

Northeast Corridor Annual Report: Infrastructure and Operations

Fiscal Year 2022

March 2023



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A report by the
Northeast Corridor Commission

In partnership with:

Massachusetts Department of Transportation (MassDOT)

Massachusetts Bay Transportation Authority (MBTA)

Rhode Island Department of Transportation (RIDOT)

Connecticut Department of Transportation (CTDOT)/CTrail

Metropolitan Transportation Authority (MTA)

MTA Metro-North Railroad (Metro-North)

MTA Long Island Rail Road (LIRR)

New Jersey Transit (NJ TRANSIT)

Southeastern Pennsylvania Transportation Authority (SEPTA)

Pennsylvania Department of Transportation (PennDOT)

Delaware Department of Transportation (DelDOT)

Maryland Department of Transportation (MDOT) Maryland Transit
Administration (MTA) / Maryland Area Regional Commuter (MARC)

District Department of Transportation (DDOT)

Virginia Railway Express (VRE)

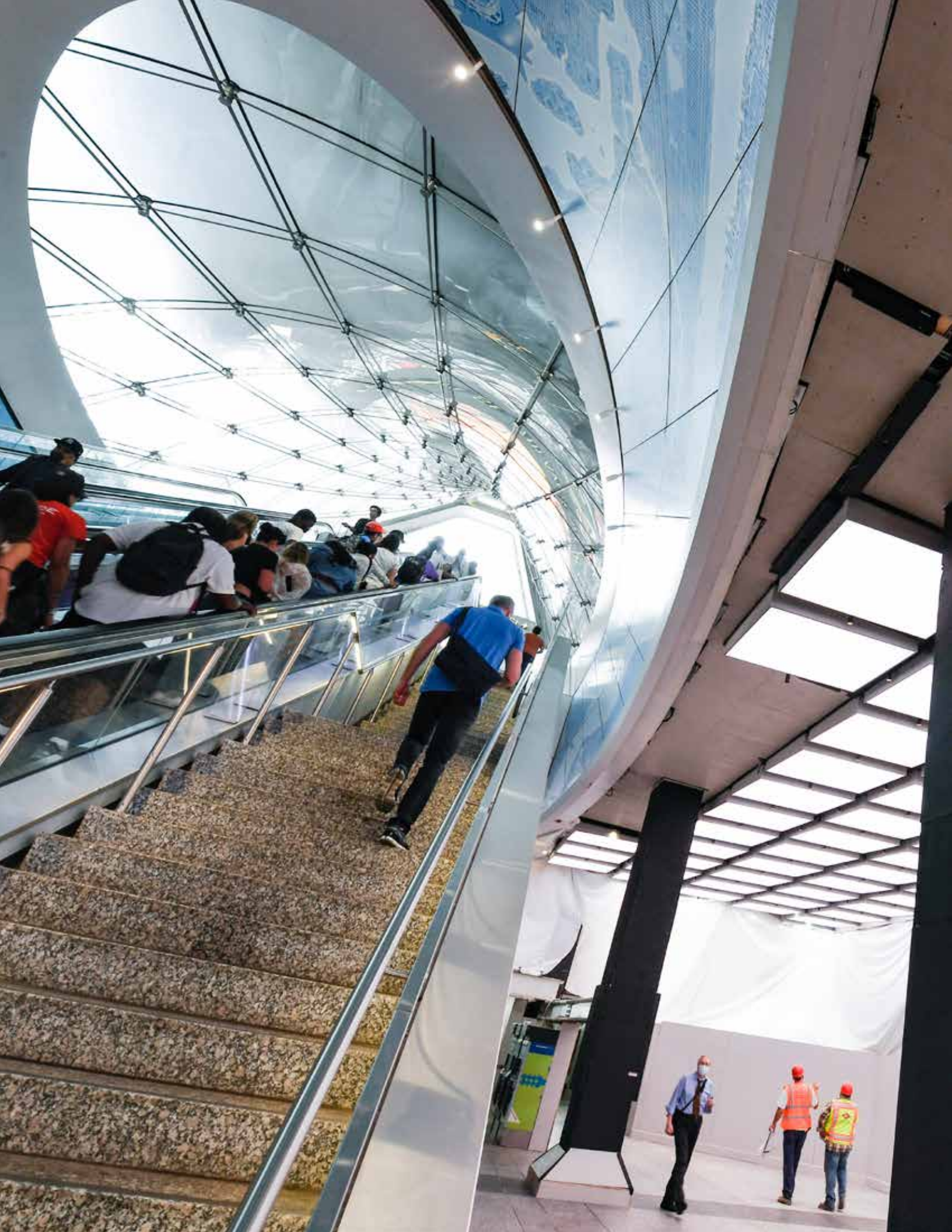
Amtrak

U.S. Department of Transportation (USDOT)



Contents

Letter from the Executive Director	1
Executive Summary	2
1. Introduction	5
Northeast Corridor-Wide Summary	5
Background	6
2. Infrastructure	10
FY22 Progress and Accomplishments	12
Measuring Plan Adherence Beyond Expenditures	16
Delivering Year One of the FY22-26 NEC Capital Investment Plan	18
Progress in Assessing and Eliminating the State-of-Good-Repair Backlog	24
3. Operations	30
Service and Ridership	30
Train Performance	33
4. Challenges and Recommendations	38
Project Information Appendix	43



Letter from the Executive Director

The Northeast Corridor is a vital transportation asset that connects people with friends and family, goods and services, and economic opportunity. The passage of the Infrastructure Investment and Jobs Act (IIJA) and its historic levels of funding create an incredible opportunity for NEC infrastructure owners and service operators to meaningfully reduce the state-of-good-repair backlog and ensure that intercity and commuter rail services are better, faster, more frequent, and more reliable in the future.

The NEC Annual Report for federal fiscal year 2022—from October 1, 2021 through September 30, 2022—provides insight on the current state of infrastructure investment, ridership trends, and train performance. The findings in this year's report show record levels of infrastructure investment and indicate rebounding ridership and service levels, although ridership remains well below pre-pandemic levels. These indicators of strength are a direct result of the federal support that NEC Commission member agencies received during the pandemic to ensure that investment and service levels continued to meet the needs of customers.

Looking ahead, the NEC Commission is cognizant of the fact that implementing the CONNECT NEC plan and investing the funds provided in IIJA will be a significant challenge for infrastructure owners and other project sponsors. While the corridor achieved record levels of capital investment in FY22, spending levels continued to fall below planned amounts. A significant ramp-up of investment is needed and agencies are hiring workforce and reorganizing to prepare for the challenge ahead.

The Commission remains focused on supporting its member agencies in achieving the ambitious investments and service goals set forth in the 15-year CONNECT NEC Program. This work requires continued and enhanced collaboration, transparency, and accountability as we advance solutions for program implementation coordination, internal reforms, and workforce development.

NEC Commission member agencies are resolved to meet this formidable challenge. We look forward to working with Congress and the Administration to ensure that the nation's busiest passenger rail corridor meets the needs of today's riders and generations to come.

Mitch Warren
Executive Director
Northeast Corridor Commission

Executive Summary

Federal fiscal year 2022 (FY22) spans October 1, 2021 through September 30, 2022—a period that included pandemic setbacks and signs of recovery. Northeast Corridor operators and project sponsors reacted to changing conditions throughout the fiscal year, with project sponsors still delivering over \$2 billion worth of infrastructure investment and operators returning additional trains back to service for a growing number of customers.

Infrastructure

NEC project sponsors invested over \$2.2 billion in infrastructure in FY22, above FY21 investment of \$1.9 billion but below the \$3.0 billion approved in the FY22-26 Capital Investment Plan.

