other safety benefits. In FY 2021, FRA's ATIP inspection vehicles collected track measurement data for over 147,000 miles of track, finding 7,835 exceptions to FRA's Track Safety Standards, of which 25 percent were deemed safety-critical. Over the last 5 years of ATIP operations, the number of track geometry-caused accidents has decreased by 29 percent. The ATIP program, by finding and reporting exception information to the railroads, has contributed to this improvement.

Additionally, in FY 2022, FRA will introduce a second hi-rail vehicle to the ATIP fleet. While FRA's first hi-rail vehicle is deployed to make track geometry measurements like the other ATIP vehicles, this second hi-rail vehicle is used to perform rail integrity inspections. Specifically, this vehicle uses ultrasonic technology to identify internal rail flaws, which cannot be readily detected by track geometry technology or visual inspections.

FRA will use FY 2023 funding to support a fleet of 10 vehicles, continue to validate the railroads' inspection programs, and when needed, use ATIP funding to advance research priorities, conduct routine compliance checks of railroad inspections, and to accelerate deferred maintenance activities.

Positive Train Control
FY 2021 Enacted: $0.50 million[2]
FY 2022 Continuing Resolution: $0.50 million
FY 2023 President's Budget: $1.00 million

On December 29, 2020, FRA announced that PTC technology was in operation on all 57,536 required freight and passenger railroad route miles, prior to the December 31, 2020 statutory deadline set by Congress. FRA continues to monitor and inspect railroad's safe operation and proper maintenance of PTC systems and enforce compliance with each railroad's PTC safety plan, as well as applicable statutes and regulations (including assessing penalties). IIJA also now requires host railroads to report on the status of PTC performance quarterly to FRA. FRA also provides technical oversight and approval of all material changes to PTC systems and related hardware and software, as well as oversight and technical assistance to any new start passenger railroads, any railroad that is required to be PTC-equipped due to changes in traffic or poisonous- or toxic-by-inhalation hazardous (PIH/TIH) traffic levels, and any Class II/Class III railroads subject to the December 31, 2023 deadline to PTC-equip certain locomotives.

PTC funding will be used for contractors that provide FRA with direct project and data management support, along with subject matter experts to review the material modifications of PTC systems. Railroads have indicated that software updates and changes are anticipated twice a year for each PTC system. These requests for amendments of PTC Safety Plans will require FRA review and approval. Also in FY 2023, FRA will be evaluating Implementation and Safety Plans from Class II/III railroads and tracking progress as the December 31, 2023 compliance deadline approaches.

Rail Safety Partnerships
FY 2021 Enacted: up to $3.00 million
FY 2022 Continuing Resolution: $3.00 million
FY 2023 President's Budget: $4.30 million

Confidential Close Call Reporting System (C^3RS)
The C^3RS program enables railroad employees to report close calls and unsafe events and conditions in a safe environment. Employees who report a close-call event receive protection from railroad discipline and FRA enforcement. Railroads also receive protection from FRA enforcement for events reported within C^3RS. However, a close call does not involve willful, reckless, or criminal acts, nor does it involve any FRA-reportable accident resulting in harm to a person or property. Events that involve alcohol or drug impairment or are witnessed in real-time by FRA personnel or a railroad manager or supervisor, are not close calls. In addition, any incident resulting in a release of hazardous material is not a close-call event. Analyzing close calls is a proactive way to manage safety. When individual events are

[2] The FY 2021 enacted bill provided up to $3.00 million for Positive Train Control.

analyzed collectively through root cause analysis, railroads can identify safety hazards and develop solutions to mitigate or eliminate threats.

As with previous years' funding, FRA will use the FY 2023 funds to pay for third-party processing and de-identifying of close-call reports from safety-related railroad employees. The National Aeronautics and Space Administration (NASA) provides this service for FRA (and the Federal Aviation Administration). NASA supports FRA in achieving the highest level of close-call report processing.

FRA has worked diligently with industry to grow the C^{3}RS program. At the end of 2018, eight railroads were participating in C^{3}RS. As of February 2022, 21 passenger, commuter, and Class II/III freight railroads—representing nearly 26,000 safety-related railroad employees—were participating. As the C^{3}RS program continues to grow, FRA strives to maintain the highest level of processing to ensure the Peer Review Teams have the high-quality, reliable data necessary to develop mitigation proposals.

In 2021, NASA and FRA rolled out the Data Base Query Tool (DBQT). DBQT is the nation's largest repository of voluntarily-submitted railroad safety reports, and currently contains over 14,000 de-identified incident reports. These reports can help improve safety and inform policy development, human factors research, education, training, and more. All data is owned and housed by NASA, where the aviation industry has benefited from an analogous database called Data Base Online since 2006.

In FY 2023, FRA intends to target Class I freight railroad participation in a modified version of C^{3}RS by encouraging Class I railroad employees to report close calls to NASA. Class I railroads represent 90 percent of industry employees, however, no Class I railroad currently participates in the C^{3}RS program. Under this proposal, no Implementing Memorandum of Understanding (IMOU) will exist between FRA or the carrier, nor will there be any protections from discipline should the close call become known to FRA or the railroad (however, NASA's de-identification process provides inherent protections for employees). Current C^{3}RS statistics show that over 75 percent of close calls reported are unknown events and would never have become known had it not been for C^{3}RS. FRA believes this modified version of C^{3}RS provides an opportunity for FRA and the industry to enhance available data to provide vital insights into the safety of the railroad industry, learn from these close calls and unsafe events, and act to address preventable safety concerns before they can result in harm.

For FY 2023, FRA expects the C^{3}RS program to continue to grow in the number of participating railroads and number of employees covered, especially as employees of Class I railroads begin reporting under the program. FRA also plans to continue providing funding to the Short Line Safety Institute to develop, maintain, and perform as a Peer Review Team for the C^{3}RS program's participating Class II and Class III carriers.

Additionally, FRA is requesting funding through the R&D account to conduct an evaluation of the effectiveness of the C^{3}RS program. This will be the first formal evaluation of C^{3}RS since the program's initial implementation and lessons learned report was issued in 2019.[3]

Trespass Prevention
FY 2021 Enacted: $2.30 million
FY 2022 Continuing Resolution: $2.30 million
FY 2023 President's Budget: $0.40 million

Trespassing on railroad rights-of-way is the leading cause of rail-related fatalities, accounting for 67 percent of U.S. rail-related deaths in FY 2021. An average of nearly 555 trespassers died each year between FY 2017 and FY 2021. Since 1997, more people have been killed each year while trespassing than in motor vehicle collisions with trains at highway-rail grade crossings.

In 2018, FRA published the *National Strategy to Prevent Trespassing on Railroad Property,* which focused on four strategic areas to combat trespassing on railroad property: (1) data gathering and analysis; (2) community site trespass prevention assessments; (3) funding; and (4) partnerships with affected stakeholders. FRA worked diligently to implement and complete tasks identified in the 2018 strategy. S&O funding is requested in FY 2023 to advance new efforts to collect data to improve trespass prevention and conduct targeted outreach to communities affected by trespass suicide:

1. **Continued collaboration with suicide prevention organizations on outreach to targeted communities.** This funding will be used to analyze high-risk audiences to determine what information they know and what additional information they need to know about the dangers of trespassing on railroad property. FRA will work to design effective and timely messages to reach the target audiences, as well as determining the most effective communications channels to employ.

2. **Procure and analyze new data sources.** FRA continues to seek additional data sources to inform our efforts to curb trespassing on railroad property. FRA intends to incorporate into its geographic information system analyses additional statistical and demographic information from the Census Bureau to track additional data points that may lead to better targeting of FRA's anti-trespass efforts; data from local building offices on permits for construction of both highway-rail grade crossings and nearby building/structures to determine effects on trespass activity; and data from local police reports with greater detail about specific trespassing incidents to determine if additional information is available about what caused the accidents, and what additional collaboration with local law enforcement might provide appreciable reductions in the number of trespassing incidents. FRA also intends to conduct analyses of the effectiveness of FRA grant

[3] Federal Railroad Administration, Confidential Close Call Reporting System (C^{3}RS) Lessons Learned Evaluation – Final Report, February 2019.

funding used for trespass prevention projects. This effort will examine the trespass statistics and trends before and after grants were issued.

Funding

In addition to the funding requested in S&O, the FY 2023 Request will continue to advance a comprehensive approach to support trespass prevention projects through the Consolidated Rail Infrastructure and Safety Improvements (CRISI) program. The IIJA expanded CRISI eligibility to support activities that reduce or prevent trespassing, which could include trespass prevention capital and technology deployment projects, enforcement of railroad trespass laws, and suicide prevention activities. Since FY 2020, FRA has allocated approximately $3 million in S&O funds for pilot grants in the areas of railroad trespass law enforcement and suicide prevention. These types of activities will now be funded through the CRISI program.

Trespasser Prevention Summits

FRA will continue to build off the summits planned for FY 2022, during which FRA will meet with representatives from the counties with the highest instances of trespasser casualties to (1) collaborate with community leaders, law enforcement, railroads, and the public to consider learned best practices and develop local mitigation strategies; (2) provide information on availability of Federal grants; and (3) assist with outreach campaigns. For FY 2023, FRA intends to hold additional summits and add a second day to these meetings to also address grade crossing safety. These meetings will present analyses of statistical data to illustrate what is happening in these communities and share potential technologies that may help to prevent grade crossing collisions

Highway-Rail Grade Crossing Safety

FY 2021 Enacted: $1.33 million
FY 2022 Continuing Resolution: $1.33 million
FY 2023 President's Budget: $1.18 million

Collisions at highway-rail grade crossings are the second leading cause of rail-related fatalities, accounting for approximately one-third of all such fatalities. At each of the approximately 209,000 U.S. highway-rail grade crossings there is a potential for a collision between a train and highway vehicle. FRA expects the risk of highway-rail grade crossing incidents to remain a significant rail and public safety issue during the next decade.

FRA has adopted a comprehensive approach to grade crossing safety. Following FRA's 2018 *Grade Crossing Fatality Prevention Summit* to gather stakeholder perspectives, FRA conducted listening sessions in 2019 on grade crossing safety technology. FRA convened a symposium in FY 2020 to review findings from the listening sessions and developed a three- to five-year business plan to identify, evaluate, and implement the most effective low and high-tech solutions. The business plan also addressed facilitation of obtaining Federal, State, and local approvals and funding, monitoring effectiveness, and communicating project results.

FRA proposes to use FY 2023 S&O funding for the following efforts:

1. **Continue to evaluate highway-rail grade crossing and quiet zone incident trends and effectiveness.** Currently, there are approximately 955 quiet zones nationwide, which include approximately 5,800 crossings. FRA seeks funding to conduct an evaluation of highway-rail grade crossings within and outside of quiet zones to determine if the likelihood of collision risk is higher within quiet zones. These analyses will assist FRA to determine the potential effectiveness of current supplemental safety measures and reevaluate their effectiveness rates as provided in 49 CFR Part 222 – Use of Locomotive Horns at Public Highway-Rail Grade Crossings.

2. **Continue to manage and evaluate grants provided for grade crossing improvements and quiet zone establishment.** FRA grant programs have funded improvements to more than 1,000 grade crossings since FY 2015. FRA seeks funding to conduct a review of the grade crossing projects funded under its grant programs and analyze these improvements to determine their effectiveness. This effort will help identify programmatic adjustments that could maximize the safety benefits and cost-effectiveness of Federal grant funding.

3. **Continue to update the Grade Crossing Dashboard.** GXDash! provides regulators and educators with data related to grade crossing safety to assist in outreach initiatives and enforcement. Over the last five years, multiple state rail safety programs working in conjunction with FRA have hired and trained nine grade crossing and trespass inspectors. These state inspectors are trained, mentored, and qualified by FRA grade crossing and trespass inspectors and FRA's technical training standards division. These state inspectors are incorporated into FRAs grade crossing and trespass outreach efforts, investigations into blocked crossings, and grade crossing accidents. GXDash! is an important tool that helps FRA and state inspectors identify grade crossing safety trends and hotspots that require interventions.

Operation Lifesaver, a non-profit rail safety organization that previously received funding under the S&O account, will now receive its annual grant funding through the new Railroad Crossing Elimination program under changes proposed in the FY 2023 Request. FRA proposes to set aside $1 million for Operation Lifesaver under the Railroad Crossing Elimination program.

Washington Union Station
FY 2021 Enacted: $0.80 million
FY 2022 Continuing Resolution: $1.20 million
FY 2023 President's Budget: $1.20 million

Under FRA's 99-year out-lease to the Union Station Redevelopment Corporation (USRC)—a private D.C. nonprofit corporation—USRC possesses, operates, and maintains Washington Union Station at its sole cost and expense. There are no Federal employees, or other Federal presence, at the station. However, as the Federal fee simple owner of Washington Union Station, FRA fulfills its statutorily required role as the Authority Having Jurisdiction (AHJ)

at the Station ensuring compliance with applicable building design, construction, fire and life safety codes, standards, and guidance.

Historically in exercising its AHJ role, FRA limited the geographical scope of its oversight to the area of WUS leased to USRC under FRA's 1985 lease with USRC, and not the Federally-owned area occupied by Amtrak. Recently, FRA determined that in the interest of public safety, consistency of government oversight, and specifically the safety of railroad passengers and Amtrak employees, it would be prudent to exercise AHJ jurisdiction over all of the WUS complex owned by the Federal government. As such, FRA clarified its jurisdiction beyond the USRC leased area, and FRA's AHJ now covers all Amtrak projects within the Federal property. This decision increased the geographical scope and the projects subject to FRA AHJ review.

To fulfill its role and responsibility, FRA contracts to obtain the specialized knowledge to perform these duties, including inspections of the station, review of drawings and plans for new construction initiatives, and inspection of all repair work to ensure compliance with applicable building, fire, and life safety codes.

Railroad Safety Information System
FY 2021 Enacted: up to $4.40 million
FY 2022 Continuing Resolution: up to $4.40 million
FY 2023 President's Budget: $4.50 million

The Railroad Safety Information System (RSIS) is FRA's collection of data management systems that receive, organize, process, visualize, and publish information on railroad accidents and incidents, safety inspections and violations, and attributes from the U.S. DOT Highway-Rail Crossing Inventory. FRA uses data from RSIS in trend analysis, safety performance measurement, and resource allocation. The information is publicly available on FRA's website.

FRA's public website provides a dynamic, streamlined means to quickly access a wealth of railroad safety data and provides visualization of the different data sets. FRA also initiated the development of its new Asset Inventory of Railroads and Shippers (AIRS) application and a redesign of the internal inspection data website to provide better visualization of the inspection data. Funding will support continued development and maintenance of FRA's data websites and systems, including modernization of the underlying inspection database to enable integration with the new Portable Inspection Reporting Tool and Office of Chief Counsel's Railroad Correspondence System.

Control of Drug and Alcohol Use
FY 2021 Enacted: $1.17 million
FY 2022 Continuing Resolution: $1.17 million
FY 2023 President's Budget: $0.90 million

FRA's Drug & Alcohol (D&A) testing program (49 CFR Part 219) currently covers 140,000 employees in the railroad industry. Most recently, FRA addressed a requirement in the *Substance Use-Disorder Prevention that Promotes Opioid Recovery and Treatment for Patients and Communities Act (SUPPORT Act)* and reiterated in IIJA to amend Part 219 regulations to include railroad mechanical craft employees, adding another approximately 25,000 industry employees to FRA's testing program. FRA published the Final Rule adding mechanical employees on February 2, 2022, with an effective date of March 4, 2022.

FRA's challenge continues to be providing effective oversight of track construction and maintenance employers, as well as the 700 railroads in the industry. These employers require FRA-approved policies and Part 219 triennial compliance audit reports, which are currently produced as flat Microsoft Word files. In response to recommendations from a 2020 DOT Office of Inspector General (OIG) report[4], FRA is developing a systems approach and an IT system for compliance audits that would allow for rapid generation of reports, tracking of corrective actions, and analyzing findings in order to target audits with an empirical risk-based approach. Funding requested in FY 2023 will enable FRA to maintain is testing program and oversight activities.

Audit Management Program
FY 2021 Enacted: $0.23 million
FY 2022Continuing Resolution: $0.25 million
FY 2023President's Budget: $0.23 million

FRA established its audit management program in 2016 and created an Audit Management Division in the Office of Railroad Safety in 2020. While FRA is not exclusively an auditing organization, the agency strives to adhere to the Generally Accepted Government Auditing Standards (GAGAS) as much as possible. FRA coordinates oversight of compliance with regulations that require railroads to create and implement performance-based plans and conducts audits of railroads' plans and programs. Proposed funding will enable FRA to obtain contractor resources to (1) conduct audit training for inspectors and other positions that will perform audits or assist with the audit process, (2) develop tools and systems to coordinate, support, and evaluate the audit management program, and (3) to ensure ongoing quality assurance of all audits conducted by the FRA.

[4] Department of Transportation Office of Inspector General, Oversight Weaknesses Limit FRA's Review, Approval, and Enforcement of Railroads' Drug and Alcohol Testing Programs, April 29, 2020.

Grant & Project Development Technical Assistance and Oversight
FY 2021 Enacted: $0.50 million
FY 2022 Continuing Resolution: $1.51 million
FY 2023 President's Budget: $3.00 million

FRA's authorized grant programs provide for an administrative takedown to dedicate resources to grant administration, technical assistance, and oversight. However, FRA also currently administers grants and provides technical assistance to both public- and private-sector sponsors where the agency is prohibited from using its program-specific takedowns. These include INFRA grants, support provided to the Build America Bureau on RRIF and TIFIA rail projects, California High-Speed Rail, and other publicly- and privately-sponsored projects. These projects that fall outside FRA's currently authorized grant programs are often complex and require additional environmental, engineering, and legal resources to ensure they are properly planned, developed, and implemented.

What benefits will be provided to the American public through this request and why is this program necessary?

FRA's safety programs provide tangible safety and operational benefits to the American public and railroad industry by supporting the nation's economic productivity and ensuring the safety of its passenger and freight mobility needs. The FY 2023 request continues to target FRA's resources at the most pressing rail safety issues.

Preventing trespassing on railroad property and increasing safety at grade crossings. Preventing trespassing and increasing grade crossing safety will not only reduce the number of fatalities but will also improve the efficiency of the transportation network. These two leading causes of rail-related fatalities accounted for nearly 800 deaths in FY 2020. The 209,000 at-grade highway-rail grade crossings in the United States each present the potential for a collision between a train and highway vehicle. Incidents of trespassing, trespassing suicide, and grade crossing collisions are not only railroad and public safety issues, but also potential markers of inequity in our transportation system and land-use planning policies. The FY 2023 Request supports a comprehensive approach to addressing these leading causes of rail casualties through safety regulation and enforcement, data analysis, infrastructure improvements, and investments in community outreach and social services.

Protecting passengers and railroad crews on the more than 500 million annual rail passenger trips. The rate of rail-related accidents and incidents has fallen by 82 percent over the last 40 years. Moreover, the number of employee on-duty fatalities has decreased by 19 percent in the last decade. Although these safety improvements are noteworthy, FRA continues to work to find ways to further enhance railroad safety.

An important new effort for FRA and the railroad industry is implementation of the Risk Reduction and System Safety rules issued in 2020. These new rules will bring a proven framework to improve railroad safety through the implementation of safety management systems. The freight rail Risk Reduction Plans (RRP) and passenger rail System Safety Plans

(SSP) that railroads must develop will bring a comprehensive, system-oriented approach to improving safety by describing how a railroad will manage risk by formally identifying and analyzing applicable hazards, determining risk, and developing mitigations to address the associated hazards and risks. RRP's and SSP's are proactive and systematic approaches to actively promote continuous safety improvement and improve safety culture.

Beating and recovering from the COVID-19 pandemic. FRA's safety enforcement actions are helping to maintain critical freight and passenger rail operations in a safe manner, support commerce and economic recovery, and prevent the spread of the virus.

Ensuring railroads operate safely to support economic productivity and meet passenger and freight mobility needs. FRA will remain diligent and examine new approaches to advance continuous safety improvement and make rail transportation as safe as possible.

Monitoring operations and providing technical assistance in support of the most important rail safety technology in more than 100 years to improve system performance. PTC systems are life-saving technology that prevent certain railroad-related accidents and near accidents.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

RAILROAD RESEARCH AND DEVELOPMENT
APPROPRIATIONS LANGUAGE

RAILROAD RESEARCH AND DEVELOPMENT

For necessary expenses for railroad research and development, [$58,826,000]*$58,000,000* to remain available until expended*: Provided, that of the amounts provided under this heading, up to $3,000,000 shall be available pursuant to section 20108(d) of title 49, United States Code for the construction, alteration, and repair of buildings and improvements at the Transportation Technology Center*.

Explanation of Changes: The FY 2023 President's Budget includes language to support the new construction authority at the Transportation Technology Center (TTC) provided by the Infrastructure Investment and Jobs Act. The TTC activities were included under FRA's Safety and Operations account in the FY 2022 President's Budget.

EXHIBIT III-1
RAILROAD RESEARCH AND DEVELOPMENT
Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2021 ENACTED	FY 2022 CR	FY 2023 PRES. BUD.
Track	$ 10,179	$ 10,179	$ 11,679
Rolling Stock	$ 10,322	$ 10,322	$ 10,672
Train Control and Communication	$ 8,086	$ 8,086	$ 9,086
Human Factors	$ 6,042	$ 6,042	$ 6,792
Railroad Systems Issues	$ 6,371	$ 6,371	$ 19,771
TOTAL	$ 41,000	$ 41,000	$ 58,000
FTEs			
Direct Funded	0	0	0

Program and Performance Statement

FRA's Research and Development (R&D) Program is focused on improving railroad safety. It provides scientific and engineering support for the agency's safety enforcement and regulatory rulemaking efforts. The program also identifies and develops emerging technologies for the rail industry to adopt voluntarily. The outcomes of the research and development are reduced railroad accidents and incidents. The program also supports intercity passenger rail development by providing technical assistance, equipment specifications, proposal evaluations, and Buy America compliance research. The focus of FRA's program is to fill the gaps in research not taken on by industry itself, and to partner with industry to leverage private R&D investment in a manner that ensures broader public safety benefits are achieved.

In addition to improving safety, the program contributes significantly towards activities to achieve and maintain a state of good repair, develop the rail industry's workforce, combat climate change, and grow the economy.

The program has the following areas of research:

- **Track Program** – Reducing derailments due to track related causes.
- **Rolling Stock Program** – Reducing derailments due to equipment failures, minimizing the consequences of derailments, and minimizing hazardous material releases.
- **Train Control and Communication Program** – Reducing train-to-train collisions and train collisions with objects on the line and at grade crossings.

- **Human Factors Program** – Reducing accidents caused by human error and optimizing human performance in railroad operations.

- **Railroad System Issues Program** – Prioritizing R&D projects on the basis of relevance to safety risk reduction, climate change and energy efficiency, equity, and other DOT goals.

EXHIBIT III-1a
FEDERAL RAILROAD ADMINISTRATION
RAILROAD RESEARCH AND DEVELOPMENT
SUMMARY ANALYSIS OF CHANGE FROM FY 2022 TO FY 2023
Appropriations, Obligations, Limitations, and Exempt Obligations
($000)

	$000	**FTE**
FY 2022 CR	$41,000	0
ADJUSTMENTS TO BASE:		
Non-Pay Inflation	820	
SUBTOTAL, ADJUSTMENTS TO BASE	**820**	**0**
PROGRAM INCREASES		
Equipment	194	
Track	1,296	
Rolling Stock	144	
Train Control and Communication	838	
Human Factors	629	
Railroad System Issues	13,079	
SUBTOTAL, PROGRAM INCREASES	**16,180**	**0**
FY 2023 REQUEST	**58,000**	**0**

Detailed Justification for the Railroad Research and Development

FY 2023 – Railroad Research and Development – Budget Request ($000)

Program Activity	FY 2021 Enacted	FY 2022 Continuing Resolution	FY 2023 President's Budget
Track	$10,179	$10,179	$11,679
Rolling Stock	$10,322	$10,322	$10,672
Train Control and Communication	$8,086	$8,086	$9,086
Human Factors	$6,042	$6,042	$6,792
Railroad Systems Issues	$6,371	$6,371	$19,771
Total	**$41,000**	**$41,000**	**$58,000**
FTE	**0**	**0**	**0**

What is this program and what does this funding level support?

The mission of FRA's Research and Development (R&D) program is to ensure the safe, reliable, and efficient movement of people and goods by rail through applied research. FRA's R&D program aligns closely with the Department's key transportation priorities for FY 2023:

- **Safety:** FRA's R&D core program focus remains safety improvement, including providing the scientific and engineering basis for safety enforcement, oversight, and regulation.
- **Economic Strength and Global Competitiveness:** FRA R&D will advance the transformation of the rail infrastructure into a 21st century system that creates more communities of opportunity, accelerates equitable economic growth, and increases global competitiveness.
- **Equity:** FRA's R&D program will continue to invest in rail technologies that increase engagement opportunities for underserved communities. R&D will continue initiatives and programs to address diversity, equity, and inclusion within the railroad industry and by working with minority serving institutions and supporting the newly proposed National Railroad Institute.
- **Climate and Sustainability:** FRA's R&D program will undertake research that will investigate the efficacy of clean fuels and advanced motive power technologies to improve energy efficiency and reduce emissions of rail transportation.

- **Transformation:** Historically, FRA's R&D program has invented new technologies that transformed railroad safety inspection, passenger rail crashworthiness, and operating practices, among other innovations. The FY 2023 President's Budget continues investment in the next generation of innovative technologies that will future-proof rail infrastructure as safe, equitable, and long-lasting transportation.

Work undertaken in R&D contributes to today's safety performance. R&D projects typically follow one of the following paths to implementation:

1. **Voluntary Industry Adoption:** R&D by FRA is necessary for conducting higher-risk and longer-term projects, which private industry would not otherwise undertake, to develop advanced technologies and practices. In many cases, industry voluntarily adopts these safety practices and technology.
2. **Enforcement:** R&D by FRA creates new technology for efficient and effective oversight of railroad compliance with safety regulations.
3. **Regulation:** R&D by FRA is necessary to develop the scientific and engineering foundation for regulatory actions to ensure safety.
4. **Incorporation into Industry Standards and Recommended Practices:** The results of research performed by FRA are often used to develop, modify, or update relevant industry standards. These include standards created by the American Public Transportation Association (APTA) and the Association of American Railroads (AAR). Industry standards can leverage the output of FRA R&D to achieve safety benefits.

FRA's R&D program is organized around the following five rail safety disciplines:

- **Track Program**
  - Track and structures performance, inspection technology and processes, and substructure assessment
  - Rail integrity assessment and defect detection technologies
  - System performance and analysis, including predictive analytics
  - Track and train interaction including, wheel-rail interface, vehicle track modeling, simulation and validation

- **Rolling Stock Program**
  - Rolling stock and components, onboard and wayside monitoring systems, and material and design improvements
  - Hazardous materials transportation risk reduction, tank car damage assessment, inspection, and integrity
  - Safety research on energy efficiency technologies
  - Clean Fuel and Cryogenic Materials Research
  - Train occupant protection, locomotive and passenger car safety and performance

- **Train Control and Communication**
  - Development and testing of Positive Train Control (PTC) technologies and communication systems
  - Interoperability standards

- Communication cybersecurity
- Automation and automated vehicle research
- Drone-based technology research
- Train control and grade crossing risk simulation and modeling
- Grade crossing safety technologies and pilot studies, including intelligent rail systems, blocked crossings, and trespass prevention
- Development and testing of train control and communication systems

- **Human Factors Program**
  - Railroad Organizational Culture and Safety Performance
  - Railroad Worker & Operator Performance
  - Railroad Technology, Automation & Systems Design
  - Highway-Railroad Grade Crossings, Railroad Trespass and Suicide Prevention

- **Railroad System Issues Program**
  - Railroad environmental issues and energy efficiency research
  - Railroad industry workforce development research
  - Research, Development & Technology (RD&T) research strategy
  - Safety risk analysis and performance-based regulations
  - Research prioritization
  - Strategic collaborations and partnerships
  - Locomotive safety
  - Rail Safety IDEA (Innovations Deserving Exploratory Analysis) program grants with the Transportation Research Board
  - Program or Project evaluation, including the Transportation Research Board's independent review of FRA's R&D programs
  - Technology Transfer
  - R&D facilities at the Transportation Technology Center (TTC) managed through a public-private partnership, partnership RD&T related support services

The FY 2023 President's Budget includes $58 million for FRA's R&D program, which represents a $17 million increase over the FY 2021 Enacted Budget of $41 million. Of this $17 million, approximately $13.8 million will be used for the following initiatives that support IIJA and Biden-Harris Administration transportation priorities:

- **Climate and Resilience** – $5 million in new resources is requested to advance research, development, and testing of clean energy solutions that will build on rail's already superior energy efficiency and contribute to reductions in the transportation sector's greenhouse gas emissions.
- **Rail R&D Center of Excellence** – Up to $5.8 million is requested for grants to institutions of higher education to establish and maintain a rail R&D center of excellence, as authorized by IIJA. This center will carryout projects to advance a wide array of railroad safety, operational, and workforce improvements.
- **Transportation Technology Center (TTC) Construction** – $3 million is requested for critical repairs and improvements at FRA's TTC facility in Pueblo, CO, as authorized by IIJA. This work is associated with FRA's responsibility as the property

owner and are necessary to ensure the site can continue to support the valuable research, testing, safety training, and first responder training that are conducted at the facility.