Collective NEC infrastructure investment grew from \$1.9 billion in FY21 to \$2.2 billion in FY22—the highest level of investment since the Commission began publishing the NEC Annual Report. NEC project sponsors completed several construction projects and made advancement in pre-construction on other projects, with many anticipated to enter construction in FY23. NEC operators also continued their commitment to the NEC Cost Allocation Policy, providing a reliable funding stream for capital renewal activities shared based on each operator's relative use of NEC infrastructure.

While FY22 featured record-high capital investment, the total \$2.2 billion in expenditure fell short of the planned \$3.0 billion investment (74% of planned expenditure) documented in the approved FY22-26 CIP. Project sponsors always have to adapt to changing conditions that affect infrastructure delivery, but the Commission remains focused on understanding and improving plan adherence and achieving the ambitious increase in annual investment required to implement the FY23-27 CIP and the 15-year CONNECT NEC Program.

With additional IIJA funds becoming available in FY23, measuring plan adherence is more important than ever. The Commission will work with all RoW owners and project sponsors to develop more comprehensive metrics to measure plan adherence to provide a richer picture of capital program delivery progress and efficiency. This effort will require some Commission member agencies to reform internal systems to provide reliable cost, schedule, track outage, and production unit data without burdensome manual data gathering processes.

Operations

Service and ridership levels continue to rebound, ending FY22 with the highest observed levels since the coronavirus pandemic began.

The Northeast Corridor has been and remains the busiest rail corridor in the United States. The NEC was expected to break ridership and service records in FY20 before the pandemic outbreak. After some recovery, ridership saw another decline in October 2021, dropping to 343,000 weekday trips in January 2022 with the peak of omicron infections. Ridership then rebounded, ending FY22 with over 593,000 weekday trips (62% of pre-pandemic trips)—the highest since March 2020. By the end of FY22, trips on the NEC grew by 37% from the prior fiscal year.

NEC operators have continued to incrementally increase service closer to pre-pandemic levels. NEC service featured 1,997 daily intercity and commuter trains by the end of FY22, roughly 93% of pre-pandemic service. NEC service grew by over 8% from the prior fiscal year.

Increase in service brings back challenges to maintaining the relatively high levels of reliability experienced during the pandemic.

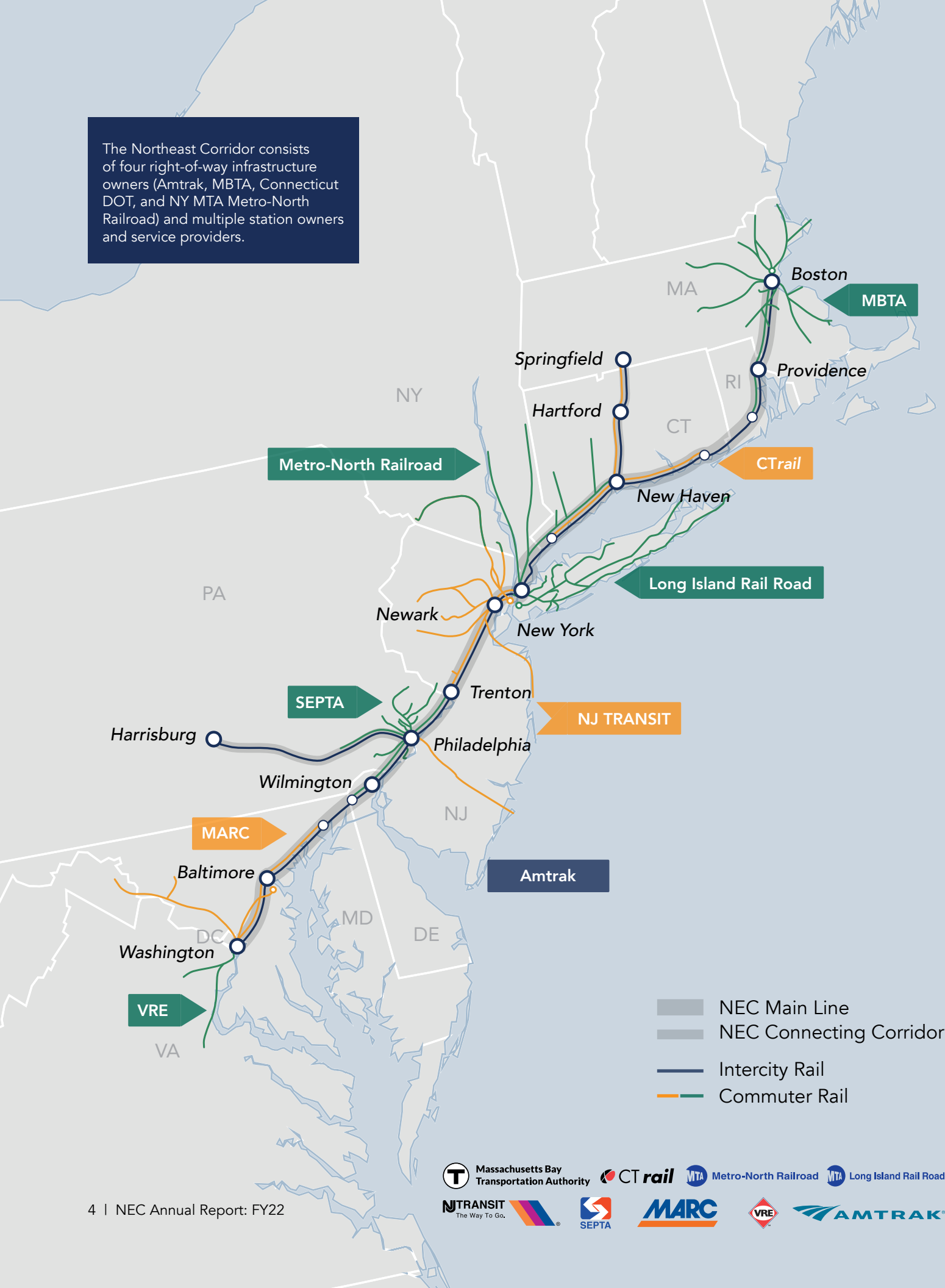
NEC train service has generally been more reliable since the start of the pandemic, largely due to lower service levels that create fewer opportunities for delays to occur. Roughly 7.5% of NEC trains arrived late, annulled, or were terminated in FY22, an increase from 6.4% of trains in FY21, but below 11.0% of trains in FY19.

Infrastructure, mechanical, and transportation remain the top three categories of delay. Infrastructure delays accounted for 26% of all train-delay minutes in FY22, including delays from failures of specific assets, programmed maintenance, and speed restrictions. Major service incidents increased in FY22 largely due to the return of more trains into service. Nearly a third of FY22's major service incidents were infrastructure-related, most of which were due to catenary failures.

Challenges and Recommendations

Commission members are poised to usher in an historic era of reinvestment in the Northeast Corridor thanks to unprecedented federal funding support from IIJA. However, Commission members face challenges in ramping up their level of investment each year, and identifying and executing strategies to promote stronger adherence to project schedules and budgets. Recommendations in this report include the Commission's Implementation Coordination Program (ICP), Commission member internal reforms, and workforce development.

The Northeast Corridor consists of four right-of-way infrastructure owners (Amtrak, MBTA, Connecticut DOT, and NY MTA Metro-North Railroad) and multiple station owners and service providers.