TRACK RESEARCH PROGRAM

The FY 2023 Request includes $11.68 million for FRA's Track Research Program.

The number of accidents due to track-related causes decreased by nearly 40 percent from 2011 to 2020. This reduction is due, in part, to the industry's adoption of technologies developed by FRA, such as:

- Autonomous inspection technologies, including highly successful Autonomous Track Geometry Measurement System (ATGMS), used by many railroads throughout North America to complement visual inspections.
- Gage restraint measurement system, a technology to assess the integrity of ties and fasteners.
- Vehicle-track interaction monitoring system developed for Amtrak and Class I freight railroads.
- Joint bar inspection system, an image-based technology that detects defects in rail joints.

The Track Research Program prepares for the future of rail transportation through applied research, development, and demonstration in the areas of rail performance, predictive analytics, track stability, track inspection, and vehicle track performance. FRA conducts applied research to test concepts and further the understanding of safety problems causing accidents and incidents. Research that provides a deeper understanding of the efficacy of technology, systems, practices or standards may lead to the development and testing of a prototype and demonstration with industry. A project like the Autonomous Internal Rail Flaw Inspection Device began as applied research and was developed utilizing existing and new technologies.

As new technologies continue to emerge and train axle loads and speeds increase, the timely development of technical information, data, and expertise is crucial to provide a basis on which to make decisions about issues affecting the safe operation of rail vehicles on U.S. track. The Track Research Program supports the goals and objectives of the DOT/FRA by conducting safety related research for new and in-service railroad system investments; developing and demonstrating new track condition assessment technologies; and coordinating research teams between railroads, universities, industry suppliers, and the government.

The Track Research Program endeavors to prevent high-consequence derailments that result in the loss of human life and cause significant damage to property and communities by:

- Identifying, understanding, and mitigating track-related failure modes that pose significant risk to safe freight and passenger rail operations.

- Ensuring the safe and effective implementation of new and innovative technologies and maintenance strategies intended to mitigate adverse effects on track infrastructure.
- Developing procedures for vehicle and track simulation building and validation.
- Providing guidelines for FRA's Office of Railroad Safety and the railroad industry on how to build, model, and simulate different vehicle or track components to better understand the fundamentals of vehicle/track interaction and reduce derailment risk.
- Predicting, detecting, and preventing rail defects that lead to train derailments.
- Investigating advanced materials and systems that ensure a state of good repair.
- Preventing track buckles.
- Leveraging predictive analytics to identify conditions and safety-related issues in the track infrastructure before they become problematic.
- Exploring the application of advanced technologies such as unmanned aircraft vehicles, artificial intelligence, and autonomous inspection tools to improve rail safety in addition to visual inspections.
- Increasing safety by reducing track support caused derailments.
- Supporting research partners in derailment investigations.
- Supporting research partners and the railroad manufacturing community in vehicle qualification and evaluation testing.
- Understanding the root cause of rolling contact fatigue in wheels and rails and developing methodologies, techniques, and inspection tools to identify problematic conditions before they become a safety threat.

Strategic collaboration partners for the Track Research Program include FRA's Office of Railroad Safety, American Short Line Regional Railroad Association (ASLRRA), Association of American Railroads (AAR), multiple railroads and universities.

Anticipated FY 2022 accomplishments for the Track Research Program include:

- Complete the development of an artificial intelligence (AI)-based application that will eventually allow real-time inspection of grade crossings for presence and functionality of safety-related infrastructure, such as gate arms.
- Initiate field testing and demonstration of systems that will self-enunciate track safety issues leveraging the latest developments in sensor and communications technologies.
- Initiate project(s) to assist the industry in the adoption of unmanned aircraft systems (UAS/UAV), concentrating on technologies that can assist in achieving Beyond Visual Line of Sight (BVLOS) operations over railroad track, and the adaption of terrestrial inspection technologies to drone-based operation.
- Develop new technologies to assess buckling risk of track from moving platforms. RD&T will expand and advance rail adjustment software and trainings to reduce errors in rail adjustments that can lead to track buckles or rail breaks.
- Assess the resistance of track to applied lateral track buckling loads relative to the influence of moisture, content, fouling, and degree of ballast consolidation/compaction.
- Continue research on ground-penetrating radar (GPR) to provide quantitative and qualitative data and analysis for ballast instability—in support of multiple FRA Office of Railroad Safety (RRS) projects.

- Develop and demonstrate a machine vision-based ballast inspection system mounted on a moving platform capable of detecting ballast condition and quantifying of changes in fouling level.
- Complete a revenue service demonstration of an automated decision-making tool that will align, segment, process, analyze and report on ATGMS data, to predict areas approaching maintenance and safety limits
- Initiate a long-term study investigating the effects of varying track and operational parameters on fastening system performance, including those featuring variations of spikes for hold-downs, as well as rail neutral temperature loss and remediation in a revenue service environment.
- Continue to collaborate with the railroads to establish root causes of rolling contact fatigue (RCF) and wheel/rail surface damage and a method to effectively evaluate the depth of RCF to help in grinding and removal of RCF.
- Continue characterizing track geometry for different operations in the U.S. rail network.
- Conduct testing, simulations and evaluate railroad test results for RRS in vehicle qualification
- Assist RRS in testing and qualification of FRA track geometry measurement systems and provide guidelines for testing the accuracy of the measurement systems.
- Complete construction of the curved test track at the TTC and start demonstration testing using this track.

Track and Structures

Track and Structures – Rail Performance

Broken rail derailments and accidents cost about $50 million per year, more than any other track defect. FRA works with researchers and the railroads to improve rail performance and rail defect detection.

Activities:

- Develop methodologies and technologies to better inspect for internal rail flaws at high speed, in special track work, in welds and under difficult rail surface conditions.
- Optimize 3D mapping of internal rail flaws.
- Publish new materials on how rapidly internal rail flaws grow in modern rail steels and in welds.
- Test non-contact internal rail integrity inspection on a major Class 1 railroad in the US.

Expected Outcomes:

- Detect and characterize smaller rail flaws earlier.
- Develop a model to predict the growth of internal rail flaws that can be used to assess the frequency of ultrasonic test inspections.
- Conduct ultrasonic test inspections at higher speeds and more frequently without reducing track capacity.

Track and Structures – Track Inspection Technology and Processes

This research improves the track inspection process to automate the detection of conditions that causes track failure and report the conditions and location to the railroad for remediation.

Activities:

- Continue research and development of change detection technology suitable for deployment on autonomous inspection platforms. In addition, develop automated data analysis of track inspections to determine safety related changes to the track structure and report this information to stakeholders.
- Continue developing innovative approaches to imbed sensors and detection and communications technologies within the track structure to allow for a type of self-enunciation when conditions warrant remedial maintenance or pose a threat to safe rail operations.

Expected Outcomes:

- Advance the state of the art with respect to track condition awareness and safety reporting efficiency through extended deployment of automated track change detection technology throughout the rail industry.
- Develop technology that permits railroad track to communicate its "state-of -repair" directly to the railroads, in a manner that is somewhat analogous to the way modern devices communicate via the internet of things (IoT).

Track and Structures – Special Activities

This research area is focused on improving safety and state-of-good-repair of bridges, structures, track design, and special track work. The scope of this research includes collaborative projects with industry, including the American Association of Railroads (AAR).

Activities:

- Continue development of automated bridge and impact detection technologies. RD&T will continue to invest in safety applications for UAVs in the railroad and will support technical development of safe methods to conduct beyond visual line of sight (BVLOS) inspections. This research will include Federal Aviation Administration and rail industry participation.

Expected Outcomes:

- Bridge inspection technologies that provide accurate assessment of key structural performance and impact detection that leverage advanced sensor designs and communication technologies.
- Incremental development of technical capabilities that can enable beyond visual line of sight (BVLOS) drone operations over railroad track, including GPS-denied flight operations. New drone-based sensor and imaging technologies to demonstrate remote inspection of special track work. Advances in real-time, on board track image processing to enhance drone inspection efficiency. Capability demonstrations in coordination with FAA UAS office.

R&D Facilities and Equipment – On-Track Research and Testing (FRA Research Assets)
This research seeks to conduct track research and testing to prevent derailments caused by track and structures.

Activities:

- Continue revenue service testing focused on the effects of cold weather on the integrity of the track system.
- Continue to investigate root causes of potential issues that may arise during FY 2023 affecting safe Heavy Axle Load (HAL) operations.
- Install and evaluate new and innovative ideas and technologies, both at the TTC and in revenue service, intended to mitigate the adverse effects HAL operating conditions pose to track system integrity.

Expected Outcomes:

- Improved track components and maintenance methods to safeguard against cold-weather related track issues and heavy-axle load environment.

Track and Structures – Track Stability
This research seeks to prevent track buckle derailments and roadbed failures caused by track support and subgrade issues.

Activities:

- Work to commercialize technology to measure rail stress without a reference.
- Finalize the design and build plans for a rail stress and rail neutral temperature test bed at the TTC, in collaboration and cost sharing with industry.
- Continue lateral stability and track buckling best practices research, including software development and trainings.
- Field test new rail neutral temperature measurement prototypes and moving platform measurement systems that can aid in assessing buckling risk.
- Further develop and refine ballast models that predict conditions and behaviors that can adversely affect track stability.
- Advance technologies that identify, categorize, and assess risks associated with track support failure and/or derailment.
- Develop reliable and automated method to assess track fouling and the development of safety criteria by understanding subgrade failures.
- Characterize ballast mechanistic behavior and properties.
- Further develop vertical track deflection measurements to provide a structural indication of the track support structure with large deflection that indicate weakness in the track support layers.
- Further refine Gage Restraint Measurement Systems (GRMS) technology to identify potential track strength weakness at the rail-tie interface.

Expected Outcomes*:*

- Automated method to assess track fouling and the development of safety criteria through understanding of subgrade failures.
- Improved understanding of ballast mechanistic behavior and properties.

- An improved vertical track deflection measurements conducting revenue service testing.
- Refinement of GRMS technology to identify potential track strength weakness at the rail tie interface.

System Performance and Analysis

System Performance & Analysis – Predictive Analytics
This research focuses on the utilization of "Big Data" sources as well as the automation of track-related data processing and analyses to improve track safety and decrease derailments.

Activities:
- Complete all research efforts related to development of a machine-vision approach for inspecting highway-rail grade crossings using locomotive-based forward-facing video.
- Continue research efforts focused on the application of artificial AI into track-related safety inspection techniques. RD&T will complete the development and testing of advanced forecasting models for predicting areas approaching maintenance and safety limits using autonomous track geometry systems (ATGMS) in a revenue service environment.

Expected Outcomes*:*
- Continue to improve automated processing capabilities in order to move from near real-time to real-time analysis of track-related data.
- Work with the Office of Railroad Safety and the American Railway Engineering and Maintenance-of-Way Association (AREMA) to implement a standardized procedure and recommended practice for evaluating the effectiveness of existing and emerging track inspection technologies prior to use in industry.
- Implement advanced forecasting models for ATGMS-based data sources.
- Work with the associated vendor to establish a Phase II-B or Phase III effort (i.e., commercialization) for the AI-aided machine vision applications for highway-rail grade crossing safety using locomotive-based forward-facing video.

System Performance and Analysis - Vehicle-Track Performance
This research focuses on the rail vehicle dynamics created by how the shape of the wheels and rails interact and also by variations in the track structure.

Activities:
- Complete a procedure to utilize the tangent and curved test track at TTC to validate the accuracy of track geometry measurement systems used by FRA and the industry.
- Complete research studying the effectiveness of rail surface inspection systems to quantify rolling contact fatigue in revenue service track.
- Complete research examining wheel-rail contact inspection and analyze the system's effectiveness in locating potential track problems.
- Continue the research in development of 3-dimensional wheel/rail contact.
- Continue to support the development of procedures for both model building and model validation.

- Continue to support the development of procedures to include advanced friction models that examine the effects of falling friction, speed, and third body layer on wheel-rail contact forces, and 3D contact geometry.
- Support testing and modeling of vehicle suspension components.
- Support building of vehicle and track models for various equipment and operating practices to be used for derailment investigations or developing safety.
- Completion of the model perform simulation to see the response of the vehicle to multiple track input.
- Development of recommendations on third body layer influence and parameters, and operating conditions that can cause rolling-contact fatigue (RCF).

Expected Outcomes:

- Developed procedures for both model building and model validation.
- Developed procedures to include advanced friction models that examine the effects of falling friction, speed, and third body layer on wheel-rail contact forces, and 3D contact geometry.
- Test results and modeling of vehicle suspension components.
- Progress toward building of vehicle and track models for various equipment and operating practices to be used for derailment investigations or developing safety.
- Completion of the model perform simulation to see the response of the vehicle to multiple track input.
- Recommendations on third body layer influence and parameters, and operating conditions that can cause RCF.

Deployment of Expected Outputs/Products:

- Partnerships and stakeholder engagement form the foundation of RD&T's technology transfer methodology leading to the adoption of research products. Autonomous Track Geometry Monitoring System (ATGMS) is an example of Track's collaboration with industry and universities that is leading to the deployment of ATGMS systems throughout the industry.

ROLLING STOCK PROGRAM

The FY 2023 Request includes $10.68 million for FRA's Rolling Stock Research Program.

The Rolling Stock Research Program performs research activities relating to critical transportation topics that promote rail safety, improve rail infrastructure and the mobility of goods and passengers, as well as topics that focus on preserving the environment. The Rolling Stock Research program conducts research to reduce railroad accidents and incidents due to rail equipment related causes as well as research to reduce fatalities and injury severity to passengers and crew members involved in passenger train accidents and incidents. The program leads research, development, and evaluation of advanced rolling stock inspection techniques, materials, and components. Hazardous material (HazMat) research focuses on improving transportation processes, and the safe use of clean fuels, and new engine and energy savings technologies that focus on preserving the environment. The Rolling Stock Research

program produces solutions contributing to all DOT strategic goals: safety, economic strength and global competitiveness, equity, climate and sustainability, and transformation.

This Program's research helps determine criticality and methods for proactively identifying, analyzing, and evaluating potential failure modes. Under the Rolling Stock Research Program, applied research is conducted to test concepts and further the understanding of safety problems causing accidents and incidents. Research topics that provide deeper understanding of technology, systems, practices or standards may lead to the development and testing of a prototype solution and demonstration with industry.

The Rolling Stock Research Program helps mitigate potential risks of unexpected failures occurring in rolling stock that can cause delays and disruptions to transport services or even result in derailment or collision accidents by:

- Conducting research and testing pertaining to bulk packaging traveling by rail, such as tank cars, rail cars, and intermodal tanks.
- Testing and understanding the different hazards of materials to be considered for transportation over the rail network.
- Providing engineering support in the research, design, fabrication, and test planning of ISO intermodal containers, tank car fire testing and the structural performance of this equipment when used as fuel tenders and energy products as commodity transport.
- Improving defect detection, monitoring, inspection and control of rolling stock equipment and components to help reduce risks through the prevention of above-track equipment and component failures to improve safety and reduce risks.
- Developing and demonstrating the effectiveness of designs, strategies, and technology solutions that address structural integrity of locomotives and passenger cars, to decrease the risk of fatalities and injuries in the event of accidents.

Strategic collaboration of partners for the Rolling Stock Research Program include FRA's Office of Railroad Safety, the Pipeline and Hazardous Materials Safety Administration (PHMSA), the Maritime Administration (MARAD), the ASLRRA, the AAR, multiple railroads, associations, manufacturers, and universities.

Anticipated FY 2022 accomplishments for the Rolling Stock Research Program include:

- Provide DOT with information on the survivability of UN-T75 portable tank under fire conditions in case of train derailment accident.
- Determine the tank car behavior and failure modes under normal transportation, and provide a foundation for modifying, eliminating, or creating standards by leading research and capturing the results.
- Provide a realistic fire exposure to the test assembly (tank on flatcar) and make several key measurements, including interior and external temperatures, tank pressure, blast pressure (if applicable), and heat flux.
- Identify possible studies to address defects that affect the structural integrity of safety equipment and packages and projects that can be proactive for existing and future safety equipment and packages.

- Provide information on the performance and durability of safety equipment for tank cars and portable tanks, so DOT has the required information to justify, modify, eliminate, and create safety standards.
- Increase understanding of how failures occur and how to best prevent or manage the consequences of such failures through improved equipment design and protection and evaluate and document damage to railroad tank cars.
- Increase understanding of the structural performance of cryogenic liquid tenders and tank cars that can transport cryogenic liquid.
- Develop an online HazMat release probabilistic risk assessment platform for real-time, local track risk analysis.
- Perform grade-crossing impact test of cryogenic liquid tender and develop guidance documents for the Office of Railroad Safety on natural gas fuel usage by the nation's railroads.
- Design, develop, and demonstrate prototypes of effective wayside and onboard technologies that can provide component health monitoring and increase understanding of equipment failure mechanisms and facilitate mitigation to reduce public safety risks.
- Develop a system to power advanced detection devices (technologies to detect defects on rolling stock equipment and preventable failures) and an explanation of wheel fatigue to help mitigate wheel failure.
- Improve inspection of hot/cold wheels, preventive maintenance of air brake systems, improved train braking performance, operational safety and reduced risks from air brake related incidences.
- Quantify the effects of tread braking on wheel damage mechanisms and fatigue life, develop and conduct vehicle dynamics simulations, and demonstrate results that could be used by industry and universities.
- Conduct simulations to improve safety of train operations and improve the network topology to have the topological structure to offer robustness, resiliency, efficiency, and effectiveness.
- Develop validated scaling laws for modeling and simulation of rail car fire growth predictions, a list of toxicity measurement methods, and final recommendations and reporting on performance of diesel multiple units (DMU) under dynamic loads.
- Identify modern effective evacuation modeling tools for rail applications and develop a plan for integration of evacuation simulation tool and fire dynamics models.
- Validate new LED headlights and assist in adopting new standards and regulations for LED lights on locomotives.
- Improve the Crash Energy Management (CEM) capabilities of existing (in-service) passenger equipment through cost-effective adaptations and retrofit technology and industry standards related to passenger car safety based on sound engineering derived from research outcomes.
- Evaluate results from a planned vehicle-to-vehicle test with respect to override inhibition. (This test was delayed from FY 2021 due to travel restrictions imposed by the COVID-19 pandemic.)
- Develop technical reports on side strength alternatives and implications/impacts of potential changes to the existing FRA requirements on the effectiveness of retrofit collision posts on crashworthiness of legacy locomotives.

- Research and testing of means to improve the integrity of glazing (window) securement will be available which will provide insight on ways to improve passenger containment in train accidents in which cars derail, roll over and slide on their sides.
- Present findings on means to improve the integrity of glazing (window) securement to the passenger railcar manufacturing industry for its consideration in the development of new passenger car glazing system designs.

Hazardous Material (HazMat) Transportation

This research program focuses on improving the safety of rail transport of hazardous materials and is conducted in cooperation with the railroad and tank car industry, PHMSA and Transport Canada. This program seeks to develop new standards and methodologies to evaluate the safety and performance of current and new tank car designs used to transport hazardous material.

HazMat – Tank Car Research

This research develops and improves the packages that carry hazardous materials, helping to reduce the release of material during rail accidents and incidents.

Activities:

- Conduct research on developing and improving packages that carry hazardous materials to reduce the release of hazardous material and minimize the consequences during rail accidents and incidents.
- Conduct research on nondestructive evaluation (NDE) probability of detection (POD) with the tank car industry and stakeholders, and identify the capabilities/limitations of new and advanced NDE methods for tank car inspections.
- Conduct research on the effects of corrosion on railroad tank car structures and the potential use of state-of-the-art NDE methodologies for remaining tank car shell thickness measurement.
- Gather information on the newer types of tank cars and the common failure modes and determine if newer weld test panels are needed for future POD studies.
- Conduct research on tank car impact, developing and improving test methods, providing data for improving modeling methods, design, and construct test fixtures, and preparing and testing various tank car designs.
- Research efforts to analyze and provide the data for validation of finite element analysis models and report on test and model results.
- Conduct research on the analysis of collected impact test data to arrive at limiting conditions for coupling speed and impacting mass.

Expected Outcomes:

- Improve the computer model and update current regulation on thermal protection.
- Update computer model to include cryogenic tank cars.

HazMat – Structural Integrity

The goal of this project is to understand the performance and durability of safety equipment and protective systems for tank cars and portable tanks. This research area focuses on the current fleet, identifying problems with current equipment and packages.

Activities:

- Research efforts to evaluate puncture resistance of various tank cars of the DOT 113 design in standardized shell impact scenarios, examining effects of parameters such as support conditions, impactor size, etc. on shell puncture.
- Develop computational models of tank car designs under impact conditions and compare test data with model results to validate models.
- Develop design strategies for improving the structural crashworthiness of passenger rail cars relative to existing designs.
- Develop specifications, regulations, and evaluations of compliance with FRA regulations.

Expected Outcomes:

- Improve the performance of pressure relief devices.
- Improve the rollover protection for new tank cars.

HazMat – Accident Consequence Reduction

This research will study the loading and unloading practices of hazardous material to improve the operating practices and securement of packages for safe transportation and reducing non-accident releases.

Activities:

- Evaluate the performance of top fittings protection used on current tank car designs, particularly those used in unit trains carrying flammable materials under rollover conditions.

Expected Outcomes:

- Better understanding of how failures occur and how to best prevent or manage the consequences of such failures through improved equipment design and protection.
- Help FRA evaluate and document damage to railroad tank cars and study and capture the results of the liquid/vapor release flow on pressure relief.
- Understand the tensile properties of different steel used on the fabrication of tank cars.

Rolling Stock Equipment and Components (RSEC)

Research efforts in the Rolling Stock Equipment and Components (RSEC) program area focus on development and improvement of equipment defect detection and control. Both wayside and on-board detection and control systems offer diverse platforms for such research and demonstration.

RSEC - Rolling Stock Component Safety

Proactively prevents above-track equipment and component failures (e.g., situational hazard prevention), and provides the analytical and technical basis to develop equipment safety standards while also improving safety, reliability, and inspectability of rail equipment, technologies, and material.

Activities:

- Research train makeup, train operations, and train handling developments to address air brake signal propagation time, impact on application and release, air brake system leakage on long trains, and brake pipe pressure on cars near the tail end of trains.
- Research high buff and draft forces under undulating territories, train handling of 200-car trains or longer, and individual car dynamic behavior and safety during curve negotiation.
- Identify brake systems that are not functioning properly by detecting wheels that are inappropriately hot or cold, and assess the implementation of wheel temperature detector (WTD) technology and its effectiveness in improving the safety of train operations and detection of air brake system defects on moving trains.
- Continue research to reduce wheel failures, including the causes of vertical split rims and shattered rims, in collaboration with industry.
- Continue research on evaluating current failure modes and characteristics as well as future steps to minimize contributions to failures.
- Continue to research the effects of contact pressure, slip ratio, lubrication, and temperature on the development of RCF cracks and wear of railway wheels and investigate how temperature at the wheel-rail interface can affect wheel surface performance.
- Continue research to determine the best location in the bearing to sample bearing grease, as determined by the worst grease condition.
- Continue research to demonstrate if it is possible to identify the grease metrics associated with bearing failure modes based on grease sampling and state-of-the-art statistical methods.
- Continue research to test the ability of the current baseline bearing rubbing lip seals versus frictionless seals to prevent water ingress over the life of the bearing.
- Continue research to determine if water ingress will occur in revenue service bearing seals through environmental fluctuations and correctly identify fretting corrosion, as differentiated from water damage, and mitigate it in revenue service.
- Research, design, prototype, and test an electrical power supply system (EPSS) DC access/battery charger that provides a standard 24 volts DC interface to safety and security devices where desired.
- Continue research to design and build a three-car test rack for studying the selected prototype ecosystem platform and utilize the EPSS test rack to minimize build costs and utilize the test rack for in-lab testing/development.
- Continue research to initiate the development and acceptance of AAR interchange specifications/standards for an electrical power supply, electrical hand brake, and the subject eco-system platform.
- Continue research to promote development of a draft performance specification template for AAR review.

- Continue research to optimize the controller/motor interface design and efficiency and implement an improved means for feedback of chain load for communications and control of application and release functions.

Expected Outcomes:

- Research, development, and technology transfer of components and systems that reduce the risk of rail incidents and accidents and increase the safety of the nation's rail transportation network.
- Reduce the likelihood of derailments from equipment failures and mitigate the consequences should derailments occur through these or other causes. Strategic priorities include investigation of the effectiveness of wayside and onboard monitoring systems to detect equipment defects and analysis of component failure modes to identify necessary improvements in materials and construction methods.
- Design, develop, and demonstrate prototypes of effective wayside and onboard technologies that can provide component health monitoring.
- Increased understanding of equipment failure mechanisms and facilitate mitigation to reduce public safety risks.

RSEC - Rolling Stock Maintenance & Inspection

The focus of this research is to evaluate and demonstrate the effectiveness and efficiency of automated inspection and maintenance procedures and equipment. Demonstrate the ability to develop, monitor, control, and evaluate integrated advanced components to detect defects in real-time, predict and prevent future failures, improve rolling stock capabilities and performance, and improve overall rail operational safety. Develop a system for powering many advanced detection devices on freight trains will increase safety and security and improve the efficiency of freight railroad operations. Technologies developed to detect defects on rolling stock equipment, and predict future failures that may be prevented, will substantially improve railroad safety. These investments keep the U.S. rail sector growing and improving to keep up with the latest efficiency and safety standards.

Benefits of this research include improved safety requirements, lower operating costs for railroads, reduced railroad accidents and fatalities, improved equipment service life for equipment, and increased safety, security and efficiency of freight railroad operations.

Activities:

- Continue research to capture best practices with pilot demonstrations of wayside technology systems to detect defects and precursors to safety critical defects in railroad rolling stock.
- Continue research to document wayside system installations at MNR, LIRR and NYA, detect threshold analysis to help the railroads establish detection thresholds for inspection, alarm emergency level actions balanced against the shop capacity and commuter service demands, identify best practices for implementation, and revise the Wayside Implementation Guide.
- Continue research to investigate the current state of train line system, assist involved organizations with development of DTL, and explore wireless extension to DTL.

- Continue research to work closely with the Next Generation Equipment Committee, Association of American Railroads, American Association of State Highway and Transportation Officials, and Amtrak, among others.

Expected Outcomes:

- Detailed analysis of broken axles trends and causes, and recommendation to eliminate or mitigate their hazards.

RSEC - Train Handling & Operating Practices

This research will develop simulation scenarios to evaluate different network and capacity related parameters and compare these to the conventional signaling and braking applications. Simulation scenarios include network topology, traffic type, and various scenarios.

This research will also focus on developing effective methodologies/models for evaluating the economic benefits of improving railroad network velocity and capacity. These tools will be critical in demonstrating the benefits of advanced technologies, higher speed operations, and shared corridors.

This research includes a Very Long Trains (VLT) Study in collaboration with industry stakeholders – Evaluation and Risk Reduction Through Improved Train Makeup and Train Handling of Very Long Trains

- Support and provide responses to the Government Accountability Office's (GAO) questions on FRA's VLT related research efforts.
- Conduct air brake simulations to develop test scenarios for rack test plans of VLT configurations at a vendor's rack.
- Develop Air Brake Tests plan for testing at a major air brake system vendor facility with 250-Car rack.
- Establish a collaborative VLT study effort and air brake test program with industry stakeholders, including AAR, air brake system vendors, and the Brake System Committee.

Impact on quality, timeliness, effectiveness, efficiency and/or cost savings

- Assessment of emerging long trains operational safety.
- Investigation of long train operations and train handling on crew efficiency and fatigue.
- Potential train handling options for extra-long and heavy trains.

Activities:

- Conduct research on a roadmap for next generation brake technology and development of a "mini-network" with representative characteristics of the North American rail system, including various types of traffic, tracks, signaling systems, and train configurations in North America's network.
- Develop network simulation scenarios based on adjusting train braking algorithms with certain daily traffic volume out of the entire network.
- Conduct a comprehensive analysis of the simulated results in terms of network capacity parameters such as train delay, dwell time, train conflicts, train speed, network velocity, track occupancy level, number of meet-pass and stops, safety, and accident mitigation.

- Develop the necessary technology to analyze the topology of railroad networks to quantify, assess and enhance their resilience and improve its safety, productivity and cost effectiveness.

Expected Outcomes:

- Continue to improve the network topology to have the topological structure to offer robustness, resiliency, efficiency and effectiveness. Enhancing the network to meet the current increasing challenges.
- Continue to improve passenger truck designs that can provide superior equalization and curving performance to better handle rough track geometry.
- Evaluate advanced bearing technology and testing that prevents water related failures due to various environmental exposure.

Train Occupant Protection (TOP)

Research in this area will develop improved strategies and designs for rail rolling stock to reduce injuries and fatalities resulting from rail accidents (i.e., collisions and derailments).

TOP – Locomotive Crashworthiness and Occupant Protection

FRA continues to invest in this research to support its missions of improved safety, performance, and mitigation of the consequences of collisions and derailments that cause injury and loss of life. Crashworthiness and occupant protection continue to be major safety issues as evidenced by several high-profile collisions and derailments that occurred over the last decade.

Activities:

- Develop strategies for improved passenger railcar occupant protection including the conduct of full-scale testing to develop data to corroborate the current FRA regulations related to the crash pulse used to evaluate attachment strength of railcar components.
- Assess the deceleration environment to which passenger car occupants in wheeled mobility devices (WhMDs) are exposed and efficacy of various means to secure these devices in passenger trains. Results from full-scale testing analytical models validated with those results will be leveraged to evaluate safety performance under conditions for which actual testing was not performed.
- Use novel collision analyses and simulation techniques along with collision evaluation criteria to objectively assess the adequacy or potential shortcoming of the modern locomotive existing crashworthiness requirements.

Expected Outcomes:

- Improving the crash energy management (CEM) capabilities of existing (in-service) passenger and critical hazmat equipment, through cost-effective adaptations and retrofit technology.
- The re-evaluation activities described above will take advantage of more sophisticated modelling capabilities which exist and apply them to the structural analyses of alternative passenger equipment designs. Outcomes will be technical data which can be leveraged to inform potential improvements to existing safety standards.

- Improving rail safety as well as the railroad operational efficiency.
- Results from train-to-train test will be used to inform possible development of revised regulations or industry standards related to locomotive crashworthiness and standards for containment strategies for occupants in wheeled mobility devices to reduce the severity of the secondary impact velocity to which they are exposed in collision accidents.
- Provide results of testing of "legacy" locomotive collision post retrofit to industry to foster adoption of the approach to improved locomotive crashworthiness.
- Provide results from passenger car side structure engineering analyses to FRA Office of Railroad Safety as its response to the NTSB recommendation on this matter.

TOP – Glazing Standards

In the last 44 years, at least 25 fatalities have been attributed to ejection through rail car window openings during passenger train accidents. The research in this area will comprehensively describe all the engineering requirements placed on glazing systems, survey existing glazing systems design strategies used throughout the world, and assess the effectiveness of these designs in meeting all of the engineering requirements. In addition to functioning as a window, glazing systems are also expected to be impact resistant, provide emergency egress, provide emergency access, be fire resistant, and provide occupant containment.

FRA needs to invest in this research as it has the responsibility for conceptualizing and demonstrating the effectiveness of technology solutions that improve safety and where safety regulations may or may not already exist.

Activities:

- Continue research to develop realistic test protocols and evaluation metrics for glazing retention capacity.
- Continue research to inform potential Federal regulations or industry APTA standards related to glazing integrity as recommended by NTSB as a result of its investigations of recent passenger train accidents.
- Continue research to aggregate industry recommendations for passenger car design alternatives.
- Continue research to develop secondary impact protection for locomotive engineers and develop findings for consideration in the design of new or retrofitted locomotive cabs.

Expected Outcomes:

- Final draft of proposed APTA safety standard for improved glazing retention capacity.

TOP – Fire Safety Research

The Fire Safety Research program will focus on improving current Federal regulations and industry standards for crashworthiness of passenger locomotive fuel tanks, fire performance of materials and components used in passenger rail equipment through research activities. Modern, innovative, alternative methods for evaluating fire performance of materials and components will improve safety, yield cost-savings opportunities, and advancement of modern tools for the passenger rail sector. The FRA requirements for materials fire safety performance

and fuel tank crashworthiness were developed over 20 years ago. Passenger locomotive fuel tank structural requirements are based on static loading. Research into the performance of passenger locomotive fuel tanks under dynamic loads such as those seen in derailments and collisions is needed. Smaller profile diesel multiple unit (DMU) fuel tanks, which are not like those in a traditional passenger locomotive, are being assessed for their ability to perform under these loads as well. The research allows the FRA to not only evaluate conventional and DMU fuel tanks under dynamic loads, it also validates test methods that can be for evaluation of these types of equipment. This research allows FRA to review the current requirements for equivalency with newer standards, possibly allowing for the application of newer industry standards, promoting innovation and safety.

Activities:

- Conduct small-scale tests of various passenger rail car designs to evaluate the efficacy of smaller scaled test articles to predict performance of full-size rail car for floor fire compliance testing, evaluate test layout and support of test article and to support update of industry standards.
- Conduct small scale tests to validate computer modeling and scaling laws to determine and quantify heat release rate (HRR) for passenger rail cars.

Expected Outcomes:

- Validated scaling laws for modeling and simulation of rail car fire growth predictions.
- List of toxicity measurement methods.
- Review international and domestic standards for fire safety, with the goal identifying synergy among the standards for improved compliance.
- Support development of complementary industry standards for passenger locomotive fuel tank crashworthiness.

TOP – Emergency Preparedness Research

Emergency Preparedness standards set forth the basic minimum requirement for communication and safe evacuation of passengers and crew in emergency situations. Understanding the dynamics of passenger interaction as evacuation ensues on a passenger train will provide FRA with quantitation data to make decisions for improving the current standards. This project will investigate and develop innovative safety technologies that improve emergency preparedness and egress features of passenger rail equipment. The Emergency Preparedness Research program supports initiatives that ensure passenger rail equipment and onboard crewmembers' training is modern, progressive, and effective. It also supports providing vital safety information in a central location for all interested parties; this includes producing training videos and distributing it among related stakeholders and on the FRA website.

Activities:

- Evaluate technologies for safe and efficient evacuation of rail passengers under emergency scenarios.
- Gather and integrate rail passenger evacuation data into the egress models to better predict passenger evacuation.

- Update evacuation models coupled with fire dynamics models to include the effect fire suppression and detection systems technologies would have on passenger evacuation.
- Continue research to develop an underlying methodology for analyzing the topology of railroad networks, mainly to study and improve the ability of the railroad networks to offer robustness, resiliency, efficiency, and effectiveness.

Expected Outcomes:

- Evaluate evacuation scenarios in coupled fire dynamics-egress models
- A training video to be distributed to the public and emergency responders on how to locate and use ENS sign information. The format of the video should follow the same method as used for the rail safety videos. The video shall contain an overall safety message and details of the ENS signs.

Energy Products Research

In September 2021, FRA hosted the virtual "North American Workshops on Advancement of Safe, Clean Fuels and Motive Power for Rail Rolling Stock" to discuss rail application of clean fuel technologies, enhancing environmental protection, and improving environmental justice to affected communities. This workshop presented an opportunity for participants to share information and perspectives relating to the advancement of rail alternative energy technologies and carbon emission reduction. FRA intends to hold similar sessions in FY 2022 and FY 2023.

Activities:

- Assess the operational safety risks associated with hazardous material unit trains and determine if unit train operation of hazardous materials presents unique or additional risks compared with unit train operations of non-hazardous materials or mixed-freight operations involving the same hazardous materials as currently or planned for transportation in unit trains.
- Develop a risk model for quantifying risks associated with the operation of hazardous material unit trains and on risk mitigation.
- Continue to research Fire Performance of Alternative Fuel Tenders, Risk Analysis and Mitigation, and Rapid Brake Signal Propagation on Freight Trains.
- Provide data to help evaluate the survivability of the valve functions or gas flow under certain grade crossing accident conditions.

Expected Outcomes:

- Promote and support the development of safe, efficient and reliable clean fuels and motive power for rail transportation.
- Research the development and demonstration of safe and reliable technologies that reduce emissions of rail transportation.

Partnerships and stakeholder engagement form the foundation of RD&T's technology transfer methodology leading to the adoption of research products. The Rolling Stock Research Program is subject to continuous input and review from industry stakeholders. FRA staff are active contributors to industry committees and meetings overseen by the AAR, APTA, American Society of Mechanical Engineers (ASME), and others. Input from industry

stakeholders at these meetings is solicited and appropriately addressed in on-going research efforts.

TRAIN CONTROL AND COMMUNICATION PROGRAM

The FY 2023 Request includes $9.09 million for FRA's Train Control and Communication (TC&C) Research Program.

The number of signal-related train accidents has decreased by 18 percent from 2011 to 2020. Further reduction is expected from the installation of Positive Train Control (PTC) on certain routes, as PTC is one of the most transformative technological changes in the history of railroad signal technologies.

The TC&C Research Program focuses on improving railroad operation safety through the development and testing of train control and communication systems and grade crossing safety technologies. TC&C funds research to establish interoperable PTC performance standards and specifications for railroads to adopt and maintain and for suppliers to follow when designing PTC safety systems. The program conducts applied research to test safety systems and demonstrate concepts of operations to improve railroad operational safety. The program conducts pilot studies, creates prototypes, and demonstrates safety and security systems, including intelligent rail systems, and trespass prevention.

FRA's TC&C Research Program is aimed at reducing train-to-train collisions and train collisions with objects on the line and at grade crossings by:

- Assisting railroads in meeting PTC goals while maintaining safe and efficient rail operations. As a critical safety system, PTC must be highly reliable, interoperable, and secure.
- Working with railroads to define interoperable standards and system performance requirements. Developing and testing next generation PTC technologies to improve operational safety, maintain a high level of availability, and improve capacity. Integrating existing and new technologies to enable various levels Automated Train Operations (ATO).
- Developing safety application for Connected Vehicles (CV) to prevent vehicle-train collisions at railroad crossings.
- Developing, testing, and validating methods and means to reduce the number of casualties due to trespass activities.
- Developing technologies and tools to decrease accidents involving injuries and deaths at grade crossings.
- Simulating and modeling non-invasive and non-destructive methods to predict traffic trends and accident reduction in a controlled environment.
- Creating education and awareness tools to increase public understanding and awareness of the risks involved when near railroad property to help decrease incidents and accidents.

Strategic collaboration partners for the TC&C include FRA's Office of Railroad Safety, the Intelligent Transportation Systems Joint Program Office (ITS-JPO), the Federal Highway Administration (FHWA), the AAR, multiple railroads, local DOTs and police departments.

The Train Control and Communication research activity has innovated PTC-related technologies for several years. Notable successes include:

- Freight and Passenger Braking Algorithm development and refinement to improve braking enforcement performance for passenger railroads.
- Cybersecurity protection and PTC communications messaging verification and validation.
- Rail Crossing Violation Warning Application Development, a cooperative vehicle and infrastructure system that assists drivers in avoiding crash-imminent situations at railroad crossings.
- Automated and autonomous vehicle research to develop interoperability standards and improve grade crossing safety.
- Strategic rail industry spectrum needs assessments and spectrum acquisition planning.
- Built PTC and wireless communications test beds at Transportation Technology Center to be used by both large and small railroads.
- Developed a PTC Track Data Auditing System and associated interoperable standards and protocols to improve PTC reliability.

Anticipated FY 2022 accomplishments include:

- Conduct testing of enhanced track circuit technologies to increase safety and throughput, development of technologies to safely increase the capacity of freight and passenger trains through densely populated areas, and testing of improved PTC adaptive braking algorithms.
- Continue development of Interoperable Lifecycle Management (ILM) network and advance development of an interoperable track data auditing system.
- Identify and develop the methods, facilities, equipment, and capabilities required for providing future industry PTC development.
- Conduct applied automated train operation research and development, testing of an advanced head and end of train positioning system, standardization of new rail communication security techniques, and development of locomotive-based hazard sensing platform prototype.
- Develop requirements for a road remote control locomotive system.
- Evaluate continued development of automation technologies to improve grade crossing safety.
- Evaluate the effectiveness of connected vehicle technologies in a field environment and the development of rail industry-driven standards for communicating grade crossing status to connected or automated vehicles.
- Organize a public demonstration of connected vehicle technologies.
- Continue working on the effectiveness of mobile systems used for detection of trespassing activities within any given railroad, new work on AI applied to railroad trespassing, and developing new research ideas based on the input of stakeholders involved in trespassing issues.

- Work with universities, industry, railroads, and public sector in exploring new areas where technologies (such as PTC) and innovative devices can play a role in increasing safety at grade crossings. In addition, RD&T will develop and implement a grade crossing toolbox and a grade crossing data portal for use by relevant stakeholders.
- Explore new methods and techniques to improve pedestrian safety at rail grade crossings and continue to explore enforcement and educational tools to reduce accidents at grade crossings involving pedestrians.
- Develop new research ideas based on the outcome of the Trespass Summits planned and organized by the Office of Railroad Safety during FY 2022.

Train Control and Communication

PTC Technology

This research addresses problems associated with finalizing PTC development, deployment, and continued long-term evolution and maintenance. It supports the design and development of innovative systems to ensure PTC interoperability and reliability continue to evolve with the pace of technology development.

Activities:

- Support evolutionary and innovative technologies to ensure PTC interoperability and reliability continue to evolve with the pace of technology development.
- Coordinate with industry to develop solutions to improve reliability, availability, and maintainability of deployed PTC systems.
- Continue to improve rail network capacity and safety while reducing life cycle costs for railroads and streamlining regulatory compliance.

Expected Outcomes:

- Increased efficiency of PTC without reducing safety.
- Increased rail capacity and throughput.
- Increased braking accuracy for freight and passenger trains.

PTC Interoperability

Interoperability is the requirement that all railroads have the ability to work anywhere on the North American railroad network. If railroads are not interoperable, all rail traffic must stop and transition between carriers at each individual railroad boundary. This would be extremely inefficient, costly and create extreme burden on the FRA, railroads, passengers and freight railroad customers.

Interoperability is a requirement of the Rail Safety Improvement Act of 2008 (RSIA), as all railroads must have the ability to use the national network and transport goods and people on all lines. Multiple efforts are reviewed for viability, including radiofrequency spectrum allocation, infrastructure enhancements and modifications, and monitoring and analysis of the network. Interoperability will alleviate the regulatory burden requiring the FRA to check the interoperability between different railroads and will lead to development of an automated system that will ensure interoperability.

Activities:

- Continue interoperability research to ensure compliance with statutory requirements and assist industry in improving testing protocols and centralizing/streamlining testing and validation of PTC systems.
- Support the development of interoperable train automation technologies, hazard sensing solutions, and associated industry standards.

Expected Outcomes:

- Efficient and reliable interoperability controls between railroads.
- Automated interoperability verification between railroads.
- Automated file transfers between railroads to determine problem areas and corrections.
- Centralized test facilities that serve small freight and commuter railroads to streamline testing and validation of their PTC systems.

PTC Next Generation

This research will identify and develop the methods, facilities, equipment and capabilities required for providing future industry PTC development. Research will focus on providing additional functionality, improving reliability, and supporting integration with other technologies, all of which will support the objectives of improving safety and throughput. Multiple areas of consideration are under review for potential development, including signaling, communications, and infrastructure enhancements to reduce PTC burden and improve safety.

Activities:

- Develop signaling, communications, and infrastructure enhancements to reduce PTC burden and improve safety.
- Conduct research into advanced PTC concepts and architectures that support higher levels of railroad automation, such as Full Moving Block and Line of Road Remote Locomotive.

Expected Outcomes:

- Improved rail network capacity and decreased delays caused by PTC.
- Rail network safety and efficiency improvements through interoperable automation.
- Increased cyber security of PTC systems.

Intelligent Transportation Systems (ITS)

Facilitate collaboration between railroads and automotive industry stakeholders to develop coordinated solutions for automated transportation systems. Accelerated development of connected and autonomous road vehicles must be mirrored by railroad investment in rail automation and connected highway-rail grade crossing technologies.

RD&T's research of ITS improves 49 CFR Part 234 Grade Crossing Safety and Part 924 Highway Safety Improvement Program. Most of the highway-grade crossing regulations, especially those pertaining to the interactions of highway users, fall under FHWA or the Federal Motor Carriers Safety Administration (FMCSA). The regulations that FRA puts forth

on highway-grade crossing, in general, pertain to the requirements that the railroads must maintain regarding the safety devices and general upkeep of the highway-rail grade crossing. However, as the auto industry is pursuing autonomous vehicles, those vehicles will need to interact with highway-rail grade crossings and research needs to be conducted. Odds are that the current highway-rail grade crossing safety system will need to be altered to better communicate with autonomous vehicles so that the vehicles are "informed" of the position of the gates as well as informed about oncoming trains. A potential benefit that could come from the inclusion of autonomous vehicles at highway-rail grade crossings is the reduction of accidents caused by highway drivers moving around safety devices or by highway drivers misjudging the distance of an oncoming train and continuing to move through the crossing.

Activities:

- Continue to conduct research on new sensor, computer, and digital communications for train control, braking systems, grade crossing, and defect detection; and new, innovative technologies in automation, AI, and unmanned aerial vehicles to improve safety and reduce incidents around railroad operations.
- Research feasibility of a vital connected vehicle communication protocol for rail grade crossing accident mitigation and the development of novel concepts for integrating road vehicle active safety systems into rail crossing infrastructure systems.

Expected Outcomes:

- Advancement of connected and automated vehicle technologies with a focus on grade crossing safety.
- Communication standards tightly coordinated between rail and automotive industry groups.

Grade Crossing Safety and Trespass Prevention

Grade Crossing Safety Research plays a vital role in reducing accidents and incidents around grade crossings, which has for decades been the rail industry's largest public safety concern. This research continues the collaboration with State DOTs, local authorities, and communities to study and implement innovative solutions to improve safety around grade crossings. This research takes advantage of advancement in drones and UAV technologies to detect and prevent trespassers. In an effort to enhance and verify the accuracy of FRA grade crossing inventory database, this research uses LiDAR technology to map grade crossing profiles including elevation to identify hump crossings and prevent accidents resulting from low ground clearance vehicles being stuck at crossings.

<u>Trespass Countermeasures</u>
Continue to work with stakeholders in developing new tools and technologies to address trespassing on railroad Right-of-ways (ROW).

Activities:

- Work with all relevant partners and stakeholder to research solutions that can be used in reducing trespass occurrences along railroad rights-of-way.

Expected Outcomes:

- The outcome of the research described at a high level above is then expected to be transferred to other stakeholders, such as railroads or local communities for further development and implementation, thus increasing public safety.

Grade Crossing Technology

Continue to work with universities, the industry, railroads and public sector in exploring new technologies geared toward innovative devices to increase safety at grade crossings.

Activities:

- Develop technologies and tools to improve warning devices and integrate grade crossing locations into mapping devices.

Expected Outcomes:

- With the wide introduction and implementation of PTC, its inclusion of a grade crossing warning system will increase overall public safety and at the same time reduce accountability and liability.
- Increased safety at grade crossings thanks to the increased awareness from those mapping providers that include grade crossings in their systems.
- New technologies and solutions are expected to be developed or tested for feasibility under this set of activities in this research area. Increased safety and reliability, along with a significant reduction in accountability and liability are expected.

Grade Crossing Pedestrian Safety

Continue to explore measures to address accidents at grade crossings and along railroad ROWs that involve pedestrians.

Activities:

- Continue to explore measures to address accidents at grade crossings and along railroad rights-of-way that involve pedestrians.
- Collaborate with industry partners in researching and testing new methods to reduce the risk of accidents where pedestrians are involved.

Expected Outcomes:

- TC&C expects to increase safety for pedestrians at crossings thanks to this research described at a high level above.

Grade Crossing Modeling and Simulation

Continue working on the new accident prediction and severity model for grade crossings, as well as developing models for studying behavior in general at grade crossings.

Activities:

- Continue to evaluate scenarios of possible safety improvements at grade crossings without the actual need to perform field testing.

- Collaborate with other DOT modes, universities, and other professional industry partners in developing new simulation models to further reduce risk of accidents and improve safety at grade crossings.

Expected Outcomes:

- New accident prediction and severity model will greatly assist state and local communities in better planning investments for either grade crossing improvements, closure or grade separation.
- Use of the simulation tools will allow to propose improvements in a non-destructive manner allowing for an increase in safety in an innovative way.

Grade Crossing and Trespass Outreach and Education

Education and awareness are the best tools to have the public understand and be aware of the risks involved when near a railroad property.

Activities:

- Continue to educate the general public to the dangers of grade crossings, in collaboration with Operation Lifesaver and other organizations.

Expected Outcomes:

- Increased safety overall in the railroad environment when interacting with grade crossing and trespass prevention.

Partnerships and stakeholder engagement form the foundation of RD&T's technology transfer methodology leading to the adoption of research products. Stakeholder input is a critical driver of TC&C's research planning. All the research and development activities conducted by the TC&C Research Program are done in partnership with government and non-government groups to target the research to solve rail transportation safety issues and needs. These partnerships benefit from technical and financial collaboration for a more efficient and effective research program. Multiple railroads are contributing in-kind support of the development of requirements, testing and providing technical guidance and intellectual resources.

HUMAN FACTORS PROGRAM

The FY 2023 Request includes $6.79 million for FRA's Human Factors (HF) Research Program.

Human error continues to be one of the primary causes of railroad accidents and incidents. The HF program provides guidance on how to integrate new technologies in a holistic way. New systems are added one on top of another and may operate independently of each other. This creates challenges for railroad employees in making sense of the information they need to complete their tasks. For example, the locomotive engineer must contend with several technologies that impact train control but were developed for separate purposes.

Because of the greater interdependence between system components, it also raises the potential for failures that cascade throughout the entire railroad system.

The HF research program provides the rail industry with knowledge about human behavior in operational settings, and research yielding human requirements for better design of technology and processes. Human factors concepts, behavioral models, and research-derived tools are applied in research settings to define and understand human behavior related to safety issues.

The HF research program manages the Cab Technology Integration Laboratory (CTIL), which provides FRA and the rail industry the capability to examine the effect of human-machine teaming, train controls, new and more meaningful displays and different operating procedures on human and system performance. CTIL also provides a system development test and prototyping capability in a virtual environment more suitable for new system concepts, where there is less risk, before moving on to an operational testing environment.

The HF Research Program is focused on optimizing human performance in operations, improving railroad safety, and reducing rail accidents caused by human error by:

- Encouraging the development of a positive safety culture within the railroad industry.
- Developing interventions to mitigate fatigue and the effect of irregular work hours, as well as the unpredictability of on-duty times associated with the U.S. rail industry.
- Examining the individual and contextual factors associated with railroad work to identify those that have significant impacts on job performance and safety.
- Suggesting strategies to enhance safety and job performance.
- Understanding ways to improve the situational awareness of operating personnel that could improve vigilance and sustained attention.
- Applying simulation and modeling tools to address crew attentiveness and situational awareness issues, as well as the design of system safety technology, like PTC.
- Providing program oversight to the Short Line Safety Institute, which helps improve safety and safety culture in Class II and Class III railroads.
- Developing technologies and tools to understand human behavior at grade crossings.
- Creating education and awareness tools to increase public understanding and awareness of the risks involved when near railroad property to help decrease incidents and accidents.
- Conducting applied research and identifying and studying the causal factors that lead to trespassing and suicides incidents on railroad property.

Strategic collaboration partners for the Human Factors Program include FRA's Office of Railroad Safety, ASLRRA, AAR, Labor Unions, Operation Lifesaver, and other rail safety organizations.

Anticipated FY 2022 accomplishments for the FRA's Human Factors R&D program include:

- Evaluate safety issues associated with rail technology assessment and human performance, new technology concept demonstration and the human-machine interface

(HMI), and Human-Systems Integration (HSI) as an acquisition and implementation process for new technology.

- Provide support for the demonstration and evaluation of new and existing technologies that railroads are adopting with partners such as industry, Amtrak, and the Office of Railroad Safety.
- Provide general technical advice on human factors safety issues associated with the testing and evaluation of new rail equipment.
- Examine testing and evaluation planning regarding the inclusion of human performance in the equipment test loop at TTC.
- Maintain and operate the CTIL simulator as well as the driving simulator (shared with the National Highway Traffic Safety Administration) which includes conducting human subjects research, furnishing expert advice on experimental methodology, and promoting its use and applicability to other government and rail organizations.
- Update the CTIL website to enhance strategic communications and outreach (e.g., communicating the latest research activities to the public, recent technical reports and briefings related to automation research, and meeting notes from stakeholder review panels).
- Continue to provide oversight of the Short Line Safety Institute's programmatic activities, including program evaluation work conducted by Volpe.
- Work with the Short Line Safety Institute to pilot test the Confidential Close Call Reporting System (C3RS) Peer Review Team (PRT) support services for Class II and Class III railroads.
- Identify stakeholders' safety concerns regarding the operation of trains longer than 7,500 feet (very long trains or VLT) and work with other divisions in RD&T to develop a comprehensive research plan on very long trains (VLTs) using a systems perspective.
- Publish a Fatigue Research Plan that will describe the HF Division's comprehensive fatigue research efforts, conduct studies and analysis on human fatigue, and develop research-based recommendations on detection of human fatigue, countermeasures, and implications for railroad scheduling policy.
- Collaborate with the Office of Railroad Safety to develop a program of research related to employee training and identify knowledge gaps in the standard of training required for engineers and conductors to sufficiently operate new technology across different terrain and territory.
- Continue research, in collaboration with RD&T's Track Division, to describe the possible roles that humans and automation can each play in detection, analysis, and decision-making as well as considerations for how to effectively assign those roles depending on the level of automation or capabilities of the technology.
- Continue to partner with RRS to further its ongoing research and education activities to raise awareness of the dangers and impacts of trespassing, to seek out low-cost solutions to local trespassing issues, and to discuss practicable ideas for technological improvements at grade crossings. In this work, RD&T will continue to demonstrate its alignment with the *National Strategy to Prevent Trespassing on Railroad Property*.
- Conduct research to better understand the root causes of rail suicide and trespass incidents to develop strategies to prevent future incidents or mitigate their consequences.

- Work directly with at least one railroad carrier to collect detailed post-incident data, with a focus on data that indicates the intent of the individual involved in a train-person collision.

Human Factors (HF)

Railroad Technology, Automation, and Systems Design

New technologies are changing how railroad workers perform their jobs. This research area examines the safety implications of new technology and automation from a human-centered design perspective. The primary goal of this research area is to ensure that safety is enhanced, and not degraded, by new technology and automation. Prototypes may be designed and tested to benchmark the unintended human factors consequences of new technologies.

This project area researches safety issues associated with rail technology assessment and human performance, new technology concept demonstration and the human-machine interface, and human-systems integration as an acquisition and implementation process for new technology.

Activities:

- Continue research to catalog and survey the various Cautions, Alerts, Warnings, and Status (CAWS) associated with rail automated systems and displayed to engineers and operators.
- Continue operation and maintenance of CTIL simulator, including human subjects research, furnishing expert advice on experimental methodology, and promoting its applicability. Further, the division will continue to explore partnerships with labor, railroads, and academia in leading edge research on new HMI technology and systems engineering.
- Update the CTIL website, communicating to the public the latest activities and research accomplished in FRA's CTIL.

Expected Outcomes:

- Enhanced locomotive crew vehicle and operating environment situational awareness precursor for accident prevention.
- Developed HMI producing reduced workload, ease of use, and improved operational performance as impacts safety.

Railroad Worker and Operator Performance

Individuals and groups of workers perform safety critical jobs in the railroad industry under a variety of personal (age, sleep deprivation, motivation, memory, etc.), environmental (noise, temperature, vibration, etc.), and social (status, role, etc.) conditions that may affect job performance and safety. This Research Area examines these factors to identify those that have significant impacts on job performance and safety and to suggest strategies to enhance safety and job performance.

Activities:

- Work with stakeholders to continue to refine studies, develop tools, and share best practices and strategies to support human fatigue detection and countermeasures.
- Work with FRA's Office of Railroad Safety to assist with 49 CFR Part 243 oversight.
- Support the Human-Automation Teaming in Track Inspection to better describe the possible roles that humans and automation can each play in detection, analysis, and decision-making as well as considerations for how to effectively assign those depending on the level of automation or capabilities of the technology.

Expected Outcomes:

- Informed industry on physiological basis of fatigue and how human fatigue is measured or assessed.
- Improved railroad worker safety.

Railroad Organizational Culture and Safety Performance

This Research Area focuses on projects that enhance railroad safety by encouraging the development of a positive safety culture within the railroad industry. Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety, and by confidence in the efficacy of preventive measures.

Activities:

- Continue to support the Short Line Safety Institute's safety culture assessments (SCAs) and provide leadership training curriculum for Class II and III railroads.
- FRA is also planning to initiate two program evaluations under the R&D program in FY 2023. FRA plans to evaluate the C^3RS program and FRA-funded activities of the Short Line Safety Institute to determine their effectiveness and impact on railroad safety.
- Support the Office of Railroad Safety by providing subject matter expert consultation, research, data, and tools to improve railroad safety and reduce accidents and incidents. Activities include the ongoing developing and pilot testing of the Rail Information Sharing Environment (RISE) and collaboration with railroad safety working groups, including the Fatality Analysis of Maintenance-of-way Employees and Signalmen (FAMES) and the Switching Operations Fatality Analysis (SOFA) working group.