- NEC Main Line
- NEC Connecting Corridor
- Intercity Rail
- Commuter Rail



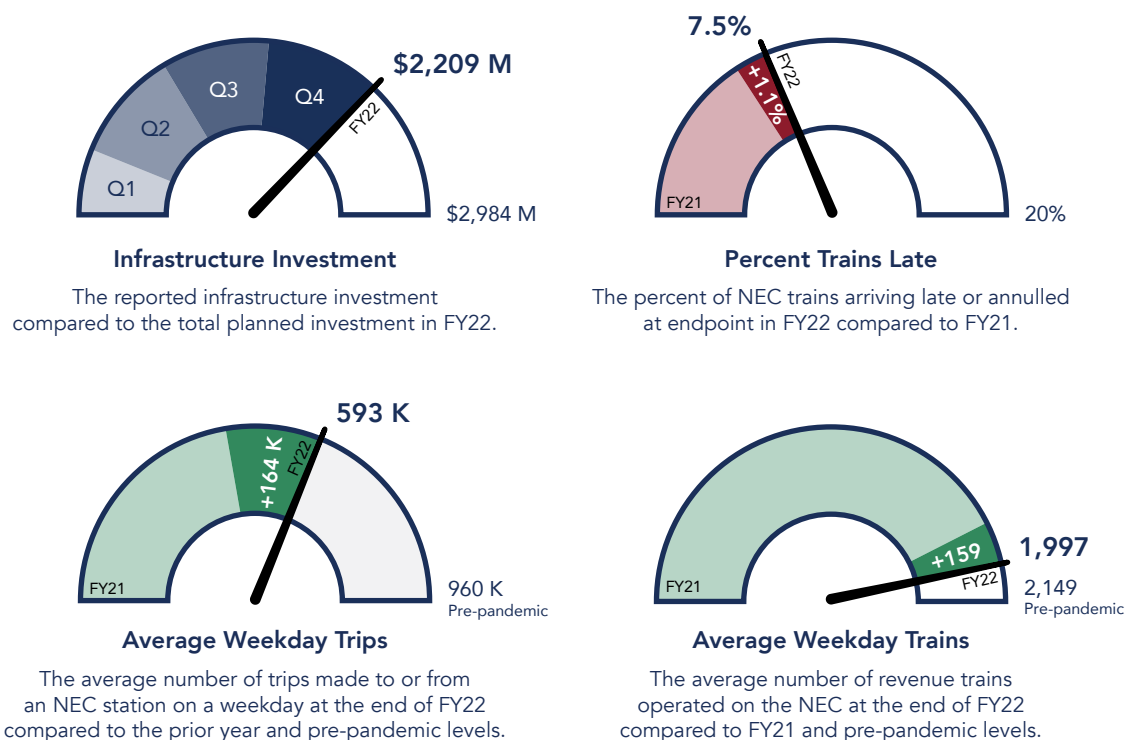
1. Introduction

Northeast Corridor-Wide Summary

Federal fiscal year 2022 (FY22) spans October 1, 2021 through September 30, 2022—a period that included pandemic setbacks and signs of recovery. The start of the fiscal year saw the emergence of the delta and omicron variants of the coronavirus, which negatively affected the health and well-being of the workforces delivering vital infrastructure investments, as well as the riders that depend on intercity and commuter passenger rail.

Northeast Corridor operators and project sponsors reacted to changing conditions throughout the fiscal year, with project sponsors still delivering over \$2 billion worth of infrastructure investment and operators returning additional trains back to service for a growing number of customers.

Figure 1-1. FY22 metrics at a glance



Background

The Northeast Corridor

The Northeast Corridor—both the NEC main line from Boston, MA to Washington, DC and connecting corridors to Harrisburg, PA; Spuyten Duyvil, NY; and Springfield, MA—hosts the passenger rail operations of eight commuter railroads, Amtrak’s intercity services, and six freight railroad services. The NEC, long the nation’s busiest passenger railroad, has been a cornerstone of the region’s development and continues to be a driver of its economic success. NEC ridership peaked in 2019 with nearly one million daily trips—930,000 on commuter rail and 57,000 on Amtrak’s intercity services.

The 457-mile main line still includes many bridges and tunnels that date back to the period between the Civil War and the New Deal. The NEC’s state-of-good-repair (SOGR) backlog must be addressed to prevent further impacts to service reliability, which can jeopardize the economic well-being of the Northeast region and the entire nation. Fortunately, the historic Infrastructure Investment and Jobs Act (IIJA) includes tens of billions of dollars for rail and transit investments and required the Federal Railroad Administration to develop an NEC Project Inventory to fund a predictable pipeline of NEC infrastructure investment.

While the coronavirus pandemic dramatically reduced all travel and created economic uncertainty, Amtrak and commuter agencies were able to survive thanks to emergency federal support, and in some cases capital plan adjustments and responsiveness to changing service demands. The FY21 NEC Annual Report documented that service levels and ridership have increased since their lows in March 2020, and the Northeast Corridor Commission expects rail travel to continue to be a critical mode of travel for many people, including those without access to a car. Capital investment can both ensure the future viability of this service and contribute to the continued recovery from the pandemic’s economic challenges.

The NEC Commission

The Northeast Corridor Commission was authorized by Congress in 2008 (49 U.S.C. § 24905) to develop coordinated strategies to improve the Northeast's core rail network in recognition of the inherent challenges of planning, financing, and implementing major infrastructure improvements that cross multiple jurisdictions. The expectation is that by coming together to take collective responsibility for the NEC, Commission member agencies will achieve a level of success that far exceeds the potential reach of any individual organization.

The Commission is comprised of one member from each of the NEC states (Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, and Maryland) and the District of Columbia; four members from Amtrak; and five members from the U.S. Department of Transportation. The Commission also includes non-voting representatives from four freight railroads, states with connecting corridors, and several commuter operators in the region.

The NEC Commuter and Intercity Rail Cost Allocation Policy

The Cost Allocation Policy was adopted by the Commission in September 2015 and renewed in October 2020. The Policy outlines a partnership built on three pillars: (1) operator cost sharing; (2) transparency, collaboration, and accountability; and (3) federal partnership.

The key components of the transparency, collaboration, and accountability pillar include NEC planning and reporting processes to develop and update the 15-year CONNECT NEC Program and the five-year Capital Investment Plan (CIP). These processes are intended to enhance coordination on service goals, associated capital investments, and the resources required to implement them. CONNECT NEC identifies long-term service objectives and associated capital investments over the next 15 years, while the annual CIP demonstrates how the Commission and its member agencies plan to advance CONNECT NEC in the near-term.

The Policy also requires the first federal fiscal year of the CIP to be an implementation plan constrained by available funding and resources. The implementation plan is a valuable tool for collaboration, transparency, and accountability among Commission member agencies. The first year of the CIP, as agreed to and approved by the Commission, serves as the baseline for infrastructure delivery reporting and is summarized each year in the NEC Annual Report.

Infrastructure delivery reporting is meant to establish a uniform understanding of capital activities and support greater accountability between all parties.

The NEC Annual Report is called for in the Policy and required by statute. The NEC Annual Report summarizes corridor activity during the prior federal fiscal year, including train operations and performance, ridership and service trends, infrastructure delivery, and progress in assessing and eliminating the NEC state-of-good-repair backlog. The Annual Report may also include recommendations on these subjects, as appropriate.

Figure 1-2. NEC Commission plans and reports



CONNECT PROGRAM

A 15-year plan with the long-term vision for a modern and resilient railroad with safe, reliable, and more frequent service; connections to new markets; and reduced travel times between communities.

Capital Investment Plan

A five-year plan that integrates NEC agencies' planned infrastructure investment detail. Year One of the CIP serves as an implementation plan and the baseline for infrastructure delivery reporting.

Annual Report

A report that documents the operational performance of NEC trains and the delivery of Year One of the CIP.

2. Infrastructure

The Commission approved the FY22-26 NEC Capital Investment Plan (CIP) in October 2021, which identified each agency's capital investments planned for federal fiscal year 2022 based on available funding known at the time. This section summarizes the capital investments made by NEC owners and project sponsors during FY22, including notable progress and accomplishments and adherence to plan.

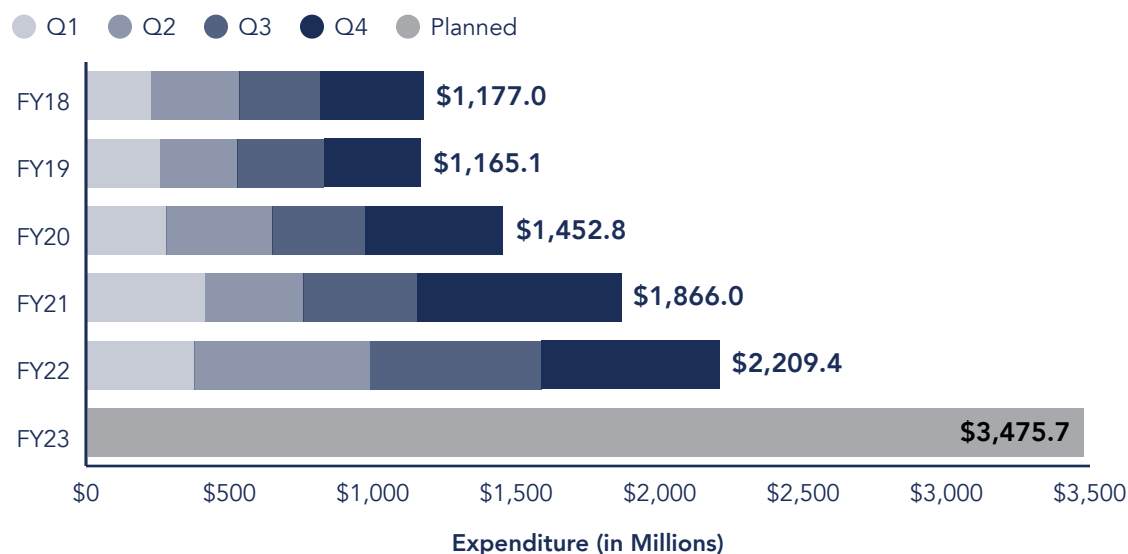
NEC project sponsors invested over \$2.2 billion in infrastructure in FY22, above FY21 investment of \$1.9 billion but below the \$3.0 billion approved in the FY22-26 CIP.

Collective NEC infrastructure investment grew from \$1.9 billion in FY21 to \$2.2 billion in FY22—the highest level of investment since the Commission began publishing the NEC Annual Report (see Figure 2-1).

Investments across the corridor included a mix of project types, including major backlog, capital renewal, improvement, and stations projects. The top ten FY22 investments by dollar value total \$1.2 billion, or 52% of all FY22 expenditures. These high-dollar-value investments are a mix of project types and are concentrated in the New York City Metro region. NEC project sponsors completed several construction projects in FY22 and made advancement in pre-construction on other projects, with many anticipated to enter construction in FY23.

NEC operators also continued their commitment to the NEC Cost Allocation Policy in FY22, providing a reliable funding stream for capital renewal activities shared based on each operator's relative use of NEC infrastructure. Right-of-way owners invested \$707.0 million, or 32% of all FY22 expenditures, toward these eligible capital renewal investments.

Figure 2-1. FY18-22 actual infrastructure investment by year and quarter vs. FY23 planned expenditure (millions)



While FY22 featured record-high capital investment since the Commission began publishing the NEC Annual Report, the total \$2.2 billion in expenditure fell short of the planned \$3.0 billion investment documented in the approved FY22-26 CIP. Project sponsors always have to adapt to changing conditions that affect infrastructure delivery, but the Commission remains focused on understanding and improving plan adherence and achieving the ambitious increase in annual investment required to implement the FY23-27 CIP and the 15-year CONNECT NEC Program.

Infrastructure Investment and Jobs Act

Enactment of Infrastructure Investment and Jobs Act (IIJA) in November 2021 allows for historic levels of investment in the NEC and means decades of deferred NEC investments can now move forward. Through IIJA, many of the federal funding sources received an increase in their annual authorization amount along with an additional amount of guaranteed appropriations.

In FY22, the Federal Railroad Administration worked towards creating the NEC Project Inventory, which was published in November 2022 (i.e., in FY23). The NEC Project Inventory creates a project pipeline and will guide at least \$24 billion in IIJA funding. The first round of NEC awards for the Federal-State Partnership for Intercity Passenger Rail Grant Program are expected to occur later in FY23.

FY22 Progress and Accomplishments

By quarter. The ability to undertake work on the NEC can vary by season, with the summer months typically being the most productive for construction work. FY22 investments were consistent with this seasonality with nearly 45% of investments occurring the first half of the federal fiscal year from October through March and the remaining 55% during the warmer months from April through September (see Figure 2-1). The last quarter of the year, which corresponds with the busiest production season, saw the largest quarterly expenditure (\$621.3 million).

By region. Roughly half of FY22 investment was planned for and occurred in the New York City Metro region (between New Rochelle, NY and Trenton, NJ), totaling \$1,140.5 million (see Figure 2-2). The New York City Metro region includes several critical projects, such as Portal North Bridge, Penn Station Access, New York Penn Station LIRR Concourse, and Harold Interlocking. The remainder of the total investment was split among the other NEC regions.

Figure 2-2. FY22 infrastructure investment by region (millions)

Region	FY22 Planned Expenditure	FY22 Actual Expenditure	FY22 Percent of Plan Spent	FY21 Actual Expenditure	Percent Change Actual Expenditure (FY21 to FY22)
New England	\$196.3	\$132.6	68%	\$124.8	+6%
Connecticut-Westchester (NHL)	\$420.8	\$209.3	50%	\$300.8	-30%
New York City Metro	\$1,378.8	\$1,140.5	83%	\$935.1	+22%
Mid-Atlantic North	\$299.2	\$294.2	98%	\$208.0	+41%
Mid-Atlantic South	\$384.1	\$262.9	68%	\$156.6	+68%
Amtrak System-wide	\$305.0	\$169.9	56%	\$140.7	+21%
Total	\$2,984.1	\$2,209.4	74%	\$1,866.1	+18%

Project sponsors across the NEC closed out FY22 by clearing key pre-construction milestones to prepare projects to enter the construction phase. For example, Rhode Island DOT and Amtrak began construction on customer-facing, state-of-good-repair work at Providence Station, while NJ TRANSIT awarded a contract and issued a notice to proceed for Phase 1 of its Delco Lead project to bolster the resiliency of operations during severe weather events. These milestones represent extensive collaboration among infrastructure owners, operators, and key stakeholders in solidifying designs, securing permits, and awarding contracts—all in the name of improving reliability and service for riders on the NEC.

Shore Line East trains in Connecticut began electrified service in May 2022, a result of years of capital improvement work. The switch from older diesel-powered trains to the new M8 electric trains provides a better customer experience, faster speeds, and improved reliability, while addressing climate concerns.

Shared Capital Renewal Investments. Right-of-way owners invested \$707.0 million in programs and projects that are eligible for the Baseline Capital Charges (BCCs) contributed by each NEC operator for their relative use of NEC infrastructure, as directed by the NEC Cost Allocation Policy (see Figure 2-3). Amtrak, Connecticut DOT, and Metro-North invested an additional \$77.3 million in eligible investments above and beyond operators' BCC contributions.