Expected Outcomes:

- Technical Reports, Research Results reports, and presentations to FRA stakeholders.

Highway-Rail Grade Crossings, Railroad Trespass, and Suicide Prevention

This research area examines the human factors that have significant impacts on grade crossing behavior and safety. Based on the research, RD&T suggests strategies to enhance safety and performance. This research area also explores the two leading causes of rail-related death in the U.S., trespassing and suicide.

Activities:

- Collaborate with the Office of Railroad Safety to conduct trespass prevention outreach activities.
- Continue railroad-specific analysis and work directly with at least one railroad carrier to collect detailed post-incident data, with a focus on data that indicates the intent of the individual involved in a train-person collision and assist railroad partners to identify ways to use data to effectively identify mitigation strategies.
- Coordinate with international colleagues through the Global Railway Alliance for Suicide Prevention (GRASP) and work to advance existing efforts to encourage responsible reporting about suicide and trespass incidents in the media, working with Operation Lifesaver and other organizations to better understand how to improve public discussion of railroad suicide incidents.
- Continue to support a suicide and trespass prevention group with U.S. rail carriers. Use lessons learned from this working group to expand research, intervention, and implementation activities.
- Continue conducting research to better understand the root cause of rail suicide and trespass incidents to develop strategies to prevent future incidents or mitigate their consequences.

Expected Outcomes:

- Technical Reports, Research Results reports, and presentations to stakeholders.

RAILROAD SYSTEMS ISSUES PROGRAM

The FY 2023 Request includes $19.77 million for FRA's Railroad System Issues (RSI) Program. A small portion of this funding is for staff to oversee contractors' and grantees' performance and to witness testing, including travel.

FRA's Railroad System Issues Program improves railroad safety by evaluating risks and prioritizing RD&T projects to reduce safety risk and achieve DOT, Office of the Assistant Secretary for Research and Technology (OST-R), and FRA goals. Railroad System Issues objective is to determine strategic research needs and priorities through collaboration with internal and external partners and stakeholders, considering real time safety issues requiring subject matter expertise or long-term research solutions.

A major focus of the RSI program is advancing research, development, and testing of clean fuels and more energy efficient rail propulsion technologies that will reduce the transportation sector's greenhouse gas emissions.

Strategic collaboration partners for the RSI Program include FRA's Office of Railroad Safety, ASLRRA, AAR, multiple railroads and universities.

Anticipated FY 2022 accomplishments for the Railroad Systems Issues program include:

- Develop new research and complete existing research to deliver innovative solutions to improve safety and performance in railroad systems through Rail Safety Innovations Deserving Exploratory Analysis (IDEA) program.
- Improve research project evaluation and technology transfer reporting.
- Increase information sharing, partnerships, and utilization of the TTC.
- Emphasize expanding initiatives and programming to address diversity, equity, and inclusion within the railroad industry, with regards to its future pipeline of talent, by:
    - Enhancing railroad stakeholder engagement and information sharing to improve FRA's research and understanding of trends,
    - Increasing general awareness and interest in rail-related opportunities and careers among youth and college graduates,
    - Improving the number of underrepresented people in rail jobs industry wide – and ultimately more diverse individuals rising into leadership positions across the industry,
    - Identifying additional areas of research and new topics for exploration to continue progressing the inclusiveness and equity across the rail industry,
    - Engaging communities in the industry's efforts to build a pipeline of diverse, qualified talent for the railroad industry, including increasing the percent of women employed in the railroad industry, and
    - Increasing federal funding opportunities to Minority-Serving Institutions.
- Develop a robust research strategic plan focused on assessing the safety and efficacy of technologies for the decarbonization and improvement of rail transportation.
- Establish research cooperative partnerships to further the development of rail energy and emissions technologies, including further development of Rail Module in the GREET (Greenhouse gases Regulated Emissions and Energy use in Transportation) Model to provide the rail industry with a multi-modal tool that can be used to assess emissions and energy use of different fuel pathways.
- Work with U.S. Access Board and the rail industry to develop guidance for securement of wheeled mobility devices on-board passenger rail car.
- Investigate innovative locomotive engine technologies to ensure the safe and efficient transportation of people and goods.
- Provide the Office of Railroad Safety with improved science to drive standards and requirements development, and support compliance of emissions limits for both passenger and freight equipment.
- Continue partnerships to support universities, particularly on Intelligent Railroad Systems (IRS). The continued research projects focus on advanced technology, automation, and connected vehicle technologies; advancing technologies for rural application; and workforce development.
- Continue development and application of new technology at the TTC for Federal agencies and others involved in rail transportation.
- Enhance the capabilities of facilities and equipment by supporting and conducting high-speed testing; commissioning of new rail equipment such as transit, passenger, light and freight rail and locomotives; and refurbishing of the railroad system and components around the TTC.

Funding requested in FY 2023 will advance a number of initiatives under the Railroad Systems Issues Research Program, including new workforce development and energy emission research topics to address racial inequity in transportation and the climate crisis, respectively.

Railroad Systems Issues (RSI)

Workforce Development (WFD)
This research provides support and domain expertise in the areas of railroad WFD to adequately identify suitable approaches for both the management and capture of rail workforce-related trends. This research increases the awareness of railroad industry WFD issues by establishing and/or participating in forums and research efforts to foster and support industry collaboration. Expertise from the FRA R&D program will support the establishment of the proposed National Railroad Institute, and help to address equity, diversity, and access, by increasing engagement with minority serving institutions to encourage interest in transportation related jobs.

Activities:

- Continue forums with stakeholders for best practice and information exchange.
- Support the third phase of programs aimed toward engaging youth (PreK through 12th grade and college) and under-represented populations in rail transportation and Science, Technology, Engineering, and Math (STEM) topics.
- Expand strategic outreach to build research partnerships with Minority-Serving Institutions (MSI) and increase awareness and interest in railroad careers.
- Conduct research and publish updates to the railroad industry workforce assessment, Railroad Industry Modal Profile.
- Capture and analyze workforce data on trends, skill gaps, skill demands, training opportunities, industry best practices, and cross-modal efforts through surveys and industry dialogues.
- Engage and collaborate with the railroad industry for a better understanding of WFD trends, and relevant data and insights to support sustainable initiatives.
- Fund the second year of research topics Addressing Equity Challenges in Evolving Railroad Workforce Training Trends and Best Practices, Workforce Recruitment - Attracting and Retaining Women in Rail, and Influencing Successful Practices in Knowledge Management within the Railroad Industry.
- Continue to fund research proposals from the following research topics published in FRA'S Research with Universities - Research Initiatives in Support of Railroad Safety BAA: Precollege STEM Rail Transportation Club to increase Racial Equity in Rail Workforce Recruitment, Workforce Recruitment - Attracting and Retaining Women in Rail, Racial Equity in Rail Workforce Recruitment - Identifying and Training Leadership for Succession Planning, and LGBTQ+ Equity and Inclusion in the Railroad Industry.
- Continue partnerships with associations to create/support programs targeting underrepresented populations to encourage them to select railroad as a career.

- Continue public - private partnership for MSIs to work and conduct research with industry to encourage STEM learning and promote railroad as a career of choice.

Expected Outcomes:
- Research results of workforce development published.
- Continued stakeholder engagement.

Energy and Emissions Safety Research

In support of DOT priorities of safety and climate and sustainability, FRA undertakes research that will investigate the efficacy of clean fuels and advanced motive power technologies to improve energy efficiency and reduce emissions of rail transportation. This research area focuses on supporting activities related to real-world demonstration of clean fuels, technologies and improvements in standards for noise emissions to ensure their implementation on rail systems across the nation.

Research provides data in support of the safe operation and use of clean fuels, engine improvement, and motive power technologies. Newer innovative solutions for freight and passenger operations such as hydrogen, fuel cell, and battery technologies hold great potential for the U.S. rail market. Research on the structural requirements for liquid and gaseous hydrogen containers and their structural design is needed. Research on the safety of refueling/recharging infrastructure is needed. The efficacy of current federal regulations to address and ensure the safe use of such fuels will be analyzed and decisions made to adjust accordingly. The research provides FRA's Office of Railroad Safety with the scientific basis for decision-making and development of standards, regulations, and other requirements. FRA will collaborate with other federal agencies to ensure safe use of the energy products.

Activities:
- Cooperate with the Office of Railroad Safety to plan and execute a conference to include international participants on the advancement of safe, clean fuels, and motive power technologies for railroad applications.
- Continued impact study of hydrogen for rail applications.
- Collaborate within the railroad industry to identify standards and best practices for hydrogen fuel usage for rail applications.
- Maintain the Rail Module in the GREET model so that the tool is updated, relevant, and useful for rail industry.
- Provide feedback and direction to RRS on performance of such equipment under normal and accident scenarios.

Expected Outcomes:
- Identification of safety research needed to progress hydrogen and fuel cell technologies in U.S.
- Identification and demonstration of safe and reliable technologies that reduce emissions of rail transportation.

Rail Safety Innovations Deserving Exploratory Analysis (IDEA)

The Transportation Research Board (TRB) initiated this effort in conjunction with FRA to address safety needs within the railroad industry. The focus of this project is to solicit innovation, ideas and advanced technology in railroad safety. Each research effort selected has a unique timeframe, generally lasting one to two years.

Activities*:*

With multiple activities each year, the outcomes vary based on the selected projects and duration of research.

- Issue an IDEA Program Announcement to solicit proposals for the Rail Safety IDEA program exploratory research projects.
- Select a qualified Rail Safety IDEA review committee that will evaluate proposals on a competitive basis.
- Evaluate those proposals meeting the technical eligibility criteria and provide comments for selected researchers.
- TRB and FRA will collaborate to manage the projects to completion.

Expected Outcomes:

- Detailed Project Work Plan, Budget, and Schedule.
- Project Agreement between TRB and Sub-awardees (Consultants/Contractors).
- Quarterly Progress Reports (using the FRA QPR template).
- Final Performance Report that should describe the cumulative activities of the Project, including a complete description of the Grantee's achievements with respect to the Project objectives and milestones.
- Final Report for each selected project will be posted on TRB's website/publication.

Project Selection

RD&T utilizes a software package (Decision Lens Software) and the Safety Risk Model as part of the prioritization process. This project includes the activities and costs associated to maintaining the license for the prioritization software, optimizing the Safety Risk Model and executing the prioritization process. RD&T conducts prioritization activities to effectively manage its budget and ensure that stakeholder and industry needs are inputs to the investment planning process.

Activities:

- Maintain the license for the prioritization software and implementing the prioritization process.
- Renew the Decision Lens software license for an additional option year.
- Use lessons learned and apply improved rating process to candidate research projects for future efforts

Expected Outcomes:

- Robust FY 2024 research portfolio.
- Quantifiable project prioritization plan.

Project Evaluation

The focus of this project is to educate and train program managers (PMs) about project evaluation techniques, develop performance measures, improve project progress, and reduce cost. PMs and external parties will evaluate projects conducted by the five RD&T divisions to measure success, improve project performance and railroad safety. Project evaluation processes will help RD&T better manage funding.

Activities:

- Standardize and enhance project evaluation tools.
- Align evaluation practices to FRA's learning agenda and OMB's direction.

Expected Outcomes:

- Increased maturity of project evaluation practices.
- Standardized performance measurement.
- Standardized project evaluation.
- Established performance measurement baseline.

Accessibility

Investigate universal and inclusive designs for accessibility on-board passenger trains. FRA is in a unique position to collaborate with stakeholders (other Federal agencies, disability advocacy groups, passenger rail operators, and equipment manufacturer and industry groups) to ensure that new standards for accessibility are feasible and safe; balancing the requirements of the law with the capability of the equipment. Accessibility to our nation's rail stations and equipment is a civil right, and FRA research and industry partnership in this area help to advance transportation equity.

Activities:

- Support development of new and improved accessibility standards for rail vehicles ensuring that the standards are safe and technically feasible.
- Conduct research as needed to develop science-based knowledge in support of standards.

Expected Outcomes:

- Data on relative motion of wheeled mobility device and its occupant in non-contained spaces.

Locomotive Safety

The goal of this research is to investigate innovative locomotive engine technologies to ensure the safe and efficient transportation of goods and people. Areas of focus for this research program include reduction in fuel consumption, improvement in engine component life, and improvement in the efficiency of older, less efficient locomotives. Research is conducted in collaboration with Class I railroads to demonstrate and develop prototype systems. This research area addresses the DOT priorities of Safety and Climate and Sustainability.

Activities:

- Assess new and innovative technologies that will improve the safety and efficiency of locomotive in a real-world environment.
- Complete development and prototype demonstration of hybrid systems.

Expected Outcomes:

- Knowledge of the performance of locomotive engine systems to improve efficiency while maintaining safety.
- Ensure that emerging, innovative locomotive engine efficiency improvement technologies are safe.

Partnerships and stakeholder engagement form the foundation of RD&T's technology transfer methodology leading to the adoption of research products. As part of technology transfer efforts, RD&T staff engages with both internal and external stakeholders throughout the research and development life cycle. An integral part of engagement includes collaborating with stakeholders to understand research needs and safety issues. RD&T conducts prioritization activities to effectively manage its budget and ensure that stakeholder and industry needs are included in the RD&T investment planning process. DOT priorities and safety priorities, especially those provided by the FRA Office of Railroad Safety, are a major input into the process.

Office of Railroad Safety Support

All RD&T divisions support the Office of Railroad Safety by providing subject matter expertise consultation, research, data, and tools to improve railroad safety and reduce accidents and incidents. The Office of Railroad Safety works closely with RD&T to provide insight into research needs throughout the fiscal year. RD&T needs the ability to support requests for research and expertise for time sensitive safety issues.

Activities:

- Continue to partner with the Office of Railroad Safety and industry on the Rail Information Sharing Environment (RISE) pilot.
- Conduct research of urgent safety issues identified by the Office of Railroad Safety or Congress.
- Continue to provide subject matter expert support to the Office of Railroad Safety.

Expected Outcomes:

- Analysis of safety risks and identifying mitigations to those risks.
- Growth and maturity of RISE including industry involvement.

Note: This funding will come from multiple divisions to support their research.

Research with Universities

Research with Universities provides research opportunities to American academic institutions and this project attracts and funds proposals that have the potential of improving safety and performance in railroad systems in the following areas: track, rolling stock, train control &

communication, and human factors. This project will support university research on intelligent railroad systems. In addition, this project incorporates participation from railroad industry.

FRA will incorporate input that it receives from the railroad industry to determine research themes. These research themes will drive research topics. Research topics will be announced and reviewed, and the most promising proposals will be selected for funding.

All selected proposals have the ultimate goals of improving railroad safety and performance, enhancing the infrastructure conditions and services by stimulating economic growth, and productivity and workforce development.

Activities:

- Publish the request for proposals and review the university proposals.
- Select prospective research projects to fund and begin selected projects.

Expected Outcomes:
The expected outcomes align with DOT priorities and include projects that focus on:

- Advanced technology.
- Safe automation.
- Connected vehicle technologies.
- Projects that advance technologies for rural application.
- Clean energy research and safety.
- Workforce development.

<u>Transportation Technology Center – Research Facilities and Equipment</u>
The primary objective of this funding is to develop unique R&D infrastructure to accommodate the testing and evaluation of intelligent railroad systems technologies and to provide the FRA with the type and quality of facilities and equipment needed to meet its R&D mission. Focused on enhancing railroad safety, TTC drives national R&D and application of new technology for railways, suppliers, governments, and others involved in rail transportation. This funding supports RD&T Facilities and Equipment Programs, which enhance rail transportation technology development, testing, and standards development. Additional funds will be used to purchase heavy equipment necessary to maintain the physical track infrastructure and rolling stock, such as track maintenance equipment and heavy maintenance equipment. These funds would also be used to purchase instrumentation that supports FRA research.

Activities:

- Provide facilities and equipment that can perform railroad research and development, testing, and training to enhance the safety of rail systems in both safety and security operations.
- Continue the enhancement of TTC's capabilities through strategic investment to existing facilities and equipment to support upcoming research and testing needs.
- Continue the refurbishment of the rail system at the TTC.

- Support environmental and green technology goals encouraging energy efficiency, use of renewable energy, reduction of toxins, recycling, reuse of materials, and water conservation.
- Purchase equipment and instrumentation identified by a new RD&T facilities maintenance plan.
- Raise awareness and encourage broader use of TTC's facilities through creative outreach efforts to other Government agencies and the private sector, while ensuring priority for FRA-sponsored activities and providing fair access to TTC's facilities.

Expected Outcome:

- These activities support conducting rail transportation technology development, testing, training, and standards development.
- Rail stress and rail neutral temperature test bed at TTC.
- Test bed to validate the accuracy of track geometry measurement systems.

Transportation Technology Center – Facility Repair and Rehabilitation

Since its 1970s establishment on more than 33,000 acres near Pueblo, CO, FRA's Transportation Technology Center has been a vital resource in FRA's and the railroad community's pursuit of safer, more reliable, and more efficient rail services. As TTC has continued to deliver valuable research and training, demands on the physical infrastructure have grown. Thousands of people now participate each year in TTC research, testing, safety training and first responder training.

FRA manages the site through an on-site contractor, who conducts research using the facility and maintains the facility to support that research. Funding is requested in FY 2023 for needed investment associated with FRA's responsibility as the property owner. These projects are outside of the nature of investments made by the on-site contractor and/or through research activities. IIJA authorized up to $3 million annually under the R&D account to be used to erect, alter, and repair buildings and make other public improvements at TTC. FRA requested funding for these activities under the Safety and Operations account in the FY 2022 President's Budget, which preceded the enactment of IIJA. Proposed construction projects for FY 2023 include:

1. Fire and Life Safety – This funding would be used to address Occupational Safety and Health Administration compliance requirements for stairways and railings at seven buildings, install carbon monoxide and nitrogen oxides detection systems, and install fire protection systems. The planned buildings include: Center Services Building, Components Test Laboratory, FAST Service Facility, Operations Building, Passenger Rail Service Building, Rail Dynamics Laboratory, Transit Maintenance Building, Urban Rail Building, and Warehouse Laboratory Facility, as well as other support structures across TTC.
2. Accessibility and Egress – This funding would be used for accessibility projects to address compliance with the Architectural Barriers Act, including improving interior doorway and elevator accessibility, drinking fountains, and signage. The planned buildings include: Center Services Building, Components Test Laboratory, FAST Service Facility, FAST Office Modular Building, Operations Building, Passenger Rail Service

Building, Rail Dynamics Laboratory, Security & Emergency Response Training Center, Travel Maintenance Building, TTX Building, Urban Rail Building, and Warehouse Laboratory Facility, as well as other support structures across TTC.

3. Interior and Exterior Lighting – This funding would be used to replace 1970s lighting systems that have been used well past their expected useful live with new, energy efficient lighting. The planned buildings include: Butler Building, Components Test Laboratory, Cracked Axle Facility, CTA Rectifier Building, FAST Air Compressor Shed, FAST Office Modular Building, FAST Service Facility, FAST Tool Building, Fire Pump House, Flammable Storage Building, Linear Induction Motor Research Vehicle (LIMRV) Maintenance Building, Passenger Rail Service Building, Rail Dynamics Laboratory, Security & Emergency Response Training Center, Squeeze Fixture Facility, Stand-By Power Building, Travel Maintenance Building, Transit Maintenance Building, TTX Building, Tyco Cracked Wheel Facility, Urban Rail Building, and Warehouse Laboratory Facility, as well as other support structures across TTC.

Rail R&D Centers of Excellence

IIJA authorized a new initiative directing the Department to award grants to establish and maintain centers of excellence to advance research and development that improves the safety, efficiency, and reliability of passenger and freight rail transportation. These grants may be awarded to institutions of higher education or consortiums of nonprofit institutions of higher education.

Recipients can use grant funds for a wide variety of purposes, including basic and applied research, evaluation, education, workforce development, and training efforts. These efforts may be related to safety, project delivery, efficiency, reliability, resiliency, and sustainability of urban commuter, intercity high-speed, and freight rail transportation. IIJA specifically references the centers of excellence focusing on advances in rolling stock, advanced positive train control, human factors, rail infrastructure, shared corridors, grade crossing safety, inspection technology, remote sensing, rail systems maintenance, network resiliency, operational reliability, energy efficiency, and other advanced technologies.

What benefits will be provided to the American public through this request and why is this program necessary?

R&D must play a foundational role in addressing the transportation challenges facing the United States. In addition to helping continuously improve railroad safety and operating performance, modest investments in R&D can pay significant dividends as the Biden-Harris Administration and industry partners take an "all-hands on deck" approach to tackling the climate crisis. Investments made today through FRA's R&D program may one day be the key to building more resilient infrastructure, developing more energy efficient rail platforms, or identifying and nurturing the next generation of rail industry leaders.

As described previously, FRA's research, development, and technology projects provide tangible safety and operational benefits to the railroad industry. FRA's applied research efforts help to develop innovative solutions to challenges facing the rail industry and ensures that the best

available science and technology are the basis for FRA's safety regulatory actions, enforcement, and programs. FRA also develops technology that the rail industry can adopt voluntarily to improve safety. FRA conducts research, development, and technology initiatives independently and collaboratively to:

- Ensure safety is the paramount consideration in exploring new technologies and practices.
- Leverage public resources, disperse costs, and reduce or eliminate redundant efforts.
- Assess new concepts and technologies that the railroad industry is using.
- Promote industry adoption of promising research results.

RD&T also focuses on technology transfer through the lifecycle of its research with the goal to engage stakeholders, internal and external, and to increase industry adoption of RD&T's concepts, research, and methodologies that enhance safety and performance of the railroads. RD&T's research, technology transfer activities include:

- Adoption of Technology
- Industry Conferences, Working Groups, Meetings, Presentations/Demonstrations
- Joint Research Activities with Federal partners
- Stakeholder Meetings
- Research Publications and Reports

Research into tank cars will benefit the American public by reducing the spillage of hazardous material. FRA's R&D program will help protect people who live in neighborhoods through which trains operate and reduce the likelihood of environmental damage due to hazardous material releases. Two areas of research that help achieve this are (1) reducing failures such as broken wheels and rails that cause derailments and (2) improving the strength of tank cars to better survive derailments that do occur.

Safe rail transportation directly benefits the public traveling by train. FRA's R&D program will reduce train collisions by facilitating the implementation of new technologies such as PTC. It will reduce collision risks when passenger trains share the same corridors as freight trains. The program will lay the foundation for future safety actions and approaches that will reduce the likelihood of derailments. FRA's R&D program will also improve occupant protection in collisions and derailments.

By addressing the root causes of grade crossing accidents, FRA's R&D program improves the safety of the American public that needs to cross railroad rights-of-way. Human factors research into driver behavior at highway-rail grade crossings and the effectiveness of alternative warning systems helps identify optimum solutions. Developing new technologies for crossing protection and train to vehicle communications leads to reduced incidents of grade crossings being blocked, which can delay emergency responders.

FRA's R&D program helps to reduce fatalities and injuries to trespassers on railroad property. Members of the public are known to take shortcuts across railroad property. Innovative solutions for warning people of the danger they face need to be researched and implemented.

By funding universities to conduct R&D, FRA supports a pipeline of future rail expertise by providing opportunity for students to prepare for rewarding jobs in the railroad industry. The age profile for railroad industry employees shows a growing demand for new entrants.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

NATIONAL RAILROAD PASSENGER CORPORATION
APPROPRIATIONS LANGUAGE

NORTHEAST CORRIDOR GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION

To enable the Secretary of Transportation to make grants to the National Railroad Passenger Corporation for activities associated with the Northeast Corridor as authorized by [section 11101(a) of the Fixing America's Surface Transportation Act (division A of Public Law 114-94)] *section 22101(a) of division B of the Infrastructure Investment and Jobs Act (Public Law 117-58),* [$1,300,000,000]*$1,200,000,000*, to remain available until expended: Provided, That the Secretary may retain up to one-half of 1 percent of the funds provided under both this heading and the "National Network Grants to the National Railroad Passenger Corporation" heading to fund the costs of project management and oversight of activities authorized by [section 11101(c) of division A of Public Law 114-94]*section 22101(c) of division B of the Infrastructure Investment and Jobs Act (Public Law 117-58)*: Provided further, That [in addition to the project management oversight funds authorized under section 11101(c) of division A of Public Law 114-94, the Secretary may retain up to an additional $5,000,000 of the funds provided under this heading to fund expenses associated with the Northeast Corridor Commission established under section 24905 of title 49, United States Code: Provided further, That of the amounts made available under this heading and the "National Network Grants to the National Railroad Passenger Corporation" heading, not less than $75,000,000 shall be made available to bring Amtrak-served facilities and stations into compliance with the Americans with Disabilities Act: Provided further, That of the amounts made available under this heading and the "National Network Grants to the National Railroad Passenger Corporation" heading, not less than $150,000,000 shall be made available to fund the replacement of the single-level passenger cars used on the Northeast Corridor, State-supported routes, and long-distance routes, as such terms are defined in section 24102 of title 49, United States Code]*notwithstanding paragraphs (2) and (3) of section 24319(e) of title 49, United States Code, the Secretary shall make payments to Amtrak on a reimbursable basis for activities funded by grants under both this heading in this Act and the "National Network Grants to the National Railroad Passenger Corporation" heading in this Act that are defined in clauses (ii) through (v) of section 24319(c)(2)(C) and in section 24319(c)(2)(D): Provided further, That the Secretary may use an otherwise allowable approach to the payment method for the operations, services, programs, projects, and other activities identified in the previous proviso if the Secretary and Amtrak agree that a different payment method is necessary to successfully implement and report on an operation, service, program, project, or other activity*.

NATIONAL NETWORK GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION

To enable the Secretary of Transportation to make grants to the National Railroad Passenger Corporation for activities associated with the National Network as authorized by [section 11101(b) of the Fixing America's Surface Transportation Act (division A of Public Law 114-94)]*section 22101(b) of division B of the Infrastructure Investment and Jobs Act (division B of Public Law 117-58)*, [$1,400,000,000]*$1,800,000,000*, to remain available until expended: Provided, That [the Secretary may retain up to an additional $2,000,000 of the funds provided under this heading to fund expenses associated with the State-Supported Route Committee established under section 24712 of title 49, United States Code]*Amtrak may use up to $100,000,000 of the funds provided under this heading in this Act for corridor development activities authorized by section 22101(h) of division B of the Infrastructure Investment and Jobs Act (Public Law 117-58)*.

Explanation of Changes: The FY 2023 President's Budget updates Amtrak's appropriations language to reflect new references to the Infrastructure Investment and Jobs Act (IIJA) authorization. The language also removes specific reference to set-asides for the Northeast Corridor Commission, State-Supported Route Committee, and projects to bring Amtrak stations and facilities into compliance with the Americans with Disabilities Act. These set-asides are authorized by IIJA and FRA intends to use the fully authorized amounts and does not require appropriations language. The language also removes prior reference to a set-aside for Amtrak to replace single-level passenger rail cars, as this project is now fully-funded from the IIJA supplemental advance appropriation. The language also limits Amtrak to using $100 million of National Network funds for newly authorized corridor development activities, rather than the 10 percent authorized under IIJA. Finally, the language proposes certain capital projects be funded on a reimbursable basis, rather than via advanced payment.

EXHIBIT III-1
GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION
Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2021 ENACTED	FY 2022 CR	FY 2023 PRES. BUD.
Northeast Corridor Grants to Amtrak	$ 700,000	$ 700,000	$ 1,200,000
National Network Grants to Amtrak	$ 1,300,000	$ 1,300,000	$ 1,800,000
Transfer to Financial Assistance Oversight and Technical Assistance	$ -	$ -	$ (15,000)
TOTAL, Base appropriations	$ 2,000,000	$ 2,000,000	$ 2,985,000
FTEs			
Direct Funded[1]	15	13	0
Supplemental Funding			
COVID-19 Supplementals			
Northeast Corridor Grants to Amtrak	$ 1,625,819	$ -	$ -
National Network Grants to Amtrak	$ 1,074,181	$ -	$ -
IIJA Supplemental (Division J)			
Northeast Corridor Grants to Amtrak	$ -	$ 1,200,000	$ 1,200,000
National Network Grants to Amtrak	$ -	$ 3,200,000	$ 3,200,000
Transfer to Financial Assistance Oversight and Technical Assistance	$ -	$ (22,000)	$ (22,000)
TOTAL, Supplemental appropriations	$ 2,700,000	$ 4,378,000	$ 4,378,000
FTEs			
Direct Funded	0	0	0
TOTAL, Account	$ 4,700,000	$ 6,378,000	$ 7,363,000

[1] FRA FTEs previously funded from the Amtrak account will now be funded under the new Financial Assistance Oversight and Technical Assistance account in FY 2023.