Figure 2-3. FY22 BCC-eligible capital renewal infrastructure investment by RoW owner (millions)

RoW Owner	FY22 Actual Expenditure	FY22 BCC Obligation	FY22 BCC Obligation Met
Amtrak-owned territory ¹	\$580.3	\$505.6	☑
MBTA-owned territory	\$16.3	\$28.3	⊗
Connecticut DOT-owned territory	\$94.3	\$90.5	☑
MTA Metro-North-owned territory	\$16.1	\$16.1	☑
Total BCC-eligible Investment	\$707.0	\$640.5	

Note: (1) BCC obligation is subject to revision per Amtrak-MTA Long Island Rail Road Agreement

Figure 2-4. Map of FY22 accomplishments

- ✓ Highlighted Project Completions
- C Highlighted Capital Renewal Production Program Activity

Middletown Station Improvements

Pennsylvania DOT and Amtrak completed construction of a new station in Middletown, PA on the Harrisburg Line. The new station features a high-level platform, ADA accessibility, and improved multimodal connectivity.



Undergrade Bridge Rehabilitation and Retaining Wall Construction

MTA Metro-North completed the rehabilitation of two undergrade bridges at Willet Ave and Highland St, as well as a retaining wall in Port Chester, NY. The rehabilitated structures will ensure safe operations are maintained through a busy section of the corridor.

Fair Interlocking Renewal Project

Amtrak, in conjunction with NJ TRANSIT and SEPTA, completed renewal of Fair Interlocking in Trenton, NJ. The project renewed the track, catenary, and signal systems at the interlocking which will improve reliability.

PA Capital Renewal

Two tracks at Philadelphia 30th Street Station were replaced due to the severe deterioration of the concrete and block ties. The existing track infrastructure required a complete demolition and replacement of 2,000 block ties by Amtrak.

NJ Capital Renewal

Amtrak performed undercutting and installed 13,000 new concrete ties and continuous welded rail near Linden, NJ.

MD Capital Renewal

Amtrak performed undercutting and installed 16,000 new concrete ties and continuous welded rail, replacing aging infrastructure at 3 locations in Northeastern Maryland.

Power and Express Cable Upgrade Project

MBTA replaced approximately 21,000 feet of power, express, and communication cable between Read Interlocking and Forest Interlocking. This asset has been returned to a state of good repair and will improve the reliability of the signal and communication systems.

CT Capital Renewal

Amtrak replaced 16,000 wood ties and timbers on the Springfield Line near Windsor, CT.

Ruggles Street Station Accessibility Improvements: Phase 1

MBTA constructed a new commuter rail platform at Ruggles Street Station in Boston, expanding capacity of the existing station. The project also constructed or replaced five elevators and made the station more accessible to riders through pedestrian enhancements.



Next Generation Acela Infrastructure Upgrades: Southampton Yard

Amtrak upgraded the service and inspection facilities at Southampton Yard in Boston to support the new Acela trainsets. The improved facilities have greater capacity and will support commissioning, inspection, service, and maintenance of Amtrak's new high speed rail fleet.

Shore Line East Station Improvements (Clinton)

Connecticut DOT constructed a new platform at Clinton Station which previously had been operationally restrained with a single side platform. By improving the platforms, CTrail Shore Line East service more than doubled at the station.



NE Capital Renewal

72,000 feet of aging rail infrastructure was replaced on the NEC Main Line along 7 track segments in Connecticut and Rhode Island by Amtrak.

Measuring Plan Adherence Beyond Expenditures

The Commission has been using annual expenditures to analyze plan adherence since the FY19 Annual Report because it is the most common, readily available metric provided by submitting agencies across the NEC. Annual expenditures alone, however, are not a holistic way to evaluate plan adherence, progress on project delivery, or the efficiency of capital investment. Additional metrics on scope, schedule, and budget are needed to adequately measure capital delivery performance.

To address these concerns, the Commission began to collect data on planned units for select production programs (e.g., tie replacement) and anticipated milestones for projects in Year One of the FY21-25 CIP. The plan data was collected with the expectation to move beyond an expenditure-based analysis in the FY21 Annual Report. However, the FY21 report was unable to include this type of analysis due to persistent challenges in both plan and report data submissions. The Commission refined requests for unit and milestone data for the FY22 plan and report in the hope of future progress.

FY22 Units Delivered for Production Programs

Commission staff received unit data on 21 production programs—nine from Amtrak and 12 from MBTA—for the FY22 plan and report. MTA Metro-North and Connecticut DOT have not to date provided planned or actual unit data requested by the Commission but will work to make this data available in the future.

The data provided (complete details available in the *Project Information Appendix*) show a range of outcomes. Some units exceeded plan with costs lower than expected. Some units fell short of plan while costs ran high. In other cases, units and costs fell short or exceeded plan in roughly the same proportion. This type of information provides much more insight into performance than expenditure data alone.

For Amtrak, this current process requires the manual verification of data from a centralized database. The current approach presents concerns regarding the level of effort required and the accuracy and completeness of the data. Long term, a centralized database that can be relied upon as an agency-wide authoritative source of data would make this effort more consistent, reliable, repeatable, and efficient. Building such systems would improve Amtrak's ability to track completed work, update asset data, and facilitate reporting. The lack of these systems today also hampers the ability of the Commission and the Federal Railroad Administration to track progress on the programmatic state-of-good-repair backlog (see page 26 for more).

FY22 Milestones Achieved for Projects

Submitting agencies only provided planned milestones for 75 of 119 (or 63%) of active projects in FY22. The Commission did not structure the milestone data request, so planned milestones varied widely in level of detail, from “Complete catenary pole installation” for Hanson Interlocking to “Initiate Construction” for Penn Station Access. Agencies also submitted as many milestones per project as they deemed appropriate. Of the 207 planned milestones, 80 (or 38.6%) milestones were completed in FY22 with 127 (or 61.3%) milestones deferred to FY23 or later. While this effort yielded some insight, the variation in milestone definition prevents meaningful summary of end-of-year milestones achieved or deferred across all projects on the NEC.

Internal data system issues are, again, a major obstacle. The planned milestones were created ad hoc for each project, requiring additional agency staff time and effort to generate and report on. Amtrak notified the Commission it will submit milestones for the quarterly reporting process that align with the milestones provided to the FRA in its Project Status Reports (PSRs) which, in some cases, differ from what was provided to the Commission for the FY23 CIP. The Commission will work with Amtrak and other project sponsors to reform capital project delivery performance measurement within the limitations of existing data systems in FY23. Moving forward, higher quality data and some level of milestone standardization will be necessary in both the annual capital plan and subsequent reporting for meaningful analyses and to successfully deliver capital projects.

Actions Needed to Remedy Shortcomings

With additional IIJA funds becoming available in FY23, measuring plan adherence is more important than ever. However, the issues above mean that in the near term expenditures will remain the primary method of measuring plan adherence.

The Commission will work with all RoW owners and project sponsors to develop more comprehensive metrics to measure plan adherence to provide a richer picture of capital program delivery progress and efficiency. Plan adherence metrics in future years may include reporting on life-of-project scope, cost, and schedule progress (rather than annual expenditure), track outage commitments, and productivity of capital renewal programs.

This effort will require some Commission member agencies to reform internal systems to provide reliable cost, schedule, track outage, and production unit data without burdensome manual data gathering processes. The Commission will report on progress in the FY24 plan (anticipated publication in October 2023) and in the FY24 Annual Report (anticipated publication in March 2025).