Program and Performance Statement

FRA's Grants to Amtrak provide capital, operating, and debt service funding to Amtrak, as well as support FRA's management and oversight of Amtrak. These funds support Amtrak's three primary service lines – Northeast Corridor, State-Supported, and Long Distance – and costs associated with managing other passenger and freight rail operator access to Amtrak's infrastructure and Amtrak corporate operations. As authorized by statute, the Secretary may withhold up to $6 million from the Northeast Corridor account for the Northeast Corridor Commission, up to $3 million from the National Network account for the State-Supported Route Committee, up to $3 million from the National Network account for Interstate Rail Compacts grants, and at least $50 million from both the Northeast Corridor and National Network accounts for grants to Amtrak to make accessibility upgrades pursuant to the Americans with Disabilities Act. Amtrak may also use up to 10 percent of the amounts made available from the National Network account for planning, capital, and operating costs for Amtrak-operated corridors selected under the Corridor Identification and Development Program. Unless otherwise stated in appropriations language, FRA intends to use the fully authorized amounts for these set-asides.

EXHIBIT III-1a
FEDERAL RAILROAD ADMINISTRATION
GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION
SUMMARY ANALYSIS OF CHANGE FROM FY 2022 TO FY 2023
Appropriations, Obligations, Limitations, and Exempt Obligations
($000)

	$000	**FTE**
FY 2022 CR	$2,000,000	13
ADJUSTMENTS TO BASE:		
Annualization of Prior Pay Raise(s)	6	
FY 2023 Pay Raise	83	
Adjustment for Compensable Days	-9	
Inflation and Other	39,882	
SUBTOTAL, ADJUSTMENTS TO BASE	**39,961**	**0**
PROGRAM REDUCTIONS		
Salaries and Benefits	-2,549	-13
Travel	-150	
Other Contracts	-7,462	
SUBTOTAL, PROGRAM REDUCTIONS	**-10,161**	**-13**
PROGRAM INCREASES		
Northeast Corridor Grants to Amtrak	483,570	
National Network Grants to Amtrak	471,630	
SUBTOTAL, PROGRAM INCREASES	**955,200**	**0**
FY 2023 REQUEST	**2,985,000**	**0**
Supplemental Appropriations	**4,400,000**	**0**
Transfer to Financial Assistance Oversight and Technical Assistance	-22,000	
Net, Supplemental Appropriations	**4,378,000**	**0**
TOTAL	**7,363,000**	**0**

Detailed Justification for the Grants to the National Railroad Passenger Corporation

FY 2023 – Grants to the National Railroad Passenger Corporation – Budget Request ($000)

Program Activity	FY 2021 Enacted	FY 2022 Continuing Resolution	FY 2023 President's Budget
Northeast Corridor Grants to the National Railroad Passenger Corporation	$700,000	$700,000	$1,200,000
National Network Grants to the National Railroad Passenger Corporation	$1,300,000	$1,300,000	$1,800,000
Total	**$2,000,000**	**$2,000,000**	**$3,000,000**
FTE	**15**	**13**	**0**

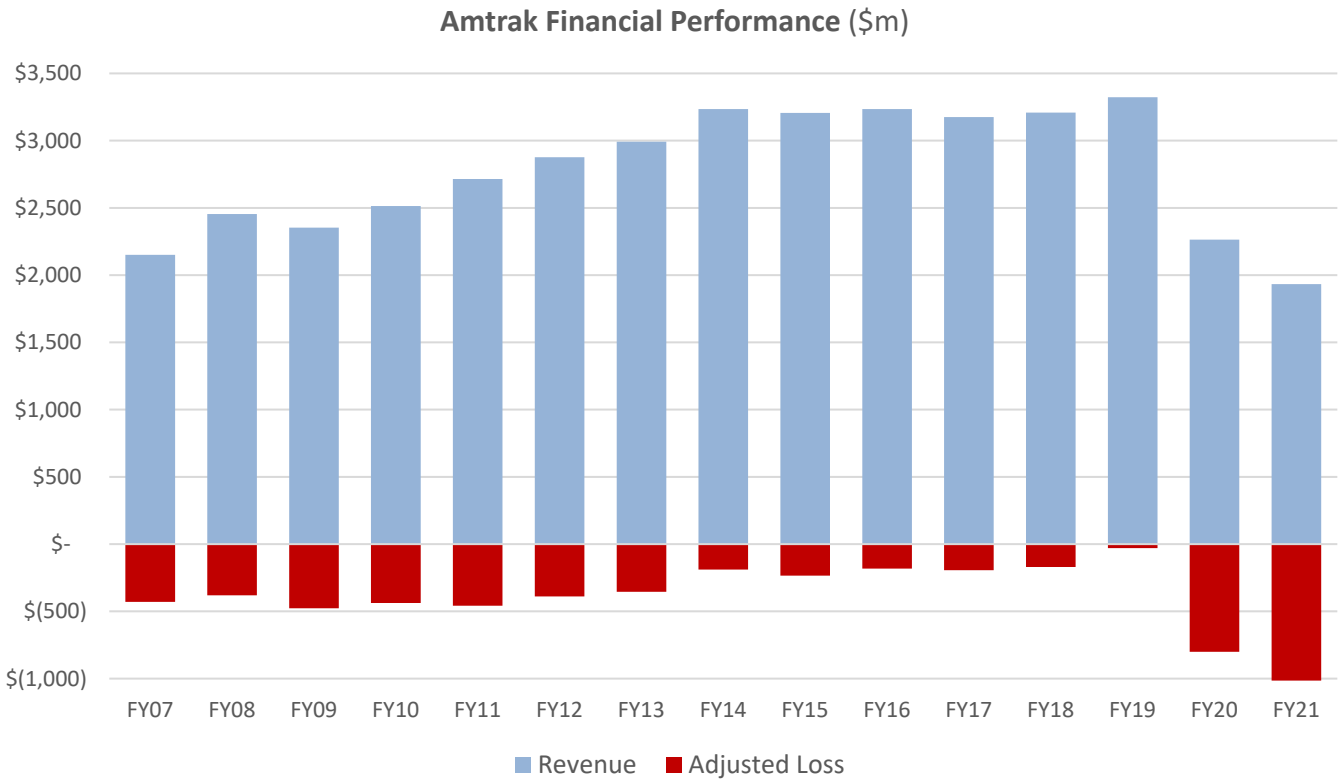
What is this program and what does this funding level support?

As the nation's primary operator of intercity passenger rail service and majority owner of one of the most important transportation assets in the world – the Northeast Corridor – the National Railroad Passenger Corporation (Amtrak) delivers integral services to connect our country and drive economic prosperity. Since Amtrak began operations in 1971, the Federal Government has provided needed funding each year to support Amtrak's operations and certain basic capital obligations, with periodic special appropriations dedicated to specific purposes, such as the Northeast Corridor Improvement Project in the 1980s, the Northeast High-Speed Rail Improvement Project in the 1990s, the American Recovery and Reinvestment Act in 2009, and most recently, COVID relief funding in 2020 and 2021 and the $22 billion in supplemental advance appropriations provided through the Infrastructure Investment and Jobs Act (IIJA).

Amtrak operates three primary types of intercity passenger rail services:

1. Higher speed, high frequency, **Northeast Corridor** (NEC) services;
2. **State-Supported**, short distance, corridor service on 28 routes that are located in densely populated regions and connections to smaller communities; and
3. **Long Distance** services on 15 routes greater than 750 miles that connect rural areas and population centers.

Amtrak has transformed its operations over the last 15 years, making significant strides to improve revenues, cost recovery, and ridership. Prior to COVID-19's dramatic effects on the transportation sector's travel demand and revenues, Amtrak was on pace to break-even operationally for the first time in its 50-year history in FY 2020. This performance came on the heels of record revenues and ridership of $3.3 billion and 32.5 million passengers, respectively, in FY 2019 and Amtrak's lowest ever operating loss of $29.7 million. [2]



The FY 2023 President's Budget builds upon the generational investment in rail provided by the IIJA supplemental over a five year period, which includes $22 billion in direct appropriations for Amtrak ($6 billion for the NEC account and $16 billion for the National Network account), $24 billion for projects on the NEC through the Federal-State Partnership for Intercity Passenger Rail (Partnership) program under which Amtrak-led projects will receive additional funding, as well as $20 billion more in Partnership, CRISI, and Railroad Crossing Elimination program funding that Amtrak can compete for or benefit from.

[2] Amtrak, Monthly Performance Report, FY 2019, April 10, 2020.

Delineating the Purpose of Amtrak's IIJA Funding and Annual Grants

IIJA Funding

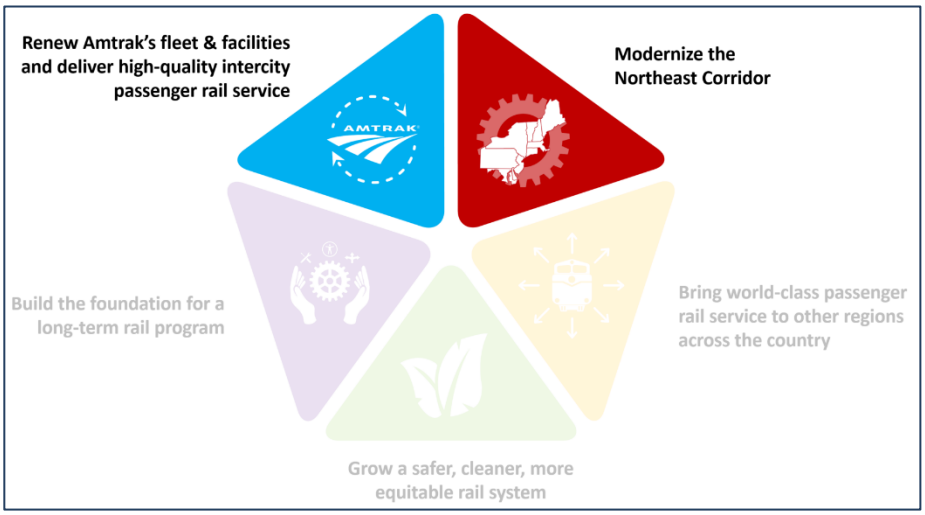
Congress and the Biden-Harris Administration set clear expectations for the use of the $22 billion in IIJA Amtrak supplemental funding, identifying six primary purposes:

1. **Acquiring new passenger rail rolling stock to replace Amtrak's aging and obsolete passenger equipment fleet.** This includes current procurements underway to replace Long Distance locomotives and Amfleet I railcars used in NEC Regional and some State-Supported services, as well as future procurements to retire the Amfleet II and Superliner fleet used in Long Distance and State-Supported services. The rehabilitation, upgrade, and expansion of facilities used to maintain and store this equipment is also eligible.
2. **Eliminating the backlog of deferred capital projects on Amtrak-owned assets located on the NEC that solely benefit Amtrak services.** Funding to address the NEC state of good repair backlog that jointly benefits Amtrak and the NEC's commuter rail services is available from the Partnership program. However, IIJA allows Amtrak to use a portion of the $6 billion provided for the NEC account as non-Federal match for joint benefit projects under the Partnership program.
3. **Eliminating the backlog of deferred capital projects on Amtrak-owned assets not located on the Northeast Corridor.** In addition to the NEC main line, Amtrak owns facilities and several hundred miles of main line track, sidings, and yards on the National Network that require rehabilitation and improvement.
4. **Eliminating the backlog of obsolete assets associated with Amtrak's national rail passenger transportation system**, such as systems for reservations, security, training centers, and technology.
5. **Bringing all Amtrak-served stations into compliance with the Americans with Disabilities Act (ADA).** Since FY 2012, Congress has specified that at least $50 million—and at least $75 million in FY 2021—be dedicated for this purpose. Similarly, the IIJA reauthorization of Amtrak requires DOT to withhold $50 million annually from amounts appropriated to Amtrak for ADA compliance.
6. **Carrying out NEC capital renewal backlog projects** that rebuild, upgrade, and modernize main line track and supporting systems over and above what can be accomplished in on-going annual maintenance programs. Some core infrastructure systems, such as the electric power system between New York City and Washington, D.C., originally installed in the 1930s, are in need of comprehensive reconstruction and upgrades to modern high-speed passenger service standards. Assets to be improved could include: track infrastructure such as main line track and ballast, yards and sidings, turnouts and switches; bridges and structures such as undergrade bridges, signal bridges, and culverts; electric traction power systems such as substations, catenary structures, and power wire; and communications and signals systems such as switch machines, track circuits, and grade crossing devices.

The IIJA supplemental funds provided directly to Amtrak or through the Partnership program will help to reverse decades of underinvestment in intercity passenger rail and address many of the major state of good repair backlog projects that have accumulated across the network. Many

of these projects represent multi-billion dollar initiatives that would have been difficult for Amtrak and/or their state partners to incrementally implement with previously provided Federal funding levels or with their own internal revenue sources.

Annual Grants



Even with the infusion of resources from the IIJA supplemental, sustained and increased investment in Amtrak and other FRA grant programs above previous funding levels is necessary to adequately maintain and grow the network, as well as support FRA's Key IIJA Investment Goals.[3] **A robust annual Amtrak grant is needed to continue offsetting operating losses on Long Distance and State-Supported routes, maintain existing capital assets and ensure no further infrastructure or equipment slip into a state of disrepair, and address the programmatic backlog of capital renewal projects that exists on the NEC.**

Funding requested for Amtrak's baseline FY 2023 annual grants will not contain any projects that fall in the first four IIJA categories outlined above. Such projects are considered discrete, one-time investments that should be addressed through the IIJA supplemental funding. The only areas of overlap that may occur between IIJA supplemental and annual Amtrak grant purposes are categories 5 (ADA compliance) and 6 (the programmatic backlog of capital renewal work). As described above, the programmatic backlog differs from the major bridges, tunnels, and other large-scale infrastructure projects envisioned under the Partnership program. Rather, these projects entail state of good repair and replacement of existing basic infrastructure—such as track and ballast, signals, catenary, and undergrade bridges—with the purpose of comprehensive renewal and modernization of these assets. These projects are often advanced as a package of related efforts to optimize project delivery and minimize service outages and other effects on riders.

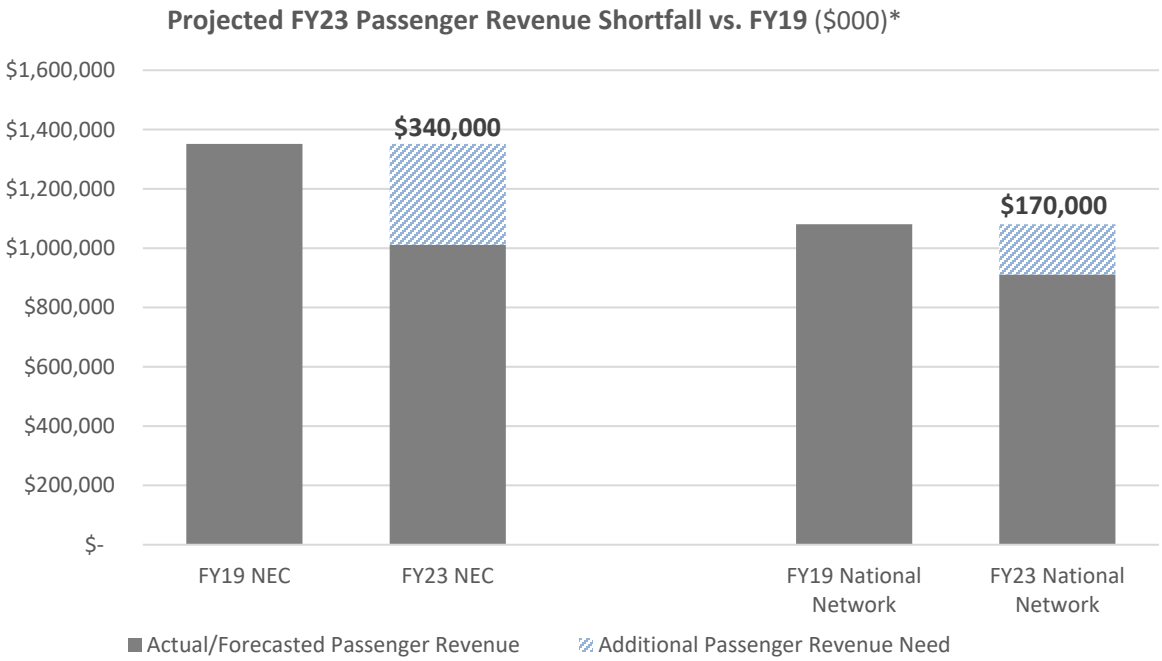
The FY 2023 President's Budget requests $3 billion for Amtrak, a $1 billion increase over Amtrak's recent base $2 billion funding level. This request will continue to support Amtrak's basic operating, capital, and legacy debt service needs. The $1.0 billion increase to Amtrak's prior base budget will support two primary functions:

1. **Increase Capital Investment** – Prior to IIJA and COVID-19, the combination of Amtrak's revenues, greater cost-sharing among Amtrak and NEC commuter rail agencies,

[3] While each FRA program supports and advances all five of FRA's Key IIJA Investment Goals, only the primary area(s) of alignment are highlighted in the callout box.

and increased funding from Congress had enabled Amtrak and its commuter partners to better maintain and invest in the NEC. Approximately $200 million of the increase proposed in the FY 2023 President's Budget will help to accelerate capital renewal projects on the NEC and address other capital projects to benefit State-Supported and Long Distance routes. Amtrak may use up to an additional $100 million for planning, capital, and operating costs associated with any Amtrak-operated routes selected under the new Corridor Identification and Development program established by the IIJA reauthorization. Finally, FRA proposes making $75 million available for capital investments to improve on-time performance on the National Network, taking into account findings and recommendations from any investigations carried out by the Surface Transportation Board.

2. **Replace Lost Revenue Due to COVID** – By April 2020, Amtrak suffered ridership declines of over 95 percent, severely affecting Amtrak's revenue and financial performance. While ridership and revenue have improved since the height of the pandemic, Amtrak's projected ridership and passenger revenues for FY 2023 still trail pre-pandemic levels. Approximately $510 million of the increase proposed in the FY 2023 President's Budget will be used to replace Amtrak revenue shortfalls vs. the company's pre-pandemic levels. An additional $145 million will assist states in fulfilling their cost-sharing responsibilities with Amtrak for State-Supported routes and NEC Baseline Capital Charge payments. These additional funds to both Amtrak and to benefit Amtrak's state partners align with the President's Executive Order 14002[4] to provide economic relief that prevents cuts to critical programs affected by the COVID-19 pandemic.



*Estimates based on projections from Amtrak's FY21-26 Five Year Service and Asset Line Plans; Amtrak will release updated projections in the new five year plan that accompanies their FY 2023 Grant and Legislative Request.

[4] E.O. 14002 of Jan 22, 2021.

Proposed Change to Amtrak Federal Grant Disbursements

The FY 2023 President's Budget proposes to change the disbursement approach for Amtrak's annual Federal grants. Prior to the passage of the FAST Act, Amtrak received quarterly disbursements for its Federal operating funds, and after an initial $200 million disbursement for working capital at the beginning of the fiscal year, all capital funds were provided on a reimbursable basis. In part due to the funding constraints that Amtrak had historically faced – including periods where the company's liquidity was just sufficient to maintain operations – the FAST Act established an advance payment process where all of Amtrak's annual Federal grant funds were disbursed on a set schedule (October 1, January 1, April 1).

The FAST Act changes have had unintended consequences. Amtrak now routinely maintains more than $3 billion in cash on hand. As previously described, these cash balances are in part a testament to Amtrak's improved financial practices and performance, where annual operating surpluses on the NEC were exceeding $500 million pre-COVID. However, Amtrak's cash balances are also inflated because of the FAST Act's advance payment clause. Amtrak executes a complex capital program with projects that can span several years, which results in Federal capital grant funds spending out over an approximately three-year horizon.

The FY 2023 President's Budget proposes to continue providing Federal grant funds for Amtrak's operating costs, legacy debt service payments, and normalized capital replacement programs[5] via the FAST Act's advance payment process. However, Federal funds intended for capital improvement projects to support service enhancements or growth, backlog capital replacement projects, strategic initiative projects, and statutory, regulatory, or other legal mandate projects would receive funding on a reimbursable basis. These types of discrete capital projects with fixed scopes, schedules, and budgets are more analogous to the investments made under the Department's and FRA's reimbursable grant programs. FRA estimates that approximately half of the $3.0 billion requested for Amtrak would continue to be provided via advance payment. IIJA amended the Amtrak grant payment process to allow payment methods other than advances when DOT and Amtrak agree that a different method is necessary to more successfully implement a project or report on a project's progress. FRA believes reimbursable payments for the types of discrete capital projects previously described meet this criterion.

[5] Normalized capital replacement programs include, but is not limited to, regularly recurring work programs implemented on a systematic basis on classes of physical railroad assets such as track, structures, electric traction and power systems, and communications and signal systems to maintain and sustain the condition and performance of these assets to support continued railroad operations.

FY 2022 Accomplishments

Anticipated FY 2022 accomplishments for FRA's funding of Amtrak include:

- Program standup activities and initial implementation of the $66 billion provided by the IIJA supplemental for rail, including $22 billion for Grants to Amtrak. This includes submission of a detailed spend plan to Congress by May 14, 2022 that identifies the projects to be funded with FY 2022 and FY 2023 supplemental funds.

- Continued monitoring and oversight of Amtrak's use of COVID-19 relief funds provided under the Coronavirus Response and Relief Supplemental Appropriations (CRRSA) Act and the American Rescue Plan (ARP) Act.

- Continued support of Amtrak's annual capital program to reduce their maintenance backlog and improve infrastructure, equipment, stations, facilities, information technology, and other support services required to provide intercity passenger rail operations.

- Continued manufacturing and testing of 28 new, next generation high-speed trainsets for the Acela service on the NEC. The new Acela trainsets will significantly increase capacity for Amtrak's premium service, by both expanding the Acela fleet by 8 trainsets and increasing the number of seats per trainset from 304 on the existing trains to 386 on the new equipment. The new Acela trainsets were financed by the Department's Build America Bureau in 2016 through the Railroad Rehabilitation and Improvement Financing (RRIF) Program.

- Continued development of 83 new trainsets to replace the 40-50+ year old Amfleet I railcars used on NEC Regional service and many State-Supported corridors across the country.

- Continued oversight of Amtrak's implementation of 5-year service line and asset line plans. Amtrak's asset lines include Transportation, Infrastructure, Equipment, Stations, and National Assets and Corporate Services. These plans complement the 5-year service line plans for NEC Intercity Operations, State-Supported, Long Distance, Infrastructure Access, and Ancillary Services. Asset lines provide resources and deliver transportation and related services to the service lines. The service line and asset line plans help to inform Amtrak's decision-making process and more clearly communicate with the Department, Congress, states, passengers and other partners on Amtrak's business priorities and financial performance.

The FY 2023 President's Budget request of $3.00 billion for Amtrak includes:

Northeast Corridor ($1.20 billion): The Northeast Corridor is the lifeblood to the region's economy, carrying more than 800,000 people each day on Amtrak and commuter services prior to the COVID-19 pandemic. Amtrak's NEC train operations account for 38 percent of its ridership (12.5 million) and more than 40 percent of its operating revenue ($1.3 billion).[6]

The FY 2023 President's Budget requests $1.20 billion for the Northeast Corridor account to fund the following needs:

- Normalized replacement of NEC infrastructure in order to maintain safe and reliable operations;
- Capital renewal and selected improvement projects beyond annual normalized replacement programs that improve corridor assets and operations;
- Annual equipment maintenance overhauls, repairs, and refurbishments;
- Principal and interest payments on Amtrak's legacy debt that is attributable to the NEC;
- Information technology and other "backbone" services to support NEC infrastructure and operations;
- Upgrades and repairs to Amtrak-served stations on the NEC, including projects to bring stations into compliance with Americans with Disabilities Act (ADA) requirements; and
- Planning and stakeholder coordination activities carried out by the Northeast Corridor Commission, which includes representatives from each of the eight NEC states, the District of Columbia, Amtrak, and the U.S. Department of Transportation.

The FY 2023 request includes approximately $340 million to cover Amtrak's projected revenue shortfall for the NEC vs. pre-COVID levels. This funding will enable Amtrak to preserve its annual NEC capital maintenance program. The FY 2023 request will also provide $55 million to assist NEC states and commuter agencies cover their cost-sharing responsibilities under the Northeast Corridor Commuter and Intercity Rail Cost Allocation Policy ($11 million of these funds will be provided under the National Network account, where costs for the Philadelphia-Harrisburg and New Haven-Springfield lines are allocated).

National Network ($1.80 billion): Statute defines the National Network to include capital, operating, and debt service for Amtrak's State-Supported routes, Long Distance routes, and other activities not allocated to the Northeast Corridor. The FY 2023 President's Budget requests $$1.80 billion for the National Network account to fund the following needs:

- Long Distance Routes ($1.02 billion): The 15 Long Distance routes currently operated by Amtrak serve more than 300 stations in 39 states. This funding will be used to provide the operating, capital, and debt service funding necessary to operate Long Distance trains. This funding includes approximately $95 million to cover Amtrak's projected revenue shortfall for the Long Distance service line vs. pre-COVID levels.

[6] Amtrak, Monthly Performance Report, FY 2019, April 10, 2020.

- State-Supported Routes ($454 million): The 28 State-Supported routes provide corridor service in 17 states. Section 209 of the Passenger Rail Investment and Improvement Act (PRIIA) required states to be financially responsible for supporting their corridor services, beginning in FY 2014. In FY 2019, states paid Amtrak nearly $300 million for capital and operating costs associated with State-Supported routes. FRA funding will provide capital assistance for the infrastructure, equipment, stations, and other assets utilized for State-Supported services, as well as the operating costs for "national" services to be defined in the PRIIA 209 cost methodology policy revision currently being developed by the State-Amtrak Intercity Passenger Rail Committee (SAIPRC), as required by IIJA. This funding includes approximately $75 million to cover Amtrak's projected revenue shortfall for the State-Supported service line vs. pre-COVID levels. Additionally, $90 million is reserved for payment relief for the states that sponsor these routes, due to the continued effects of COVID on state revenue sources and Amtrak ridership.

  Of this funding, $3 million will support the operations of the SAIPRC, as authorized by IIJA.

- Infrastructure Access ($139 million): While the majority of track over which Amtrak trains operate are owned by other railroads, Amtrak owns some infrastructure outside of the NEC mainline on the National Network. Amtrak-owned or controlled infrastructure on the National Network includes, but is not limited to:
  - 96 miles of the Michigan Line between Kalamazoo, MI - Porter, IN;
  - 103 miles of the Keystone Corridor between Philadelphia - Harrisburg, PA;
  - 61 miles of the Springfield Line between New Haven, CT - Springfield, MA;
  - 94 miles of the Hudson Line owned by CSX and leased to Amtrak between Poughkeepsie, NY - Hoffmans, NY (near Schenectady); and
  - the terminal areas in Chicago, New Orleans, and other locations.

  For these Amtrak-owned or controlled infrastructure and facilities, Amtrak is responsible for planning, developing, managing, and providing access to other rail operators (freight and passenger) and public or private entities that use those assets. Unlike on the NEC prior to COVID-19, National Network revenues are not sufficient to fully cover operating costs and Federal assistance is required.

- Corridor Development ($100 million): IIJA requires DOT to establish a program to (1) identify corridors with potential to support intercity passenger rail service, (2) partner with project sponsors, states, Amtrak, and other operators to develop a service development plan to guide the implementation of the intercity passenger rail service, and (3) establish and sequence a pipeline of capital projects to receive funding. Under IIJA, Amtrak may use up to 10 percent of National Network funds for planning, capital, and operating costs for Amtrak-operated corridors selected under this process. The FY 2023 President's Budget proposes to limit this category of funding to $100 million to focus Amtrak funding on its core capital and operating responsibilities.

- On-Time Performance Capital Projects ($75 million): On November 16, 2020, FRA published the final rule for measuring the performance and service quality of intercity passenger train operations, bringing to conclusion a twelve-year process to establish these important metrics.[7] The final rule requires Amtrak and its host railroads to certify Amtrak schedules, and sets an on-time performance minimum standard of 80 percent for any two consecutive calendar quarters. Other metrics defined in the final rule include ridership, train delays, station performance, and host running time. The final rule gives customers, Amtrak, its service providers, FRA, and others a common tool to help objectively gauge intercity passenger train travel. The metrics also support the Surface Transportation Board in their investigations of substandard intercity passenger rail train performance. FRA proposes to reserve up to $75 million for projects to address on-time performance issues that may be identified by the Surface Transportation Board in their investigations and determined by FRA to be an appropriate use of Amtrak grant funds.

- Interstate Rail Compact Grants ($3 million): IIJA authorized up to $3 million annually be reserved from the National Network for competitive grants to provide assistance for interstate rail compacts. These funds are authorized to be used for organizational administrative costs, railroad systems planning, preparation of Federal grant program applications, and other project promotion and coordination activities. Grants are limited to a maximum of $1 million.

- FRA Oversight ($15 million total from both the NEC and National Network): FRA has the responsibility to oversee the delivery of Amtrak's capital program, along with its operating initiatives. Improved project delivery of capital projects to maintain and improve infrastructure, equipment, stations, and systems are essential for Amtrak to continue meeting the needs of its customers. Congress directed FRA to oversee Amtrak performance and delivery by authorizing 0.5% of NEC and National Network appropriations to be dedicated to management oversight of Amtrak.

What benefits will be provided to the American public through this request and why is this program necessary?

Amtrak has weathered many challenges over its 50-year existence, including multiple economic downturns, major regulatory changes affecting Amtrak's common carrier competition and partners, natural disasters, and a lack of sufficient capital funding to provide the optimal rail services our country deserves. Through it all, Amtrak has persevered and is relied on by millions of Americans for their business and personal travel needs. As the nation looks to overcome existing and new challenges – ranging from meeting the mobility needs of our increasing population to responding to COVID-19 to the Biden-Harris Administration's commitment to advancing racial equity and addressing the climate crisis – Amtrak will continue to play an instrumental and expanding role in our transportation system.

[7] Federal Railroad Administration, Metrics and Minimum Standards for Intercity Passenger Rail Service, November 2020.

Among major travel modes, Amtrak's intercity passenger rail network uniquely links small, midsize, and large communities to each other within a single journey, connecting Americans across the country and serving a wide diversity of trips. At the proposed funding level, Amtrak's intercity passenger rail system will be affirmed on a solid financial footing that accounts for the continued recovery from the COVID pandemic and enables recapitalization of the existing network. Amtrak's annual grants provide the foundation for Amtrak, states, and other project sponsors to improve and expand the rail network through the $44 billion in competitive grant funds provided by the IIJA supplemental and the additional $1.35 billion proposed for FY 2023 in the President's Budget.

Vital Infrastructure – The NEC service disruptions caused by infrastructure failures, mechanical issues, rail traffic congestion, and other factors already cost the economy $500 million per year in lost productivity. A loss of all NEC services for just one day would cost the economy an estimated $100 million.[8] Prior to COVID, total delay incidents and delay time on the NEC had declined more than 10 percent from FY 2017-FY 2019, indicating some progress in improving reliability and service performance for Amtrak and its fellow NEC rail operators (delays incidents dropped significantly in FY 2020, in part due to suppressed trips on the corridor). But delays on the NEC persist, with the network experiencing an average 50 hours of train delay daily during FY 2019. The NEC proved its vitality to the region during the COVID-19 pandemic, as well: even with ridership corridor-wide down more than 95 percent during April 2020, at the initial height of the outbreak, NEC operators carried more than 52,000 daily trips, providing reliable and necessary service to essential workers throughout the region. [9]

Helps Meet Travel Demand – More than two times as many people travel through Amtrak's New York Penn Station every day than through JFK, LaGuardia and Newark airports combined.[10] In total, Amtrak provides a transportation choice to more than 500 communities across 46 of the 48 contiguous states. Prior to COVID, Amtrak and its state partners helped to increase ridership across the network by 35 percent over the previous 15 years, with the 28 State-Supported routes representing the fastest growing segment at 45 percent growth over this timeframe. The existing network can accommodate further growth within its current infrastructure and service capacity, and is poised to grow further with the help of the robust planning processes established by the Corridor Identification and Development program and transformational investments provided through IIJA.

Economic Development – In 2014, Amtrak and its passengers generated an economic benefit of approximately $10.8 billion, which supported 117,200 jobs and generated $1.7 billion in taxes for Federal, state, and local governments.[11] In addition, station development yields sizable economic benefits including attracting housing and retail development, restored parks and civic and private buildings, an increase in housing and property rental values, and tourism growth. Recent station redevelopment examples include Raleigh, North Carolina and Niagara Falls, New York.

[8] Northeast Corridor Commission, NEC Annual Report FY17, April 2018.
[9] Northeast Corridor Commission, NEC Annual Report FY20, March 2021.
[10] Amtrak, New Passenger Information Displays Improve Customer Experience at Penn Station New York, October 11, 2016.
[11] Amtrak, FY 2016 Budget and Business Plan.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

CONSOLIDATED RAIL INFRASTRUCTURE AND SAFETY IMPROVEMENTS APPROPRIATIONS LANGUAGE

CONSOLIDATED RAIL INFRASTRUCTURE AND SAFETY IMPROVEMENTS

For necessary expenses related to Consolidated Rail Infrastructure and Safety Improvements Grants, as authorized by section 22907 of title 49, United States Code, [$375,000,000]*$500,000,000*, to remain available until expended: [Provided, That for amounts available under this heading, eligible recipients under section 22907(b) of title 49, United States Code, shall include tribal governments and the District of Columbia, and for eligible projects under section 22907(c)(10) of such title, eligible recipients shall include non-profit organizations: Provided further, That for amounts available under this heading, eligible projects under section 22907(c)(8) of title 49, United States Code, shall include railroad systems planning, including the preparation of regional intercity passenger rail plans and State Rail Plans, and railroad project development activities, including railroad project planning, preliminary engineering, and the development and analysis of project alternatives: Provided further, That for amounts available under this heading, eligible projects under section 22907(c) of title 49, United States Code, shall include projects to reduce trespassing on railroad property and along railroad rights-of-way, including capital projects, suicide prevention activities, deployment of trespasser prevention technology, and enforcement activities:]Provided [further], That for *eligible* projects [described in the preceding proviso]*under section 22907(c)(11) of title 49, United States Code*, eligible recipients under section 22907(b) of title 49, United States Code, shall include any State, county, municipal, local, and regional law enforcement agency: Provided further, That for amounts available under this heading, the Secretary may award a grant without regard to the requirement in section 22905(c)(1) of title 49, United States Code: Provided further, That for projects benefitting underserved communities, as determined by the Secretary, section 22907(e)(1)(A) of title 49, United States Code, shall not apply and the Federal share of total project costs *may exceed 80 percent but* shall not exceed 90 percent, notwithstanding section 22907(h)(2) of such title: *Provided further, That the Secretary may retain up to $5,000,0000 of the amount provided under this heading to establish a National Railroad Institute to develop and conduct training and education programs for both public and private sector railroad and railroad-related industry employees (including the railroad manufacturing, supply, and consulting fields):* Provided further, That the Secretary may withhold up to 2 percent of the amount provided under this heading for the costs of award and project management oversight of grants carried out under [section 22907 of]title 49, United States Code.

Explanation of Changes: The FY 2023 President's Budget proposes certain changes under the CRISI program to increase the program's effectiveness and maximize new authorities provided under the Infrastructure Investment and Jobs Act (IIJA). Proposed changes include clarifying the recipient eligibility for the program's new trespass prevention project eligibility, increasing the maximum Federal cost share from 80 percent to 90 percent for projects that benefit underserved communities, providing the

Department discretion in applying railroad agreement grant conditions depending on the projects and stakeholders involved, and allowing the Department to retain $5 million to establish a National Railroad Institute.

EXHIBIT III-1
CONSOLIDATED RAIL INFRASTRUCTURE AND SAFETY IMPROVEMENTS
Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2021 ENACTED	FY 2022 CR	FY 2023 PRES. BUD.
Consolidated Rail Infrastructure and Safety Improvements	$ 375,000	$ 375,000	$ 500,000
Transfer to Financial Assistance Oversight and Technical Assistance	$ -	$ -	$ (10,000)
TOTAL, Base appropriations	$ 375,000	$ 375,000	$ 490,000
FTEs			
Direct Funded	0	0	0
Supplemental Funding			
IIJA Supplemental (Division J)			
Consolidated Rail Infrastructure and Safety Improvements	$ -	$ 1,000,000	$ 1,000,000
Transfer to Financial Assistance Oversight and Technical Assistance	$ -	$ (20,000)	$ (20,000)
TOTAL, Supplemental appropriations	$ -	$ 980,000	$ 980,000
FTEs			
Direct Funded	0	0	0
TOTAL, Account	$ 375,000	$ 1,355,000	$ 1,470,000

Program and Performance Statement

The Consolidated Rail Infrastructure and Safety Improvements (CRISI) program was authorized by Congress to improve the safety, efficiency, and reliability of passenger and freight rail systems. Eligible activities include a wide range of freight and passenger rail capital, safety technology deployment, planning, environmental analyses, research, workforce development, and training projects. Eligible recipients include states (including interstate compacts), local governments, Class II and Class III railroads and associations that represent such entities,

Amtrak and other intercity passenger rail operators, rail carriers and equipment manufacturers that partner with an eligible public-sector applicant, federally recognized Indian Tribes, the Transportation Research Board, University Transportation Centers, and non-profit rail labor organizations. As authorized by statute, the CRISI program requires a minimum non-Federal share of 20 percent, that preference be given to projects with at least a 50 percent non-Federal match, and that at least 25 percent of funds be provided to projects in rural areas. Unless otherwise stated in appropriations language, FRA intends to use the fully authorized amounts for these set-asides.

EXHIBIT III-1a
FEDERAL RAILROAD ADMINISTRATION
CONSOLIDATED RAIL INFRASTRUCTURE AND SAFETY IMPROVEMENTS
SUMMARY ANALYSIS OF CHANGE FROM FY 2022 TO FY 2023
Appropriations, Obligations, Limitations, and Exempt Obligations
($000)

	$000	**FTE**
FY 2022 CR	$375,000	0
ADJUSTMENTS TO BASE:		
Non-Pay Inflation	7,497	
SUBTOTAL, ADJUSTMENTS TO BASE	**7,497**	**0**
PROGRAM REDUCTIONS		
Travel	-150	
Other Contracts	-3,672	
SUBTOTAL, PROGRAM REDUCTIONS	**-3,822**	**0**
PROGRAM INCREASES		
Consolidated Rail Infrastructure and Safety Improvements	111,325	
SUBTOTAL, PROGRAM INCREASES	**111,325**	**0**
FY 2023 REQUEST	**490,000**	**0**
Supplemental Appropriations	**1,000,000**	**0**
Transfer to Financial Assistance Oversight and Technical Assistance	-20,000	
Net, Supplemental Appropriations	**980,000**	**0**
TOTAL	**1,470,000**	**0**

Detailed Justification for the Consolidated Rail Infrastructure and Safety Improvements

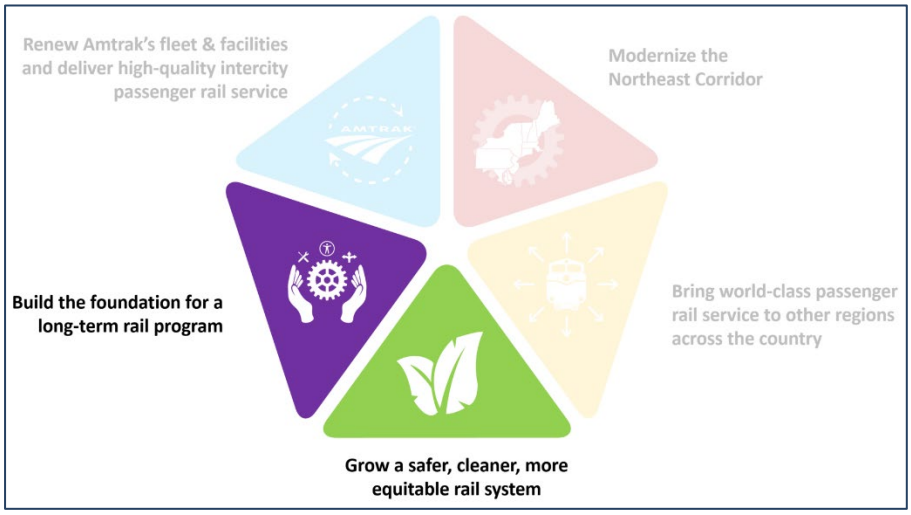
FY 2023 Consolidated Rail Infrastructure and Safety Improvements Budget Request ($000)

Program Activity	FY 2021 Enacted	FY 2022 Continuing Resolution	FY 2023 President's Budget
Consolidated Rail Infrastructure and Safety Improvements	$375,000	$375,000	$500,000
Total	**$375,000**	**$375,000**	**$500,000**
FTE	**0**	**0**	**0**

What is this program and what does this funding level support?

The Consolidated Rail Infrastructure and Safety Improvements (CRISI) program is FRA's most oversubscribed and flexible competitive grant program, supporting a wide range of freight and intercity passenger rail projects to improve safety, efficiency, and reliability. Since the program was first funded in FY 2017, FRA has received over $3.1 billion in funding requests for the nearly $1.2 billion that has been made available and awarded through FY 2020.

FRA Key IIJA Investment Goals



The Infrastructure Investment and Jobs Act (IIJA) reauthorized CRISI and provided a separate supplemental advance appropriation totaling $5 billion over five years. **The FY 2023 President's Budget requests $500 million for the CRISI program, in addition to the $1 billion provided in advance appropriations for FY 2023,** which will advance FRA's Key IIJA Investment Goals.[1]

[1] While each FRA program supports and advances all five of FRA's Key IIJA Investment Goals, only the primary area(s) of alignment are highlighted in the callout box.

The IIJA reauthorization contained several provisions consistent with CRISI reforms proposed in the FY 2022 President's Budget, including clarifying the eligibility of trespass prevention projects, adding federally recognized Indian Tribes as eligible applicants, and adding non-profit associations that represent Class II and Class III railroads as eligible applicants. Other notable CRISI changes contained in IIJA include allowing applicants for grade crossing and trespassing projects to count previous costs incurred for preliminary engineering towards the project's non-Federal match and adding three other new project eligibilities:

- Research, development, and testing to advance and facilitate innovative rail projects, including projects using electromagnetic guideways in an enclosure in a very low-pressure environment;
- The preparation of emergency plans for communities through which hazardous materials are transported by rail; and
- Rehabilitating, remanufacturing, procuring, or overhauling locomotives, provided that such activities result in a significant reduction of emissions.

In addition to CRISI, IIJA reauthorized and modified the Federal-State Partnership for Intercity Passenger Rail program (formerly Federal-State Partnership for State of Good Repair) and Restoration and Enhancement grants program, and created the new Railroad Crossing Elimination Program. One of the driving factors in the success of the CRISI program to date has been the program's wide-ranging eligibility, which has enabled the program to garner broad stakeholder support across the railroad industry. However, CRISI's comprehensive project eligibility also creates overlap among FRA's grant programs – CRISI can fund all program and applicant eligibilities under both the Partnership and Crossing Elimination programs.

For FY 2023, FRA proposes to prioritize CRISI funding to project types not addressed by the Partnership and Railroad Crossing Elimination programs. Therefore, Partnership will cover larger-scale intercity passenger rail investments intended to lead to service changes, such as new frequencies, new services, service extensions, and significant trip time and/or operating speed improvements. The Railroad Crossing Elimination program will be first in line to fund highway-rail grade crossing projects among FRA grant programs. However, FRA intends to maintain the full flexibility to fund all authorized projects under CRISI. Under this approach, CRISI will still have a wide variety of project types to fund, including:

- Short line railroad infrastructure and equipment, including helping short line railroads retire their aging locomotive fleet and replace them with greener technologies;
- Rail line relocations or improvements, particularly in underserved or disadvantaged communities;
- Congestion relief projects to address freight and passenger rail chokepoints and improve network fluidity;
- Safety projects, including the deployment of positive train control and other safety technologies; and
- The new IIJA project eligibilities described above.

New Efforts to Build Industry and Workforce Capacity

In order to adequately maintain our current rail network, deliver improvements to support the transportation demand of a growing population, and build a diverse workforce representative of all Americans, the railroad industry must do more to strengthen project development/delivery capacity, training, and employee recruitment and retention. These principles are also key to implementing the IIJA. The FY 2023 President's Budget proposes two important initiatives under CRISI to support these efforts:

- **Dedicate $5 million to establish a National Railroad Institute** to develop and conduct training and education programs for both public- and private-sector railroad and railroad-related industry employees (including the railroad manufacturing, supply, and consulting fields). The nation's highway and transit systems have benefited from decades of Departmental leadership in workforce training and technical assistance delivered through the Federal Highway Administration's National Highway Institute (NHI) and Federal Transit Administration's National Transit Institute (NTI). A National Railroad Institute will provide railroad industry employees with similar opportunities to their counterparts in highways and transit to develop and maintain the skillsets and tools to succeed in the industry's rapidly evolving technological landscape.

- **Dedicate $5 million to establish a Railroad Workforce Development Program within CRISI** to provide grants to eligible CRISI recipients, including non-profit groups representing railroad employees, to develop and execute their own internal or third-party workforce training and apprenticeship programs. Grants for workforce development and training programs have been eligible under CRISI since the program was first authorized by the FAST Act. However, FRA has received very few applications for these types of activities, and has only funded two such projects to date. By dedicating funding and a formal program for these activities, FRA is confident it can spur greater interest in workforce development and training.

Tackling the Climate Crisis

Rail is among the most energy-efficient modes of transportation, particularly when dealing with the movement of freight. Rail carries approximately one-third of all freight on a ton-miles basis[2], yet consumes less than 2 percent of transportation sector energy.[3] CRISI projects that can help divert even a small portion of freight that moves by truck to rail could result in considerable reductions in fuel consumption and greenhouse gas emissions. In March 2021, the Association of American Railroads issued a climate change report that estimated greenhouse gas emissions could fall by more than 17 million tons annually if 10 percent of freight shipped by the

[2] U.S. Department of Transportation, Bureau of Transportation Statistics, U.S. Ton-Miles of Freight, February 2022.
[3] U.S. Department of Transportation, Bureau of Transportation Statistics, Energy Consumption by Mode of Transportation, February 2022.

largest trucks were shifted to rail – equivalent to removing 3.35 million cars from highways or planting 260 million trees.[4]

CRISI was designed in part to assist short line railroads in addressing their backlog of infrastructure needs.[5] Short line railroads play a vital role in the U.S. transportation system, often providing the "first- and last-mile" connections to the Class I network for freight shippers and customers. Ensuring these railroads can accommodate growth in freight rail shipments is essential to both maximizing the environmental benefits of moving freight by rail and maintaining a strong supply chain.

In addition to supporting short line infrastructure, CRISI can accelerate short line railroads' plans to retire their aging locomotive fleet and replace them with greener technologies that will reduce harmful emissions, including more efficient diesel locomotives that meet Tier 4 emission standards and emerging alternative fuels and battery technologies. FRA will encourage short line railroads to apply for CRISI funding for these purposes.

Equity and Justice40 Initiatives

In addition to the workforce development, capacity building, and climate initiatives proposed above, the FY 2023 President's Budget for CRISI contains additional measures to further the Biden-Harris Administration's efforts to create a more equitable transportation system. While many towns and cities were built around rail investments dating back a century or more, these rail lines often bisect communities and neighborhoods, and present barriers to important services and opportunities. CRISI is well-positioned to support efforts to reconnect downtown neighborhoods. To achieve these goals, the FY 2023 President's Budget proposes to:

- Consistent with the Justice40 initiative, dedicate at least 40 percent of CRISI funds—$200 million—for rail line relocations and other projects to mitigate the detrimental safety and quality of life effects rail transportation can have on underserved or disadvantaged communities and;
- Eliminate the statutory preference for a 50 percent non-Federal match for CRISI projects in or benefiting underserved communities and reducing the required match for such projects from 20 percent to 10 percent. These changes to CRISI will enable the communities most in need to better compete for resources.

[4] Association of American Railroads, Freight Railroads & Climate Change, March 2021.
[5] In 2014, FRA surveyed the industry and estimated that a nearly $7 billion funding gap existed to address the current and near-term capital needs of Class II and Class III railroads. FRA, Summary of Class II and Class III Railroad Capital Needs and Funding Sources, October 2014.

What benefits will be provided to the American public through this request and why is this program necessary?

Our nation's rail network is a critical component of the U.S. transportation system and economy. Prior to the COVID-19 public health emergency, rail carried over 32.5 million passengers on Amtrak services[6] and approximately 1.6 billion tons of freight valued at over $600 billion each year.[7] The Consolidated Rail Infrastructure and Safety Improvements program will enhance rail safety, help to undo inequities caused by transportation and land use policies and create new opportunities for underserved communities, provide energy efficient transportation options to confront the effects of climate change, invest in projects that spur economic growth, and ensure our would-class freight network can meet the mobility demands of a growing population.

U.S. Rail System

Increased Safety – According to a report by the OneRail Coalition, fatal accidents involving freight rail take place at less than one-third the rate of truck accidents. Accidents involving injuries are one-fifth as frequent, and property damage accidents are 62 times less frequent.[8] However, opportunities exist to further improve the safety of the rail network.

[6] Amtrak, Monthly Performance Report, FY 2019, April 10, 2020.
[7] U.S. Department of Transportation, Bureau of Transportation Statistics, Freight Facts and Figures.
[8] OneRail, Rail Safety in the United States, 2016.

Freight and Passenger Growth – Each American requires the movement of approximately 40 tons of freight per year across the freight network and approximately 85,000 passengers per day ride intercity trains. In addition to its intercity riders, the Northeast Corridor supports more than 700,000 commuter rail passengers per day. By 2045, the U.S. freight system is projected to experience a nearly 40 percent increase in the total amount of tonnage it moves, with the rail share expected to increase by 24 percent.[9] Over this same timeframe, U.S. population is anticipated to grow by nearly 20 percent. Passenger and freight rail transportation must play a critical role in accommodating this projected growth and provide an alternative to the nation's increasingly congested airports and highways.

Energy Efficient – The United States uses more than 13 million barrels of petroleum products every day for transportation, representing two-thirds of the nation's petroleum usage.[10] On average, rail transportation is four times more fuel efficient than trucks. On average, U.S. railroads move a ton of freight an average of 480 miles per gallon of fuel.[11]

Private Sector Partnership – The majority of both freight and intercity passenger rail services operate over privately-owned infrastructure, which enables private investment that generates significant public benefits. The Association of American Railroads estimates that U.S. freight railroads have invested approximately $740 billion over the last 40 years to maintain and improve their assets.[12] Given the variety of private and public sector stakeholders and benefits associated with rail projects, the CRISI program is well-positioned to attract funding from multiple project partners from both the public and private sectors.

[9] U.S. DOT, Beyond Traffic 2045, January 2017.
[10] U.S. Energy Information Administration, Monthly Energy Review, January 2022.
[11] Association of American Railroads, Sustainability Fact Sheet, April 2021.
[12] Association of American Railroads, Railroad 101, February 2022.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FEDERAL-STATE PARTNERSHIP FOR INTERCITY PASSENGER RAIL GRANTS
APPROPRIATIONS LANGUAGE

FEDERAL-STATE PARTNERSHIP FOR INTERCITY PASSENGER RAIL GRANTS

For necessary expenses related to Federal-State Partnership for Intercity Passenger Rail Grants, as authorized by section 24911 of title 49, United States Code, $555,000,000, to remain available until expended: Provided, That for projects benefitting underserved communities, as determined by the Secretary, the Federal share of total project costs may exceed 80 percent but shall not exceed 90 percent, notwithstanding section 24911(f)(2) of title 49, United States Code: Provided further, That the Secretary may withhold up to 2 percent of the amount provided under this heading for the costs of award and project management oversight of grants carried out under title 49, United States Code.

Explanation of Changes: The FY 2023 President's Budget is requesting funding for the Federal-State Partnership for Intercity Passenger Rail program, which was significantly expanded under the Infrastructure Investment and Jobs Act (IIJA) from the previous FAST Act authorized program. Proposed changes to the IIJA authorization include increasing the maximum Federal cost share from 80 percent to 90 percent for projects that benefit underserved communities.

EXHIBIT III-1
FEDERAL-STATE PARTNERSHIP FOR INTERCITY PASSENGER RAIL GRANTS
Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2021 ENACTED	FY 2022 CR	FY 2023 PRES. BUD.
Federal-State Partnership for Intercity Passenger Rail Grants	$ 200,000	$ 200,000	$ 555,000
Transfer to Financial Assistance Oversight and Technical Assistance	$ -	$ -	$ (11,100)
TOTAL, Base appropriations	$ 200,000	$ 200,000	$ 543,900
FTEs			
Direct Funded	0	0	0
Supplemental Funding			
IIJA Supplemental (Division J)			
Federal-State Partnership for Intercity Passenger Rail Grants	$ -	$ 7,200,000	$ 7,200,000
Transfer to Financial Assistance Oversight and Technical Assistance	$ -	$ (144,000)	$ (144,000)
TOTAL, Supplemental appropriations	$ -	$ 7,056,000	$ 7,056,000
FTEs			
Direct Funded	0	0	0
TOTAL, Account	$ 200,000	$ 7,256,000	$ 7,599,900

Program and Performance Statement

The Federal-State Partnership for Intercity Passenger Rail program was authorized by Congress to reduce the state of good repair backlog, improve performance, or expand or establish new intercity passenger rail service. Eligible activities include capital projects to meet the program purpose, as well as planning, environmental studies, and final design of such projects. Eligible recipients include states (including interstate compacts), local governments, Amtrak, and federally recognized Indian Tribes. The program requires that both projects on the Northeast

Corridor (NEC) and projects located off the corridor receive not less than 45 percent of annual funds each year. Of the annual appropriation amount provided for projects not located on the NEC, at least 20 percent of such funds must be for projects that benefit Long Distance routes. The program requires a minimum non-Federal share of 20 percent and allows the Secretary to withhold up to 5 percent of funds to carry out the new Corridor Identification and Development Program, as well as develop related service development plans, systems planning guidance, and analytical tools and models. Unless otherwise stated in appropriations language, FRA intends to use the fully authorized amounts for these set-asides.

EXHIBIT III-1a
FEDERAL RAILROAD ADMINISTRATION
FEDERAL-STATE PARTNERSHIP FOR INTERCITY PASSENGER RAIL GRANTS
SUMMARY ANALYSIS OF CHANGE FROM FY 2022 TO FY 2023
Appropriations, Obligations, Limitations, and Exempt Obligations
($000)

	$000	**FTE**
FY 2022 CR	$200,000	0
ADJUSTMENTS TO BASE:		
Non-Pay Inflation	3,999	
SUBTOTAL, ADJUSTMENTS TO BASE	**3,999**	**0**
PROGRAM REDUCTIONS		
Travel	-40	
Other Contracts	-1,999	
SUBTOTAL, PROGRAM REDUCTIONS	**-2,039**	**0**
PROGRAM INCREASES		
Federal-State Partnership for Intercity Passenger Rail Grants	341,940	
SUBTOTAL, PROGRAM INCREASES	**341,940**	**0**
FY 2023 REQUEST	**543,900**	**0**
Supplemental Appropriations	**7,200,000**	**0**
Transfer to Financial Assistance Oversight and Technical Assistance	-144,000	
Net, Supplemental Appropriations	**7,056,000**	**0**
TOTAL	**7,599,900**	**0**

Detailed Justification for the Federal-State Partnership for Intercity Passenger Rail Grants

FY 2023 Federal-State Partnership for Intercity Passenger Rail Grants
Budget Request
($000)

Program Activity	FY 2021 Enacted	FY 2022 Continuing Resolution	FY 2023 President's Budget
Federal-State Partnership for Intercity Passenger Rail Grants	$200,000	$200,000	$555,000
Total	**$200,000**	**$200,000**	**$555,000**
FTE	**0**	**0**	**0**

What is this program and what does this funding level support?

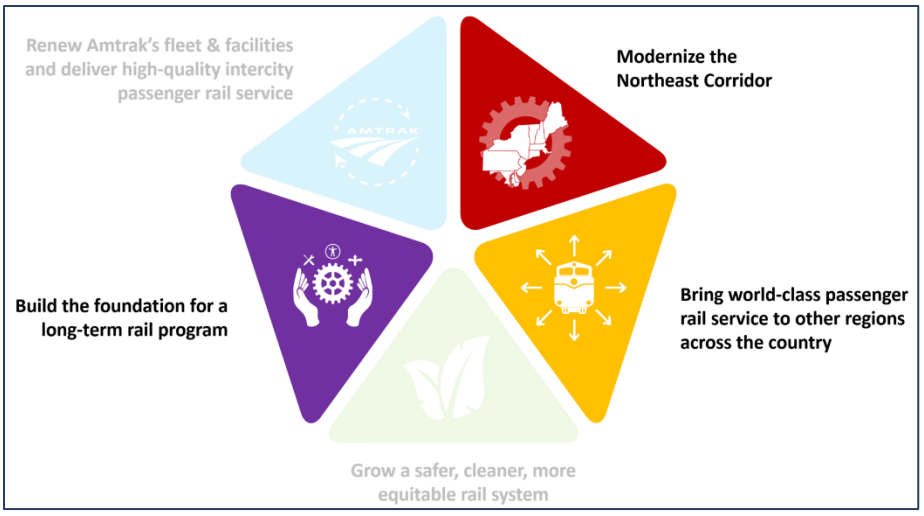
The Federal-State Partnership for State of Good Repair program has funded 33 projects totaling $866 million through FY 2020. The Infrastructure Investment and Jobs Act (IIJA) expanded and reauthorized the program, and provided a separate supplemental advance appropriation totaling $36 billion over five years. The IIJA reauthorization contained several significant changes to the program, most notably:

- Expanding the purpose of the program from supporting only projects that are owned or controlled by a public entity or Amtrak to any otherwise eligible project, regardless of asset ownership. This change will enable the program to fund intercity passenger rail projects located on host freight railroads, which represents the majority of today's rail network, and other privately-owned rights-of-way; and
- Expanding the program's eligibility from strictly capital projects to also include planning, environmental studies, and engineering activities, which will aid in the efficient development and delivery of projects.