Delivering Year One of the FY22-26 NEC Capital Investment Plan

Year One of the CIP serves as the baseline for infrastructure delivery analyses in the NEC Annual Report. These analyses attempt to understand accomplishments relative to plan and adjustments to plan which can occur, particularly during a time of increasing inflation and workforce and supply chain challenges.

Data for the FY22-26 CIP was gathered during summer 2021, with the Commission reviewing and approving the plan in October 2021—one month before IIJA was signed into law. Staffs at Commission member agencies, to the best of their abilities, forecasted projects and programs to advance in FY22 and their respective planned expenditures and milestones.

Measuring plan adherence remains important to the Commission's key pillars of transparency, collaboration, and accountability and supports Commission members as they build their ability to deliver the CONNECT NEC Program bolstered by historic funding from IIJA.

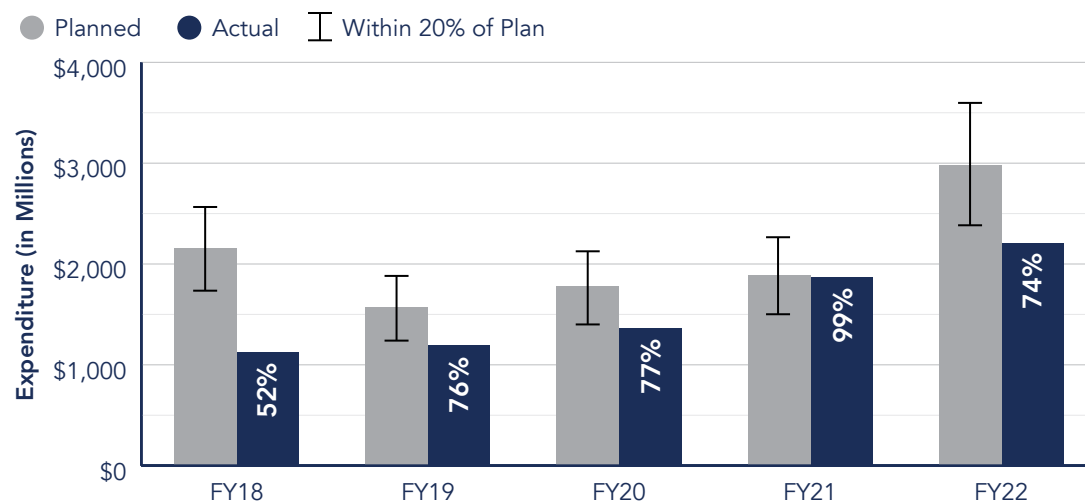
In lieu of readily available metrics for holistic capital program delivery performance (see pages 16-17), the Commission continues to define plan adherence as end-of-year expenditures that fall within 20% of the planned expenditure approved in Year One (FY22) of the CIP.

Overall adherence to planned expenditure worsened in FY22, but similar to FY19 and FY20

NEC project sponsors planned to spend almost \$3.0 billion in FY22, but fell short and invested \$2.2 billion—above FY21 total spending, but only 74% of FY22 planned expenditures (see Figure 2-5).

However, FY21 was a relative outlier where project sponsors spent 99% of planned expenditures largely due to two projects in the New York City Metro region with unexpected expenditures totaling over \$500 million that were not anticipated in the FY21 plan. In the two proceeding years, project sponsors spent 77% of planned expenditures (FY20) and 76% (FY19).

Figure 2-5. FY18-22 total planned and actual expenditures (millions) and adherence to plan (percent)



Plan adherence analyses

By region. Project sponsors in the New York City Metro and Mid-Atlantic North regions spent 83% and 98% of FY22 planned expenditures, respectively (see Figure 2-2). The New York City Metro region includes four projects with FY22 actual expenditures over \$100 million. Three of those four projects (New York Penn Station LIRR Concourse, Harold Interlocking, and Portal North Bridge) were within 20% of the planned expenditure, with the fourth project (Penn Station Access) just missing that goal at 78.3% of FY22 planned expenditure.

The Connecticut-Westchester (NHL) region experienced low plan adherence because the Walk Bridge Program experienced a delay due to the environmental permitting process, contributing to a significant underspend in FY22. While construction did not advance as originally planned, several enabling activities were able to continue.

Amtrak System-wide programs had poor plan adherence, with low expenditures attributed to supply chain issues delaying the procurement of new equipment and parts for equipment renewals.

By submitting agency. All NEC project sponsors experienced difficulty spending within 20% of their respective FY22 planned expenditures (see Figure 2-6). Amtrak, MTA, and NJ TRANSIT were close, but did not meet the Commission's plan adherence metric. Most agencies, except for NJ TRANSIT and Pennsylvania DOT, underspent to plan.

Figure 2-6. FY22 adherence by submitting agency (millions)

Submitting Agency	Total Investments in FY22	FY22 Planned Expenditure	FY22 Actual Expenditure	Percent of Plan Spent
Amtrak	191	\$1,293.0	\$995.6	77%
MBTA	33	\$54.4	\$30.7	56%
Rhode Island DOT	3	\$28.1	\$13.0	46%
Connecticut DOT	35	\$424.7	\$202.9	48%
MTA	17	\$885.3	\$685.5	77%
NJ TRANSIT	14	\$153.4	\$195.5	127%
SEPTA	8	\$30.8	\$9.0	29%
Pennsylvania DOT	6	\$15.8	\$23.4	148%
Delaware DOT	2	\$54.0	\$25.6	47%
Maryland DOT MTA / MARC	3	\$44.1	\$28.3	64%
VRE	1	\$0.5	<\$0.1	3%
Total	313	\$2,984.1	\$2,209.4	74%

By investment type. NEC project sponsors were within planned expenditures for station investments (see Figure 2-7). Investments at five stations, in particular, adhered to plan: South Attleboro Station (MA); New York Penn Station LIRR Concourse (NY); Ardmore Transportation Center (PA); Claymont Transportation Center (DE); and New Carrollton Station (MD).

Some capital renewal investments fared well from an expenditure perspective. Amtrak's infrastructure renewal work at New York Penn Station, upgrades to constant tension catenary from Clark to Ham, the turnout renewal program, the concrete tie replacement program, and many more projects and/or programs achieved good plan adherence.

Plan adherence for major backlog projects varied. Expenditures at Portal North Bridge (NJ), East River Tunnel (NY), Pelham Bay Bridge (NY), Susquehanna River Bridge (MD), and the B&P Tunnel (MD) all adhered to plan. As noted earlier, the Walk Bridge Program in Connecticut faced permitting delays, which affected Connecticut DOT's ability to advance construction work as originally planned.

Figure 2-7. FY22 adherence by investment type (millions)

Investment Type	Total Investments in FY22	FY22 Planned Expenditure	FY22 Actual Expenditure	Percent of Plan Spent
Major Backlog	12	\$480.8	\$303.8	63%
Capital Renewal	207	\$1,104.0	\$837.0	76%
Improvement	41	\$812.7	\$594.8	73%
Stations	52	\$583.7	\$472.4	81%
Planning Studies	1	\$3.0	\$1.4	47%
Total	313	\$2,984.1	\$2,209.4	74%

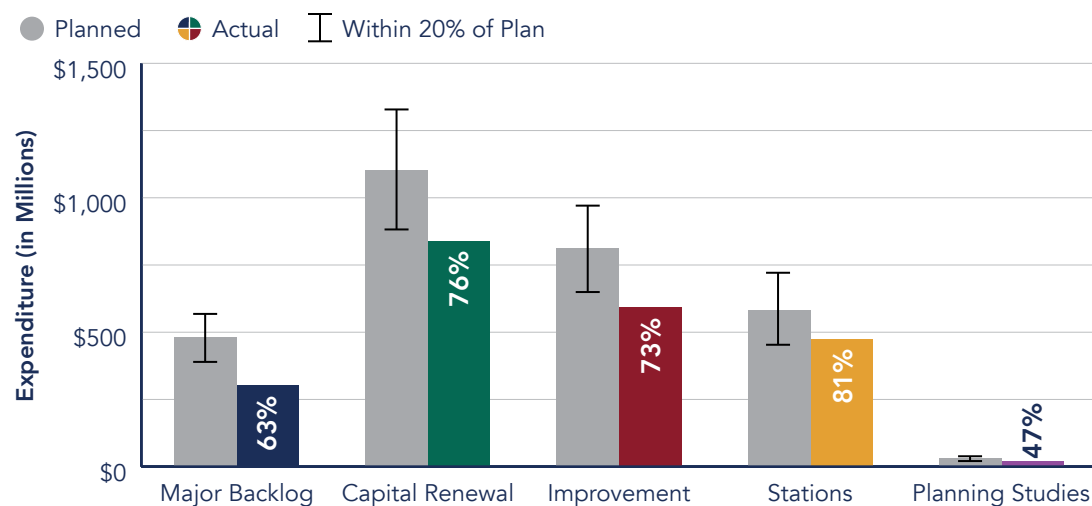


Figure 2-8. Top ten projects that did not adhere to plan by variance (dollar value)

Project Name	FY22 Planned Expenditure	FY22 Actual Expenditure	Variance	Explanation of Variance (as Submitted)
Walk Bridge: Replacement (Connecticut DOT)	\$222.0 M	\$30.3 M	-\$191.7 M	Project did not begin construction due to delayed environmental permitting process. Several enabling activities were able to continue under a separate project.
Engineering Major Equipment Acquisition Program (Amtrak)	\$155.1 M	\$52.2 M	-\$102.9 M	Supply chain-related delays have pushed back equipment delivery dates.
Penn Station Access (MTA)	\$400.0 M	\$313.1 M	-\$86.9 M	The project experienced delays in both design support and construction activities due to a lack of Amtrak Force Account and Track Outages in Q3/Q4.
Next Generation Acela Infrastructure Upgrades: Sunnyside Yard (Amtrak)	\$69.9 M	\$17.8 M	-\$52.0 M	Force account availability issues in this region have delayed the delivery of the work.
Philadelphia 30th Street District Plan (Amtrak)	\$23.5 M	\$62.0 M	+\$38.5 M	The variance results from a change in the project's accounting since the FY22 planned expenditure was calculated. The project's actuals are now based on percentage of work completed. Future planning and reporting will reflect this methodology.
Harold Interlocking (MTA)	\$164.0 M	\$130.5 M	-\$33.5 M	Amtrak resources continue to be lower than planned levels needed to maintain schedules, resulting in delays.
Newark (DE) Regional Transportation Center (Delaware DOT)	\$32.0 M	\$0.7 M	-\$31.3 M	Project remains stalled while the parties explore cost effective means of completing the project in a manner that meets its intended use.
River-to-River Rail (R4) Resiliency: West Side Yard and Queens Portal (MTA)	\$25.0 M	\$0.6 M	-\$24.4 M	Project experienced procurement delays due to pending Amtrak-LIRR agreement and scheduling for related Hudson Tunnel Project components and delayed Amtrak design review.
New Haven Line Yard and Facility Program (Connecticut DOT)	\$10.0 M	\$30.0 M	+\$20.0 M	Work had to be coordinated within Metro-North track and power outage scheduling constraints.
New Haven Line Station Platform Replacement Program (Darien) (Connecticut DOT)	\$20.0 M	\$1.0 M	-\$19.0 M	Project experienced delays related to procurement and utility coordination which impacted the schedule of planned activity for FY22.

Note: See *Project Information Appendix* for more project detail.

Broader trends likely contributing to poor plan adherence

Project sponsors submit explanations for any variance between planned and actual expenditure (see the *Project Information Appendix* for details). Common reasons for differences between actual expenditures and planned expenditures include project delays, scope changes, and cost changes. Workforce and material availability are frequently referenced in project submissions. While material availability creates project risk during the procurement and construction phases, workforce availability concerns can affect projects throughout the entire life of the project.

Progress in Assessing and Eliminating the State-of-Good-Repair Backlog

A state of good repair (SOGR) means assets are within their useful life or are in a condition to perform as designed. The SOGR backlog refers to the population of assets—both large bridges and tunnels (major backlog) and the programmatic capital renewal of basic infrastructure assets—on the NEC that are no longer in this condition. An asset’s useful life can vary from a few years to many decades, after which it should be replaced. Some assets can operate safely beyond their useful life, though they can become more expensive to maintain and more vulnerable to failures that cause service disruptions.

The NEC Cost Allocation Policy requires that the Commission report on the progress in eliminating the NEC SOGR backlog in the Annual Report. The FY20 Annual Report (published in March 2021) reported that the Commission would first work with Amtrak as the largest RoW infrastructure owner to determine the appropriate method to establish the current backlog as a baseline to measure progress. The Commission noted in the FY21 Annual Report that progress on setting the baseline remained stalled due to challenges with Amtrak data systems.

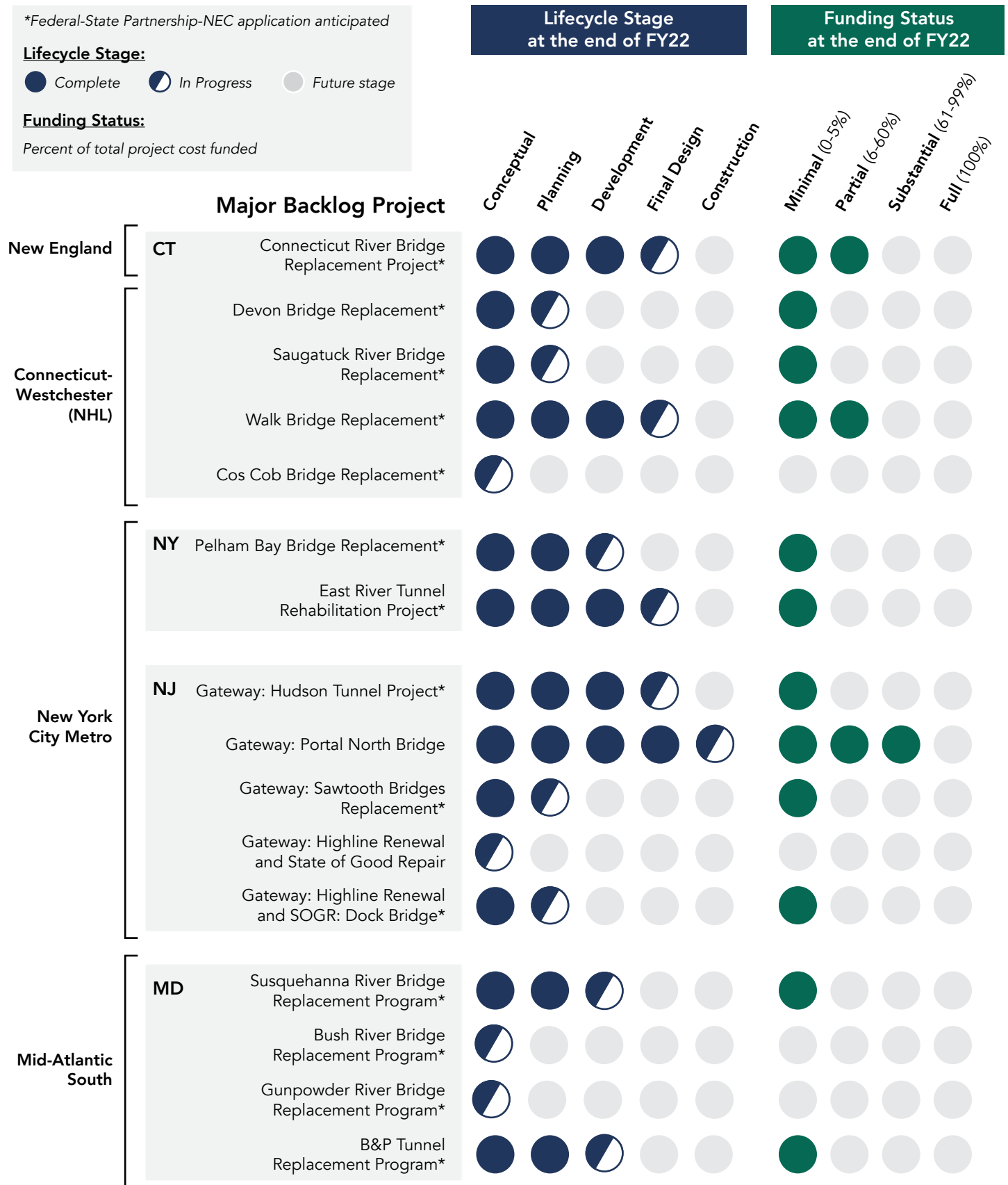
With historic funding available from IIJA to reduce the backlog more aggressively, this effort is more important than ever. The below update sets a baseline for major backlog assets. However, the programmatic backlog baseline remains stalled. RoW owners must make reforms to internal data systems to report on progress in eliminating that backlog.