Given the expanded focus of the program under IIJA, the program was renamed Federal-State Partnership for Intercity Passenger Rail (Partnership).

The FY 2023 President's Budget requests $555 million for the Partnership program, in addition to the $7.2 billion provided in advance appropriations for FY 2023, which will advance FRA's Key IIJA Investment Goals.[1] FRA intends to use the Partnership program as the primary investment program for intercity passenger rail outside of Amtrak funding. Partnership will help Northeast Corridor (NEC) stakeholders systematically address the NEC's state of good repair backlog and implement service improvements, and help improve existing intercity passenger rail corridors or develop new corridor services across the country.

FRA Key IIJA Investment Goals



In order to ensure an equitable geographic distribution of Partnership funding, IIJA requires that both projects on the NEC and projects located off the corridor funded from annual appropriations receive no less than 45 percent of funds each year. IIJA also requires robust planning processes to inform the selection of projects for Partnership funding.

Pending the outcomes of these planning processes, FRA envisions applying Partnership funding to the full range of project eligibilities, including the following purposes:

- **Northeast Corridor**
  - Major state of good repair projects to completely overhaul or replace the major, 100+ years-old bridges and tunnels on the corridor;
  - Major improvement projects to increase capacity and service performance on the corridor, including station redevelopment and expansion;
  - The programmatic backlog of capital renewal work necessary to bring the NEC into a state of good repair;[2] and
  - Planning, engineering, and environmental analyses necessary to move future projects toward construction.

- **Non-Northeast Corridor**
  - Initiating intercity passenger rail service on new or restored corridors;

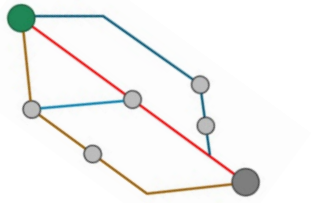
[1] While each FRA program supports and advances all five of FRA's Key IIJA Investment Goals, only the primary area(s) of alignment are highlighted in the callout box.
[2] The programmatic backlog of capital renewal projects includes: track infrastructure such as main line track and ballast, yards and sidings, turnouts and switches; bridges and structures such as undergrade bridges, signal bridges, and culverts; electric traction power systems such as substations, catenary structures, and power wire; and communications and signals systems such as switch machines, track circuits, and grade crossing devices.

- Improvements in frequencies and trip times on existing State-Supported and Long Distance services;
- New and improved stations; and
- Planning, engineering, and environmental analyses necessary to move future projects toward construction.

To implement the large-scale investments contemplated under the Partnership program—both the IIJA supplemental and base program—FRA will make use of the revised Letter of Intent and new Phased Funding Agreement authorities provided by IIJA. These tools will allow FRA to make transparent, contingent commitments to projects that require multiple years of Federal funding. These tools will enable the Federal dollar to go further and recognize the multi-year process for building rail projects, as well as provide assurances to project sponsors that the Federal Government is a reliable partner that will see a selected project through to completion.

Planning Processes

IIJA requires separate planning processes for projects located on the NEC and off the corridor to (1) inform project selection and (2) develop and maintain a pipeline of projects ready for future funding. For NEC projects, IIJA requires the Department to develop a NEC Project Inventory to identify and sequence projects to receive funding. The Department is on track to meet the November 15, 2022 statutory deadline to develop the NEC Project Inventory. The NEC Project Inventory must take into consideration the NEC Commission's comprehensive Connect NEC 2035[3] plan—which was first released in July 2021 and is currently being updated to reflect the passage of IIJA. FRA must consult with the NEC Commission members and the owners of NEC infrastructure and facilities (including Amtrak, Massachusetts Bay Area Transportation Authority (MBTA), Connecticut Department of Transportation, and Metro-North Railroad).



Illustrative network configuration planning

For projects located off the NEC, IIJA requires the Department to establish a Corridor Identification and Development program to (1) identify corridors with potential to support intercity passenger rail service, (2) partner with project sponsors, states, Amtrak, and other operators to develop a service development plan to guide the implementation of the intercity passenger rail service, and (3) establish and sequence a pipeline of capital projects to receive funding. FRA must establish the Corridor Identification and Development program by May 14, 2022 and issue the first project pipeline one year thereafter. FRA is conducting significant stakeholder outreach to help determine how the program should be implemented, including issuing a Request for Information and holding listening sessions with affected parties.[4] IIJA

[3] NEC Commission, Connect NEC 2035, July 2021.
[4] FRA, Request for Information for the Corridor Identification and Development Program, 87 Fed. Reg. 6938-6940 (February 7, 2022).

authorizes FRA to withhold up to 5 percent of Partnership funds to be used for rail planning and development activities, including projects to fund service development plans for corridors selected under the Corridor Identification and Development program.

IIJA also allows FRA to use the 5 percent takedown for rail planning and development activities to create guidance, tools, and models to help stakeholders more efficiently develop and deliver projects. Potential guidance and tool focus areas include service planning, travel demand forecasting, operations analysis, alternatives analysis, station and access planning, engineering, and cost estimation. FRA is also evaluating how to provide more direct resources and technical support to assist states in building their internal rail planning capacity.

What benefits will be provided to the American public through this request and why is this program necessary?

The United States faces a number of interrelated transportation challenges that pose a significant threat to our nation today and in the future. The country and the world must act now to avoid the looming catastrophic impacts of climate change. Our transportation policies and investment decisions have also done a disservice to many Americans, from segregating and displacing communities to not ensuring that all individuals can access our rail stations and trains over 30 years after the passage of the Americans with Disabilities Act. The passage of IIJA represents an essential step in helping to right some of these inequities. Now railroad stakeholders must step up and do our part to deliver on the promise of IIJA. Policymakers must also recognize that a one-time infusion of $66 billion is not sufficient to solve climate change or provide underserved communities with the first-rate transportation choices all Americans deserve. Sustained investment in railroad infrastructure and services is necessary to continue advancing these priorities and to provide for the mobility and economic security needs of a population that is projected to grow by nearly 70 million over the next 40 years.

Demand for Rail – Prior to the COVID-19 pandemic, Amtrak set an all-time ridership record, carrying over 32.5 million passengers in FY 2019. This performance is even more impressive when taking into consideration that many major markets across the country – and particularly in the Southeast, Southwest, and Texas – are either grossly underserved or not served by rail at all. Of the top ten fastest growing metropolitan areas over the last decade, only three major markets are served by at least three intercity passenger rail trains per day.

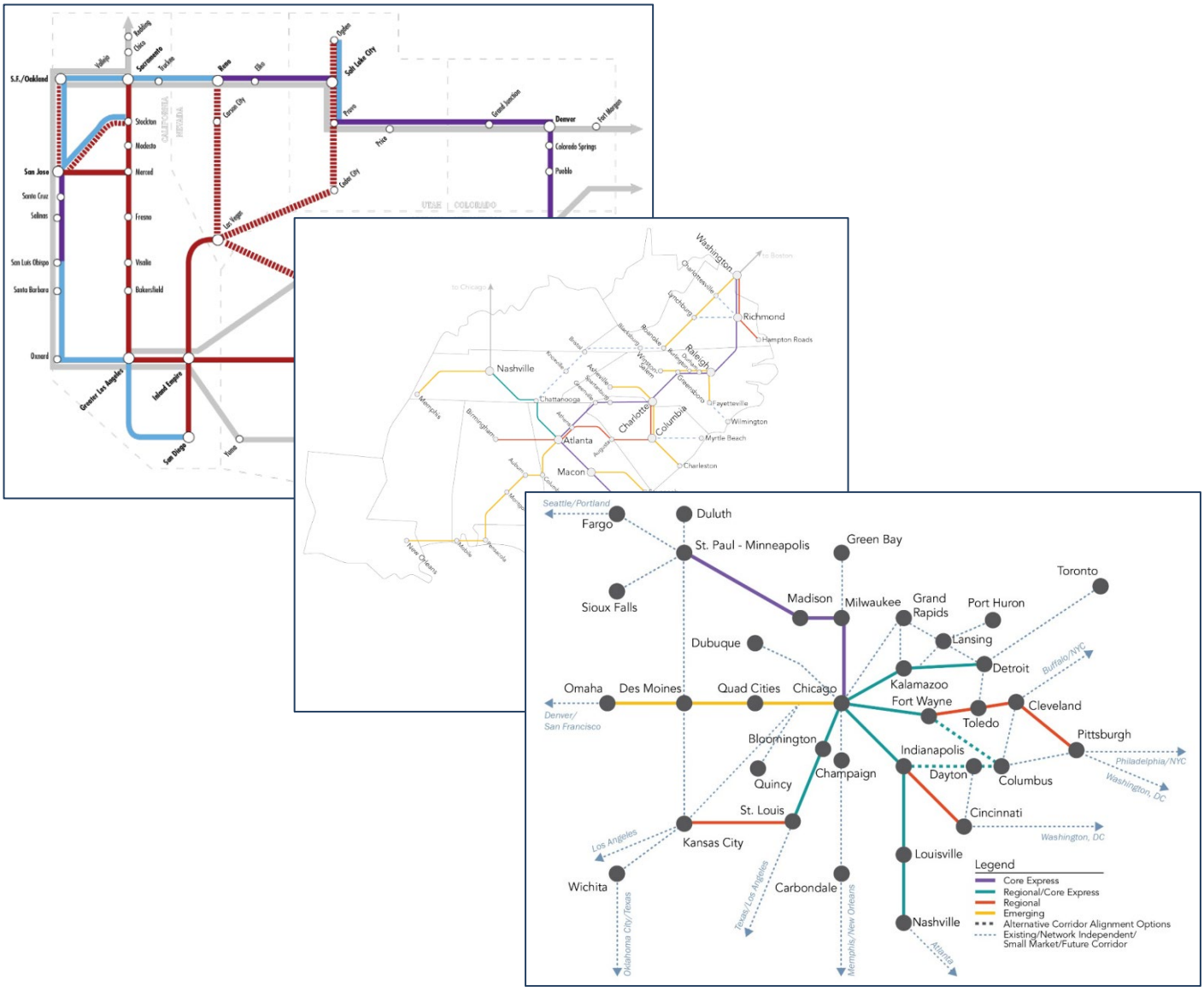
Top 10 Metropolitan Areas by Numeric Growth (2010 – 2019)

Rank	Metropolitan Area	July 2019 Population	Population Growth 2010-2019	Major Metro Station	Number of Daily Round Trip Trains
1	Dallas-Fort Worth-Arlington, TX	7,573,136	1,206,599	Dallas Fort Worth	1 2
2	Houston-The Woodlands-Sugar Land, TX	7,066,141	1,145,654	Houston	<1
3	Phoenix-Mesa-Chandler, AZ	4,948,203	755,074	N/A[1]	0
4	Atlanta-Sandy Springs-Alpharetta, GA	6,020,364	733,646	Atlanta	1
5	Washington, Arlington, Alexandria, DC-VA-MD-WV	6,280,487	630,799	Washington	45
6	Miami-Fort Lauderdale-Pompano Beach, FL	6,166,488	600,214	Miami (Amtrak) Miami (Brightline)	2 17
7	Seattle-Tacoma-Bellevue, WA	3,979,845	540,037	Seattle	7
8	Austin-Round Rock, Georgetown, TX	2,227,083	510,760	Austin	1
9	Orlando-Kissimmee-Sanford, FL	2,608,147	473,748	Orlando	2
10	Riverside-San Bernardino-Ontario, CA	4,650,631	425,683	Riverside	1

1/ Maricopa, located 35 miles south of Phoenix, is the closest station serving Phoenix with trains arriving/departing only three days per week.

Over the last 15 years, states, public rail authorities, and some private sector entities have led extensive planning efforts to prepare rail projects for investment. FRA has also led several studies over this timeframe, including NEC FUTURE and three regional rail plans. NEC FUTURE established a long-term vision and investment program for the NEC; the NEC Commission's Connect NEC 2035 plan represents initial phase towards advancing the NEC FUTURE vision. FRA's regional planning studies—carried out in partnership with transportation stakeholders in the Southwest, Southeast, and Midwest—are intended to establish a framework to guide each region's respective rail network planning objectives.

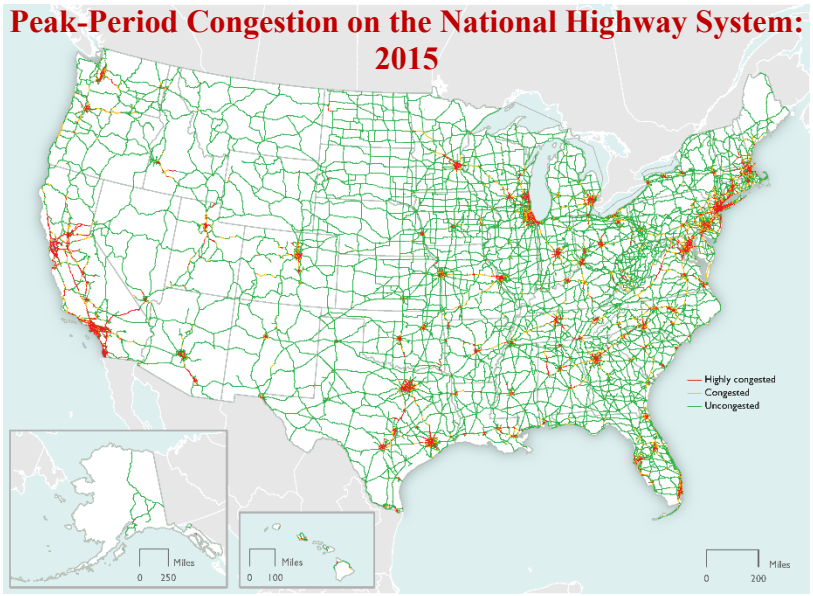
FRA Regional Rail Planning Studies[5]

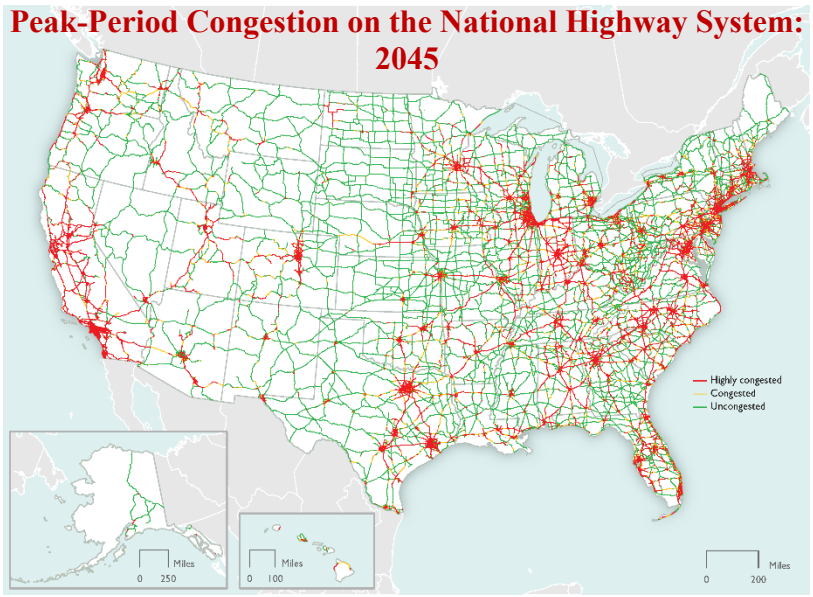


Mounting Congestion – As the U.S. population grows, so too does the use of its transportation systems. Prior to COVID's drastic effect on transportation, the Texas A&M Transportation Institute found that the cost of traffic congestion increased from $15 billion per year in 1982 to $190 billion in 2019, when factoring in lost time, productivity, and fuel consumption.[6] The U.S. Department of Transportation's Freight Analysis Framework projects significant increases in highway congestion over the next 25 years, as shown in the maps below[7]. Investing in intercity passenger rail will offer a release valve for highway and aviation congestion, especially in

[5] FRA, Regional Rail Planning, October 2021.
[6] Texas A&M Transportation Institute, 2021 Urban Mobility Report, June 2021.
[7] U.S. Department of Transportation, Bureau of Transportation Statistics, Freight Facts and Figures.

markets where further highway and airport expansion may be geographically infeasible due to land use, environmental, and community impacts – particularly the disadvantaged communities that were already failed by previous investments that displaced and disrupted residents.





Greenhouse Gas Emissions – Each year, the U.S. Environmental Protection Agency compiles the *Inventory of U.S. Greenhouse Gas Emissions and Sinks*[8], which provides a comprehensive accounting of total greenhouse gas emissions for all man-made sources in the United States. While greenhouse gas emissions in the U.S. have fallen from their peak in the mid-2000s, they are still 1.8 percent higher than they were in thirty years ago. In 2019, transportation accounted for nearly 29 percent of all U.S. greenhouse gas emissions. The transportation sector must do its part in reducing these harmful emissions and meeting our climate goals. This includes not only

[8] U.S. Environmental Protection Agency, U.S. Greenhouse Gas Emissions and Sinks: 1990-2019, April 2021.

adopting more energy efficient vehicles and fuel alternatives, but expanding investment and use of passenger rail options for intercity travel. Trips on Amtrak are more energy efficient than similar trips by car or plane, with data from 2018 showing Amtrak used 45 percent less energy than car travel and 33 percent less than air travel per passenger mile.[9] Amtrak has reduced its greenhouse gas emissions by 20 percent since 2010 and continues to seek efficiencies and emissions reductions across its business.[10]

[9] U.S. Department of Energy, Oak Ridge National Laboratory, Transportation Energy Data Book, Edition 39, Table 2.13, February 2021.
[10] Amtrak, Travel Green, accessed April 2021.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

RESTORATION AND ENHANCEMENT GRANTS
APPROPRIATIONS LANGUAGE

RESTORATION AND ENHANCEMENT GRANTS

For necessary expenses related to Restoration and Enhancement Grants, as authorized by section 22908 of title 49, United States Code, $50,000,000, to remain available until expended: Provided, That amounts made available under this heading in previous fiscal years are subject to section 22908 of title 49, United States Code, as in effect on the effective date of the Infrastructure Investment and Jobs Act (Public Law 117-58): Provided further, That the limitation in subsection 22908(e)(2) of title 49, United States Code shall not apply to amounts made available for grants under 22908 of title 49, United States Code in this Act or any prior Act: Provided further, That the Secretary may withhold up to 1 percent of the funds provided under this heading to fund the costs of award and project management and oversight of grants carried out under title 49, United States Code.

Explanation of Changes: The FY 2023 President's Budget proposes changes to the Restoration and Enhancement Grants program to ensure FRA can effectively administer the program, including applying the changes made to the program under the Infrastructure Investment and Jobs Act to funding appropriated between FY 2017 – FY 2021 and striking the limitation that no more than six grants may be active simultaneously.

EXHIBIT III-1
RESTORATION AND ENHANCEMENT GRANTS
Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2021 ENACTED	FY 2022 CR	FY 2023 PRES. BUD.
Restoration and Enhancement Grants	$ 4,720	$ 4,720	$ 50,000
Transfer to Financial Assistance Oversight and Technical Assistance	$ -	$ -	$ (500)
TOTAL, Base appropriations	$ 4,720	$ 4,720	$ 49,500
FTEs			
Direct Funded	0	0	0

Program and Performance Statement

The Restoration and Enhancement Grants program was authorized by Congress to provide operating assistance to initiate, restore, or enhance intercity passenger rail transportation. Eligible projects may include adding frequencies to existing services, establishing a new service, extending an existing service to new markets or station stops, restoring previously operated services, and offering new on-board services. Eligible recipients include states (including interstate compacts), local governments, Amtrak and other intercity passenger rail operators, and federally recognized Indian Tribes. Grantees may receive up to six years of operating assistance for a route and no more than six grants may be active under the program simultaneously. The required non-Federal match of the program increases from 10 percent in the first year of the grant to 70 percent in the sixth and final year of the grant.

EXHIBIT III-1a
FEDERAL RAILROAD ADMINISTRATION
RESTORATION AND ENHANCEMENT GRANTS
SUMMARY ANALYSIS OF CHANGE FROM FY 2022 TO FY 2023
Appropriations, Obligations, Limitations, and Exempt Obligations
($000)

	$000	**FTE**
FY 2022 CR	$4,720	0
ADJUSTMENTS TO BASE:		
Non-Pay Inflation	94	
SUBTOTAL, ADJUSTMENTS TO BASE	**94**	**0**
PROGRAM REDUCTIONS		
Other Contracts	-48	
SUBTOTAL, PROGRAM REDUCTIONS	**-48**	**0**
PROGRAM INCREASES		
Restoration and Enhancement Grants	44,734	
SUBTOTAL, PROGRAM INCREASES	**44,734**	**0**
FY 2023 REQUEST	**49,500**	**0**

Detailed Justification for the Restoration and Enhancement Grants

FY 2023 Restoration and Enhancement Grants
Budget Request
($000)

Program Activity	FY 2021 Enacted	FY 2022 Continuing Resolution	FY 2023 President's Budget
Restoration and Enhancement Grants	$4,720	$4,720	$50,000
Total	**$4,720**	**$4,720**	**$50,000**
FTE	**0**	**0**	**0**

What is this program and what does this funding level support?

The Restoration and Enhancement Grants (R&E) program provides operating assistance to initiate, restore, or enhance intercity passenger rail transportation. The R&E program has funded three projects totaling $26.8 million through FY 2020:

- $9.8 million for the Southern Rail Commission to support the restoration of service along the Gulf Coast;
- $4.4 million for Connecticut to add two weekday trains between New Haven, CT and Springfield, MA on the CT*rail* service, which began operations in June 2018; and
- $12.6 million for Wisconsin and Minnesota to add a second daily roundtrip passenger train between Union Depot in Saint Paul, MN and Union Station in Chicago, IL.

The Infrastructure Investment and Jobs Act (IIJA) reauthorized the R&E program for five years and provided a separate supplemental advance appropriation totaling $250 million as a set-aside from the $16 billion Amtrak National Network supplemental appropriation. **The FY 2023**

President's Budget requests $50 million for the R&E program, in addition to the $50 million provided in advance appropriations for FY 2023, which will advance FRA's Key IIJA Investment Goals.[1]

The $12 billion provided for projects located off the Northeast Corridor under the IIJA supplemental advance appropriation for the Federal-State Partnership for Intercity Passenger Rail (Partnership) program—together with the $555 million requested in the FY 2023 President's Budget and future year appropriations—will lead to the introduction of new and expanded intercity passenger rail corridor services across the country. The R&E program will play a vital role in the success of these services by offsetting initial operating losses while the new or expanded services build their ridership and revenue base. As experienced in Europe and recent expansions on the Amtrak network, new services and frequencies do not realize their longer-term ridership/revenue potential immediately upon initiating operations. As ridership and revenue grows over the initial years of operations, R&E funding will be gradually phased out and project sponsors will be required to comply with relevant cost-sharing methodologies (including Section 209 of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA) for any State-Supported Amtrak route).

Legislative Changes

The IIJA reauthorization made several significant changes to the R&E program, most notably:

- Extending the limitation on the number of years for which a route can receive R&E funding from three years to six years;
- Changing the non-Federal match requirements from 20 percent in the first year, 40 percent in the second year, and 60 percent in the third year to increasing increments of 10 percent starting at 10 percent in the first year to a 70 percent non-Federal match in the sixth and final year of a grant; and
- Expanding the eligible costs covered under the program from just operating expenses to include all costs that are allocated to states under the Amtrak-states cost sharing methodology required by Section 209 of PRIIA. This expansion will allow the equipment capital surcharge that states are required to pay to overhaul the Amtrak-owned equipment used in State-Supported services to be eligible for R&E grants.

The FY 2023 President's Budget proposes two additional legislative changes to ensure FRA can effectively administer the program:

- First, FRA proposes that all of the changes made to the R&E program under IIJA apply to the FY 2017 – FY 2021 funds appropriated before the law's enactment. IIJA allows previously selected R&E grants to have 6 years of funding as opposed to the 3 years originally provided under the FAST Act, but IIJA did not change the matching percentage for those previously selected routes. FRA may have difficulty implementing this provision for existing grants once their first three years of funding has been exhausted or if previously selected grantees seek additional funding for the newly eligible PRIIA 209

[1] While each FRA program often aligns with all five of FRA's Key IIJA Investment Goals, only the primary area(s) of alignment are highlighted in the callout box.

cost-share equipment capital expenses. This proposal will provide parity among current and future R&E funding recipients.

- Second, FRA proposes to strike the statutory limitation that not more than six grants can be simultaneously active. Given the level of funding provided for the R&E program under the IIJA supplemental alone, FRA may not be able to award all available funds for years if this six grant limitation remains in place.

What benefits will be provided to the American public through this request and why is this program necessary?

The R&E program plays an integral role supporting the Partnership program in improving and expanding intercity passenger rail service in the United States. Project sponsors often have greater difficulty sourcing funds to support rail operations vs. discrete capital investments. The initial operating costs required to start a new service prior to generating the longer-term projected revenues can discourage project sponsors, legislators, and other stakeholder from making the necessary commitments to deliver the service. The R&E program can help to ease this barrier to entry and ensure the substantial public benefits of expanded intercity passenger rail described under the Partnership program can be realized.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

RAILROAD CROSSING ELIMINATION PROGRAM
APPROPRIATIONS LANGUAGE

RAILROAD CROSSING ELIMINATION PROGRAM

For necessary expenses related to Railroad Crossing Elimination Grants, as authorized by section 22909 of title 49, United States Code, $245,000,000, to remain available until expended: Provided, That for projects benefitting underserved communities, as determined by the Secretary, the Federal share of total project costs may exceed 80 percent but shall not exceed 90 percent, notwithstanding section 22909(g) of title 49, United States Code: Provided further, That up to $1,000,000 shall be available for highway-rail grade crossing safety information and education programs authorized in section 22104(c) of division B of the Infrastructure Investment and Jobs Act (Public Law 117-58), and that eligible recipients for such funds shall include non-profit organizations: Provided further, That the Secretary may withhold up to 2 percent of the amount provided under this heading for the costs of award and project management oversight of grants carried out under title 49, United States Code.

Explanation of Changes: The FY 2023 President's Budget is requesting funding for this newly authorized program under the Infrastructure Investment and Jobs Act (IIJA). Proposed changes to the IIJA authorization include increasing the maximum Federal cost share from 80 percent to 90 percent for projects that benefit underserved communities.

EXHIBIT III-1
RAILROAD CROSSING ELIMINATION PROGRAM
Summary by Program Activity
Appropriations, Obligation Limitations, and Exempt Obligations
($000)

	FY 2021 ENACTED	FY 2022 CR	FY 2023 PRES. BUD.
Railroad Crossing Elimination Program	$ -	$ -	$ 245,000
Transfer to Financial Assistance Oversight and Technical Assistance	$ -	$ -	$ (4,900)
TOTAL, Base appropriations	$ -	$ -	$ 240,100
FTEs			
Direct Funded	0	0	0
Supplemental Funding			
IIJA Supplemental (Division J)			
Railroad Crossing Elimination Program	$ -	$ 600,000	$ 600,000
Transfer to Financial Assistance Oversight and Technical Assistance	$ -	$ -	$ (12,000)
TOTAL, Supplemental appropriations	$ -	$ 600,000	$ 588,000
FTEs			
Direct Funded	0	0	0
TOTAL, Account	$ -	$ 600,000	$ 828,100

Program and Performance Statement

The Railroad Crossing Elimination Program was authorized by Congress to award grants for highway-rail and pathway-rail grade crossing projects to improve safety and the mobility of people and goods. Eligible projects include grade separations and closures, track relocation, and improvements to or installation of protection devices, as well as planning, environmental review, and design of such projects. Eligible recipients include states, local governments, federally recognized Indian Tribes, local governments, public port authorities, and metropolitan planning organizations. The program requires a minimum non-Federal share of 20 percent and a minimum grant award of at least $1 million, except for planning grants. Not less than 20 percent of funds

are reserved for projects located in rural areas or Tribal lands, and at least 5 percent of this set-aside is reserved for projects in counties with 20 or fewer residents per square mile. Not less than 3 percent of funds are for planning projects, and of this amount 25 percent is reserved for projects located in rural areas or Tribal lands. Not more than 20 percent of grant funds may be awarded to projects in a single state. Additionally, 0.25 percent of funds are for highway-rail grade crossing safety information and education programs. Unless otherwise stated in appropriations language, FRA intends to use the fully authorized amounts for these set-asides.

EXHIBIT III-1a
FEDERAL RAILROAD ADMINISTRATION
RAILROAD CROSSING ELIMINATION PROGRAM
SUMMARY ANALYSIS OF CHANGE FROM FY 2022 TO FY 2023
Appropriations, Obligations, Limitations, and Exempt Obligations
($000)

	$000	**FTE**
FY 2022 CR	$0	0
PROGRAM INCREASES		
Railroad Crossing Elimination Program	240,100	
SUBTOTAL, PROGRAM INCREASES	**240,100**	**0**
FY 2023 REQUEST	**240,100**	**0**
Supplemental Appropriations	**600,000**	**0**
Transfer to Financial Assistance Oversight and Technical Assistance	-12,000	
Net, Supplemental Appropriations	**588,000**	**0**
TOTAL	**828,100**	**0**

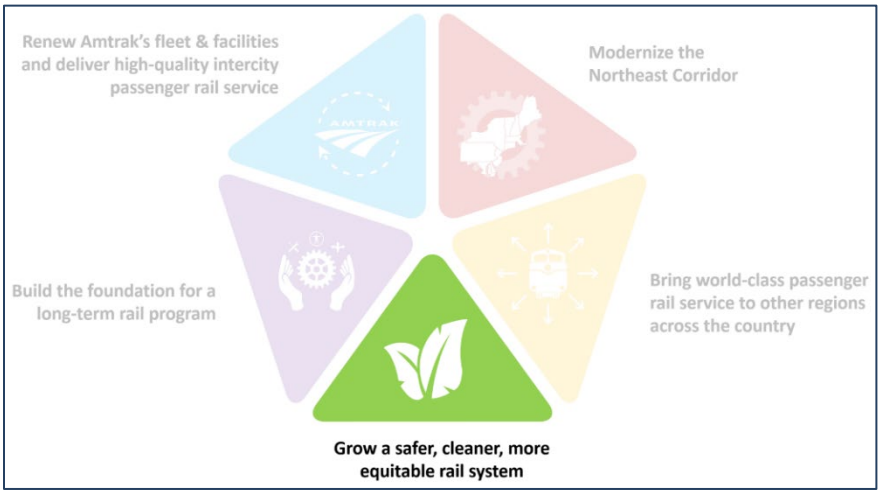
Detailed Justification for the Railroad Crossing Elimination Program

FY 2023 Railroad Crossing Elimination Program
Budget Request
($000)

Program Activity	FY 2021 Enacted	FY 2022 Continuing Resolution	FY 2023 President's Budget
Railroad Crossing Elimination Program	$0	$0	$245,000
Total	**$0**	**$0**	**$245,000**
FTE	**0**	**0**	**0**

What is this program and what does this funding level support?

The Infrastructure Investment and Jobs Act (IIJA) authorized the new Railroad Crossing Elimination program to award grants for highway-rail and pathway-rail grade crossing projects to improve safety and the mobility of people and goods. The statutory goals of the program are to:



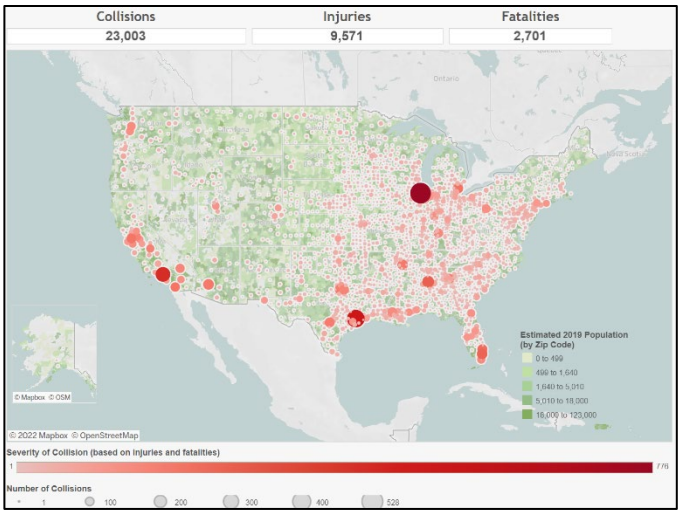
1. Eliminate highway-rail grade crossings that are frequently blocked by trains;
2. Improve the health and safety of communities;
3. Reduce the impacts that freight movement and railroad operations may have on underserved communities; and
4. Improve the mobility of people and goods.

In addition to the five-year authorization for this new program, IIJA provided an additional supplemental advance appropriation totaling $3 billion over five years. **The FY 2023 President's Budget requests $245 million for the Railroad Crossing Elimination program, in addition to the $600 million provided in advance appropriations for FY 2023,** which will advance FRA's Key IIJA Investment Goals.[1]

[1] While each FRA program often aligns with all five of FRA's Key IIJA Investment Goals, only the primary area(s) of alignment are highlighted in the callout box.

In many locations, grade separating a highway-rail crossing can result in the greatest safety improvement and benefits to both railroad and motor vehicle operations. However, grade separations can be costly to implement and there has historically been insufficient and inconsistent Federal grant funding available for such projects. For example, the Federal Highway Administration's Section 130 Railway-Highway Crossing Program has provided funding to states since 1987 to eliminate hazards at grade crossings. However, this funding—$245 million annually in the final years of the FAST Act and continued at that level through FY 2026 under IIJA—is shared among all 50 states, limiting the program's ability to address largescale projects. While FRA's CRISI and previous High-Speed Intercity Passenger Rail (HSIPR) programs have been successful in funding grade separations and other grade crossing projects, such projects were competing against other important eligible priorities within those programs.

Providing robust and dedicated funding through the Railroad Crossing Elimination program to address complex grade separations and other grade crossing improvements will have a pronounced effect on improving transportation safety. To maximize the benefits of the program, FRA intends to target resources at grade separations and improvements to groups of adjacent crossings in a corridor. To help inform its investment decisions, FRA intends to utilize the suite of analysis tools it has developed to help raise awareness regarding highway-rail grade crossing safety and analyze grade crossing safety risks and trends. Prospective applicants are encouraged to visit the FRA website to learn more about these tools,[2] which include:



- **GXDash!** – A visualization tool that captures the previous 10 years of grade crossing collision data to provide a cohesive and easily digestible snapshot of GX collisions in the United States.
- **Web Based Accident Prediction Systems (WBAPS)** – A computer model that uses (1) basic data about a crossing's physical and operating characteristics and (2) five years of accident history data at a crossing to predict collisions per year at grade crossings. This computer model is intended to serve as an analytical tool, which when combined with other site-specific information, can assist in determining where scarce highway-rail grade crossing resources can best be directed.
- **GradeDec** – A highway-rail grade crossing investment analysis tool that incorporates benefit-cost metrics for a rail corridor, a region, or an individual grade crossing. Model output allows a comparative analysis of grade crossing alternatives that are designed to mitigate highway-rail grade crossing accident risk and other components of user costs including highway delay and queuing, air quality, and vehicle operating costs.

[2] FRA Highway-Rail Grade Crossing Safety and Trespass Prevention.

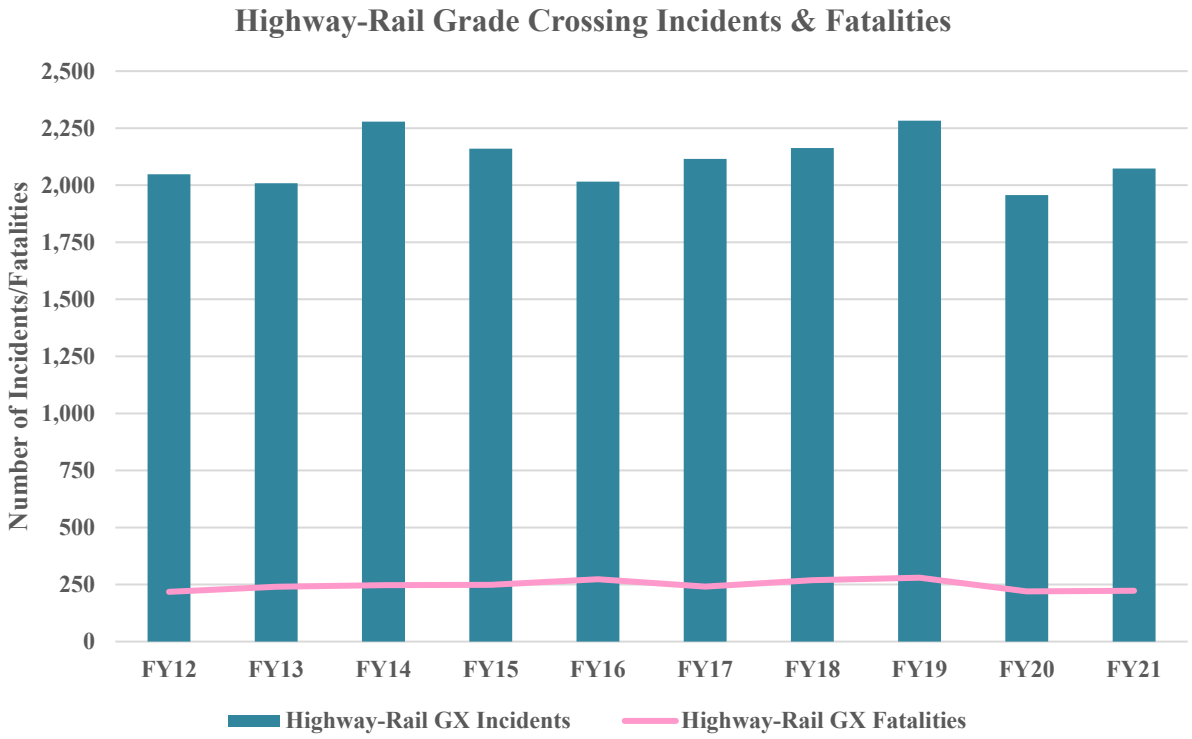
The Railroad Crossing Elimination program supports the Department's safety, economic, and equity goals. Like CRISI, the Railroad Crossing Elimination program can mitigate the safety risks and detrimental quality of life effects that rail lines can have on communities, particularly low-income areas and communities of color. Grade separating highway-rail crossings can alleviate hazards to both pedestrians and motor vehicles at crossings that experience high volumes of traffic, are poorly configured and present safety issues due to their design, or block community access due to the frequency or length of trains that pass through. To assist underserved and disadvantaged communities, the FY 2023 President's Budget proposes to reserve at least 40 percent of funding and reduce the required match from 20 percent to 10 percent for projects that benefit such communities.

In addition to the Railroad Crossing Elimination program's focus on capital projects, IIJA also requires one-quarter of 1 percent of funding be available for highway-rail grade crossing safety information and education programs. These programs are vital to improving grade crossing safety, as many grade crossing incidents are caused by motorists or pedestrians that are unaware of their surroundings and the risks posed at crossings and/or disregard grade crossing warning devices such as flashing lights and gates.

The most well-known of these programs currently are carried out by Operation Lifesaver, Inc., a non-profit that has been administering grade crossing public education and awareness campaigns for nearly 50 years. This Railroad Crossing Elimination project eligibility is ideal for Operation Lifesaver and more appropriate than FRA's Safety and Operations account, where Operation Lifesaver has historically been provided $1 million annually. The FY 2023 President's Budget proposes to allow Operation Lifesaver to receive its $1 million in annual FRA funding through the Railroad Crossing Elimination program.

What benefits will be provided to the American public through this request and why is this program necessary?

There are over 209,000 public and private grade crossings in the United States and each crossing represents a risk for a potential collision between a train and motor vehicle or pedestrian. Like many other areas of railroad safety, the number of highway-rail grade crossing incidents has markedly improved over the last 40 years—by nearly 80 percent. However, this rate of improvement has stalled over the last decade, with the number of incidents and fatalities remaining roughly flat.



During this timeframe, FRA has examined innovative and non-traditional ways to enhance grade crossing safety, including establishing a new railroad inspector discipline dedicated to grade crossings, investing in data analytics and research to identify trends and root causes, and conducting stakeholder outreach to states, local communities, and law enforcement to raise awareness of grade crossing safety issues. The missing piece to FRA's comprehensive approach to grade crossing safety has been a lack of sufficient funding to target major grade crossing risk areas on the rail network. The Railroad Crossing Elimination program will help to remedy this deficiency and build a safer rail network.

ADMINISTRATIVE PROVISIONS
APPROPRIATIONS LANGUAGE

ADMINISTRATIVE PROVISIONS – FEDERAL RAILROAD ADMINISTRATION

Sec. 150 None of the funds made available to the National Railroad Passenger Corporation may be used to fund any overtime costs in excess of $35,000 for any individual employee: Provided, That the President of Amtrak may waive the cap set in the preceding proviso for specific employees when the President of Amtrak determines such a cap poses a risk to the safety and operational efficiency of the system: Provided further, That the President of Amtrak shall report to the House and Senate Committees on Appropriations no later than 60 days after the date of enactment of this Act, a summary of all overtime payments incurred by Amtrak for [2021]*2022* and the 3 prior calendar years: Provided further, That such summary shall include the total number of employees that received waivers and the total overtime payments Amtrak paid to employees receiving waivers for each month for [2021]*2022* and for the 3 prior calendar years.

Sec. 151 The amounts made available to the Secretary or to the Federal Railroad Administration for the costs of award, administration, and project management oversight of financial assistance which are administered by the Federal Railroad Administration, in this and prior Acts, may be transferred to the Federal Railroad Administration's "Financial Assistance Oversight and Technical Assistance" account for the necessary expenses to support the award, administration, project management oversight, and technical assistance of financial assistance administered by the Federal Railroad Administration, in the same manner as appropriated for in this and prior Acts: Provided, That this section shall not apply to amounts that were previously designated by the Congress as an emergency requirement pursuant to a concurrent resolution on the budget or section 251(b)(2)(A)(i) of the Balanced Budget and Emergency Deficit Control Act of 1985.

Exhibit IV-1
Department of Transportation
FY 2023 Budget
FEDERAL RAILROAD ADMINISTRATION
Research, Development, & Technology Budget Narrative
(Budget Authority in Thousands)

Budget Account	FY 2021 Enacted	FY 2022 CR	FY 2023 Request	Applied	Technology Transfer	Facilities	Experimental Development	Major Equipment, R&D Equipment
Railroad Research and Development	**41,000**	**41,000**	**58,000**	**48,067**	**500**	**4,462**	**4,471**	**500**
Track	10,179	10,179	11,679	10,518	-	-	1,161	-
Rolling Stock	10,322	10,322	10,672	9,854	-	-	818	-
Train Control and Communication	8,086	8,086	9,086	9,086	-	-	-	-
Human Factors	6,042	6,042	6,792	6,088	-	-	704	-
Railroad Systems Issues	6,371	6,371	19,771	12,521	500	4,462	1,788	500
Safety and Operations	**4,243**	**4,891**	**4,904**	**-**	**-**	**-**	**-**	**-**
Administrative	4,243	4,891	4,904	-	-	-	-	-
Total R&D Funding, all appropriations	**45,243**	**45,891**	**62,904**	**48,067**	**500**	**4,462**	**4,471**	**500**

Exhibit IV-2
FY 2023 Budget Request – RD&T Program Funding by DOT Strategic Goal

Department of Transportation - FY 2023 Budget
Federal Railroad Administration
Research, Development, & Technology Budget
(Budget Authority in Thousands)

ACCOUNT/PROGRAM	FY 2023 President's Budget	DOT STRATEGIC GOALS					
		SAFETY	ECONOMIC STRENGTH AND GLOBAL COMPETITIVENESS	EQUITY	CLIMATE AND SUSTAINABILITY	TRANSFORMATION	ORGANIZATIONAL EXCELLENCE
Railroad Research and Development	**58,000**	**15,668**	**3,127**	**1,967**	**5,967**	**27,305**	**3,967**
Track	11,679	2,336	584	-	-	8,759	-
Rolling Stock	10,672	2,775	534	-	-	7,363	-
Train Control and Communication	9,086	1,363	454	-	-	7,269	-
Human Factors	6,792	5,742	340	-	-	710	-
Railroad Systems Issues	19,771	3,452	1,215	1,967	5,967	3,204	3,967
Safety and Operations	**4,904**	-	-	-	-	-	**4,904**
Administrative	4,904	-	-	-	-	-	4,904
TOTAL	62,904	15,668	3,127	1,967	5,967	27,305	8,871

RD&T PROGRAM NAME: TRACK PROGRAM

Objectives: The Track research program conducts scientific and engineering research to reduce track-caused derailments and thus improves railroad safety. It especially aims to prevent high-consequence derailments that cause loss of human life and significant damage to communities and property.

Fiscal Year 2021: $10.2 million
Research on track and structures continued to develop technology to help categorize the type (e.g., train traffic, vehicle, maritime, etc.) and magnitude of bridge impacts to quantify the nature of bridge strikes. Further, RD&T published and presented two ongoing research efforts to help the railroad industry better manage rail forces and prevent track buckles.

Fiscal Year 2022: $10.2 million
In FY 2022, this program continued to focus on track-caused derailments by improving inspection technology and processes and improving substructure and rail integrity assessments. Program Managers hosted the *Virtual Track Support and Substructure Symposium* (January 12, 2022) to facilitate information-sharing and increase stakeholder engagement.

Fiscal Year 2023: $11.7 million
Safety research on track structures, track components, systems performance, and systems analysis continues to reduce track-caused derailments to improve safety and minimize environmental impact. Rail performance, track inspection, and track stability research areas will use ground-penetrating radar, acoustic imaging, unmanned arial vehicles, and sensor suites to better understand rail service life and track hazards emerging from track welding, track ballast, and track geometric alignment issues. The predictive analytics research area will improve predictive modeling, and vehicle and track performance research will establish the root causes of rolling contact fatigue methodologies. Rail infrastructure research will improve the safety and state of good repair of bridges, structures, track design, and special track work. New, drone-based inspection technologies will complement existing walking and hi-rail inspection methods. Research will include coordination with the Federal Aviation Administration's Unmanned Aircraft Systems Integration Office and the rail industry.

RD&T PROGRAM NAME: ROLLING STOCK PROGRAM

Objectives: The focus of the Rolling Stock (RS) research program is to reduce derailments due to equipment failures, minimize the consequences of derailments, and minimize hazardous material (HazMat) releases to improve railroad safety. The program will investigate efficacy of clean energy and advanced motive power technologies to improve energy efficiency and reduce rail transport emissions.

Fiscal Year 2021: $10.3 million
RS completed Train Energy and Dynamics Simulator (TEDS) work and air brake rack tests as part of the very long trains (VLT) study, focusing on train makeup, train operations, and train

handling developments. Best practices were captured for wayside technology systems; research collaboration included installations at two railroads and the New York Metropolitan Transit Authority. RD&T continued its research to develop and improve HazMat packages. Congress appropriated $2.5 million for FRA to research and mitigate risks associated with the transportation of cryogenic fuel and other hazardous materials – including tank car research – in partnership with other Federal agencies.

Fiscal Year 2022: $10.3 million
RS will continue its mission to reduce accidents and improve efficiency through applied research in HazMat transportation, in partnership with Pipeline and Hazardous Materials Safety Administration and Maritime Administration. Research of VLTs through the continuation of a multi-phase VLT brake research project in collaboration with BNSF Railway.

Fiscal Year 2023: $10.7 million
In FY 2023, RS research will continue to improve safety and environmental mitigation. RS will collaborate with stakeholders to study HazMat tank car failure modes and crash survivability by modeling and destructive testing, disseminating findings, and updating regulations to improve tank car safety. RS will continue to model in-train forces with TEDS to reduce accident rates. Research on temperature detection and modeling techniques will yield better-performing components that are less likely to fail. Research in railcar passenger safety will continue to test fire-resistant railcar material, egress scenarios, structural integrity, and passenger locomotive crashworthiness.

RD&T PROGRAM NAME: TRAIN CONTROL AND COMMUNICATION PROGRAM

Objectives: The Train Control and Communication (TC&C) research program objectives are to improve railroad operation safety, reduce train-to-train collisions and train collisions with objects on the line and at grade crossings, and prevent trespassing. This program adapts innovative and emerging technologies from other industries to support its mission and provides stakeholders the benefits of its research through Technology Transfer.

Fiscal Year 2021: $8.1 million
Phase 2 of the Wireless Communication Road Map project provides coordinated use and management of the interoperable Positive Train Control (PTC) communication network. RD&T worked with universities, industry, railroads, and the public sector to explore new areas where technologies (such as PTC) and innovative devices can play a role in increasing safety at grade crossings. TC&C continued its collaboration with Operation Lifesaver and formed an international working group on railroad trespass prevention.

Fiscal Year 2022: $8.1 million
In FY 2022, PTC next generation research will identify and develop the methods, facilities, equipment, and capabilities required for providing future industry PTC development. RD&T will evaluate the development of automation technologies to improve grade crossing safety and the development of rail industry-driven standards for communicating grade crossing status to connected or automated vehicles. This Intelligent Transportation Systems research area builds on 49 CFR Part 234 Grade Crossing Safety and Part 924 Highway Safety Improvement Program.

Fiscal Year 2023: $9.1 million
Interoperability research will develop efficient and reliable controls and automated verification among railroads. TC&C will support the testing and evaluation of cellular vehicle-to-everything communication protocols. TC&C will also publicly demonstrate the feasibility and performance of a rail crossing violation warning system. Collaboration will continue with the Intelligent Transportations Systems Joint Program Office.

TC&C will work with stakeholders to develop new tools and technologies for addressing trespassing on railroad rights of way (ROW). A grade crossing database to house the 3D grade crossing scans collected by the Automated Track Inspection Program car will be developed, along with new accident prediction and severity models for grade crossings and models for studying behavior in general at grade crossings. Educational tools will be disseminated to the public, including local and state governments, law enforcement agencies, and schools. TC&C will continue to coordinate with the Human Factors (HF) division and Operation Lifesaver, and will also establish an international working group for trespass prevention.

RD&T PROGRAM NAME: HUMAN FACTORS PROGRAM

Objectives: The Human Factors (HF) research program improves rail safety by examining the interactions of human operators with railroad systems, reducing the potential for human error in railroad operations. The program develops decision support and planning tools, assesses automation and human-machine interface designs; advocates for human systems integration within the railroad industry; and works with stakeholders to improve safety culture.

Fiscal Year 2021: $6.0 million
RD&T and the Office of Railroad Safety (RRS) held two, one-day Railroad Trespass Prevention and Grade Crossing Technology conferences in the two U.S. counties with the most trespass fatalities on rail ROW to highlight the dangers and impact of trespassing, seek low-cost solutions to local issues, and discuss practicable technological improvements. In addition, HF provided support to Short Line Safety Institute's (SLSI) completion of nine safety culture assessments in CY 2021 and training to Class II and Class III railroads.

Fiscal Year 2022: $6.0 million
In 2022, the HF program will continue to address railroad employee performance, grade crossing safety, trespassing mitigation, and suicide prevention. HF will collaborate with ENSCO, Inc. and railroad networks to analyze commercially available, anonymized cell phone location data to further understand trespassing behaviors and develop better deterrent measures. In addition, Congress appropriated funds to improve safety practices and training and develop safety management systems for Class II and Class III freight railroads.

Fiscal Year 2023: $6.8 million
In 2023, the HF program will continue to support the DOT goal of having the safest transportation network in the world by reducing the potential for human error in railroad operations. HF will research head-up display interface designs that support human-automation teaming to help further automated systems. SLSI funding will continue, including an evaluation

to assess safety culture change at participating railroads. Collaboration with RRS on the Rail Information Sharing Environment (RISE) will determine the feasibility and scalability of a safety data trust for the railroad industry. Research on grade crossing safety and trespasser mitigation continues, with studies into motorist and trespasser behavior. Coordination with the Global Railway Alliance for Suicide Prevention Program (GRASP) and Operation Lifesaver will mitigate and prevent trespassing and suicide attempts. HF will work with NASA to analyze the Confidential Close Call Reporting System (C^3RS) data, and work with NASA and RRS to conduct an evaluation of the C^3RS program, consistent with the Evidence Act.

RD&T PROGRAM NAME: RAILROAD SYSTEMS ISSUES PROGRAM

Objectives: The Railroad Systems Issues (RSI) program prioritizes R&D projects on the basis of relevance to safety risk reduction, climate change and energy efficiency, equity, and other DOT goals.

Fiscal Year 2021: $6.4 million
RD&T published a Research Results report of its first workforce development survey of the railroad industry to capture and analyze workforce data on trends, challenges, and industry best practices. Three university science, technology, engineering, and math (STEM) initiatives were funded to encourage K-12 students' participation in STEM and to promote careers in rail. Partnered with RRS and industry on RISE. The RSI program also managed infrastructure investments to enhance Transportation Technology Center (TTC) research capabilities and equipment.

Fiscal Year 2022: $6.4 million
Collaborating with the Department of Energy and the Environmental Protection Agency, RSI continues research on electric batteries, hydrogen, and fuel cell technologies; cryogenic fuels; biofuels; and renewable biodiesel. RSI also continues research on workforce challenges in the railroad industry. STEM programs and outreach to minority-serving institutions (MSIs) and historically black colleges and universities (HBCUs) initiated in FY 2021 continue. To address equity in rail, Broad Agency Announcement (BAA) research addresses underrepresented groups in the railroad industry.

Moreover, the Secretary is authorized to allocate up to $3 million annually under the R&D account to be used to erect, alter, and repair buildings and make other improvements at TTC. Funding will also advance new energy and emissions research, which could improve energy efficiency, hasten the transition from traditional diesel fuel locomotives, and spur the development and deployment of low- or no-emission technologies. RSI is also undertaking initiatives to support Workforce Development (WFD) activities, including working with MSIs, and new efforts to address diversity, equity, and inclusion in the railroad workforce.

Fiscal Year 2023: $19.7 million
WFD research activities will address challenges with inclusion and diversity in rail. Research includes industry-wide WFD surveys, projects to attract and retain under-represented people in rail, and funding STEM programs to encourage underrepresented populations to pursue rail-related careers. A WFD consortium will engage industry stakeholders to address workforce

trends, share data, and provide insights. University partnerships will focus on MSIs and HBCUs. BAAs will seek innovative ideas from vendors and universities and support the development of a center of excellence and a National Railroad Institute. Research will improve rail accessibility standards, and explore applications for impaired or challenged rail passengers. In collaboration with RRS, RSI is planning a second climate and sustainability conference, including international participants that will advance clean energy solutions for railroad applications. This workshop will bring together experts, industry, international partners, and Federal agencies to discuss technologies for the decarbonization of rail. RD&T plans to complete the development and prototype demonstration of hybrid systems and clean energy. Moreover, infrastructure investments will enhance TTC's capabilities and capacity, and address maintenance requirements needed to meet current and future research and test activities.

INFORMATION TECHNOLOGY
DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
BUDGET AUTHORITY

($000)

Budget Account	FY 2021 Enacted	FY 2022 CR	FY 2023 President's Budget
Safety and Operations			
Commodity IT SS WCF	$13,735	$15,962	$17,786
Modal IT	$25,650	$17,162	$16,097
Total	**$39,385**	**$33,124**	**$33,883**

The Federal Railroad Administration (FRA) is requesting **$33.88 million** in FY 2023 for information technologies (IT) that support the full spectrum of FRA programs as well as the Department's initiative to transform and consolidate the management of certain IT solutions centrally by the Office of the Chief Information Officer (OCIO).

Commodity IT Shared Services (SS) through the Working Capital Fund

OCIO will continue to provide all modes Commodity IT Shared Services in FY 2023 to achieve economies of scale and increase consistency of cybersecurity protections across the Department. Commodity IT Shared Services include IT functions and activities dedicated to basic support services, including network operations, end-user computing, telecommunications services, and server operations.

- FRA requests **$33.88 million** from the Safety and Operations account, of which **$17.79 million** is for Commodity IT Shared Services. FRA's share was based on actual commodity IT consumption in prior years as well as planned future consumption. OCIO, in collaboration with FRA, assumed a one-to-one cost estimate to transition all commodity IT to OCIO. FRA will only be charged for services rendered.

Modal IT

The following major mission-critical IT systems will be maintained by FRA in FY 2023. This list is only a subset of all IT systems that support FRA and are reported in OMB's the CIMS.

- **Railroad Safety Information System (RSIS)** - FRA requests **$4.5 million** from Safety and Operations for development, modernization, and enhancement (DME) and operation and maintenance (O&M) of FRA's RSIS. RSIS is a data management program comprised of the people, processes, and tools required to support the collection, processing, delivery, reporting, and analyzing of railroad safety and safety-related data. RSIS supports the fundamental FRA safety mission through data and data-driven decision-making processes; enables analysis of safety data for identification of safety issues and trends, prioritization of programs, regulatory reform, and resource planning; enables risk analysis and quiet zone establishment; supports policies and research (R&D) throughout the rail industry; directly supports the Rail Compliance System program; and provides the authoritative safety data source that preserves historical data.

- **Automated Track Inspection Program (ATIP)** - FRA requests **$1.4 million** from Safety and Operations for DME and O&M of FRA's ATIP to ensure track safety, support FRA's vision of "ensuring the safe, reliable, and efficient movement of people and goods for a strong America, now and in the future" by developing and advancing inspection technologies and also using these technologies in compliance programs for identification of deteriorating and substandard track conditions.

- FRA requests **$5.6 million** from Safety and Operations for DME and O&M for the remaining IT support and systems staying within the mode, such as Railroad Safety Inspection Tools, GrantSolutions, Railroad Network Systems, Web Information Services, Business Intelligence, and Rail Compliance System.