Major Backlog

These large bridge and tunnel replacement or rehabilitation projects will eliminate a significant portion of the SOGR backlog for many generations. Figure 2-9 on the next page notes the current lifecycle stage and funding status of major backlog projects as of the end of FY22 (i.e., September 2022) and serves as the baseline for measuring future progress. The combination of current life cycle stage and funding status will provide a holistic status evaluation over time as implementation of these large projects may last a decade or longer. Although funding is expected to start flowing to these projects in the near future, it will take much longer to see progress in lifecycle stage.

One issue with this approach is a potential backward shift in funding status due to escalating costs. Additionally, although the current list of major backlog projects is included in the Cost Allocation Policy, there are other large, century old bridges that may be appropriate to categorize as major backlog in the future.

Figure 2-9. Status of major backlog projects at the end of FY22



Programmatic Backlog

The Commission continued to work with Amtrak, the largest RoW infrastructure owner on the NEC, on an approach to assessing the SOGR programmatic backlog. Systems issues persist at Amtrak which hampers the ability for the Commission to identify benchmarks and track progress (see *Measuring Plan Adherence Beyond Expenditures* on page 16 for more).

The Commission has identified a proposed approach for setting a baseline of a percent of a certain subset of assets in a SOGR at the beginning of the federal fiscal year, and then reporting the percent in a SOGR at the end of the year. This assessment would be based both on additional assets that aged out of SOGR and new assets that replaced backlog assets during that federal fiscal year.

While it would be preferable to use condition data to measure the backlog, the Commission proposes to continue to use age versus useful life as an SOGR proxy until condition data is gathered more robustly. Figure 2-10 on the next page lays out the proposed method of measuring the programmatic backlog.

Many of the same systems issues that plague production unit reporting are behind this inability to set a SOGR baseline and track progress. RoW owners must reform internal asset tracking systems to be able to generate this information reliably and efficiently. The Commission will work with RoW owners to fill out “Asset Count,” “Percent of Assets in SOGR (start of FY24),” and “Planned assets to be replaced” for the FY24 plan. RoW owners should then provide the Commission data to complete the table for the FY24 Annual Report. If these milestones are not met, the Commission will report on progress in those documents.

Figure 2-10. Table of asset types that will be used in the FY24 Plan and FY24 Annual Report to measure progress in eliminating the programmatic backlog

Asset type (Activity)	Unit	RoW owners to provide asset counts, age, useful life, and planned units for replacement for all assets for inclusion of the FY24 Plan (anticipated publication in Oct 2023)			RoW owners to provide list of all assets replaced in FY24 data for inclusion of the FY24 Annual Report (anticipated publication in Mar 2025)		
		Asset count	Percent in SOGR (start of FY24)	Planned assets to be replaced in FY24	Actual assets replaced in FY24	Assets that fell out of SOGR in FY24	Percent in SOGR (start of FY25)
Ballast (Surfacing)	Track miles	#	%	#	#	#	%
Ballast (Undercutting)	Track miles	#	%	#	#	#	%
Catenary Pole (Replacement)	Each	#	%	#	#	#	%
Catenary Wire (Replacement)	Miles of catenary	#	%	#	#	#	%
Central Instrument House (Replacement)	Each (per track)	#	%	#	#	#	%
Concrete Ties (Replacement)	Track miles	#	%	#	#	#	%
Culvert (Replacement)	Each	#	%	#	#	#	%
Rail (Grinding)	Rail miles	#	%	#	#	#	%
Rail (Replacement)	Rail miles	#	%	#	#	#	%
Signals (Replacement)	Each	#	%	#	#	#	%
Substations (Replacement)	Each	#	%	#	#	#	%
Switch Machine (Replacement)	Each	#	%	#	#	#	%
Turnouts (Replacement)	Each	#	%	#	#	#	%
Undergrade Bridges (Replacement)	Each	#	%	#	#	#	%
Wood Ties (Replacement)	Track miles	#	%	#	#	#	%

Note: The asset types listed above represent a subset of the asset data the Commission collects.



Left: Hanson Interlocking near New Carrollton, MD. **Middle:** Crews installed new catenary foundations in 2019. **Right:** A new central instrument house is raised off the ground to protect the interior electronic equipment from potential flooding.

Spotlight on Hanson Interlocking

Reliable interlockings are critical for operational safety and service flexibility

An interlocking is a collection of signals and switches at a location that controls the movement of trains between tracks. Whether they are as simple as a single crossover or have a complicated layout with many connecting tracks, interlockings are some of the most complex components of railroad infrastructure.

In an interlocking, switches, also referred to as turnouts or crossovers, connect parallel tracks. Signal appliances and control machinery facilitate the movement of trains at switches and ensure that operations are safe. Signal systems may include home signal bridges at the entrance and exit points that define the limits of an interlocking. In addition to signals and switches, the functionality of an interlocking relies on many different interconnecting components of the railroad, including wiring, communication appliances, catenary structures and other utilities.

Interlockings are designed so that conflicting or unsafe operations cannot occur, such as routing opposing trains on the same track. Signal systems at an interlocking must indicate a clear and safe route for a train to proceed through the interlocking. Importantly, the tracks are then locked in place to prevent any conflicting routing until the train has passed through the affected portion of the interlocking. Outdated interlockings can cause challenges to operational safety and impact service reliability as trains must travel at slower speeds through the interlocking.

Complex construction to build new Hanson Interlocking will ensure efficient and safe train operation

Amtrak staff began a study in 2003 on how to modify the existing Landover Interlocking, located in Maryland near the District of Columbia, to accommodate higher speeds and future expansions of Amtrak and Maryland DOT MTA / MARC

operations. However, it was determined that a new interlocking would be the only way to achieve these goals. The construction of the new Hanson Interlocking will allow for the retirement of aging Landover Interlocking.

The new interlocking is needed to allow express and local trains to operate simultaneously. The new configuration will reduce conflict and increase service flexibility at New Carrollton Station once complete. The project scope includes four new crossovers, a 4,600-foot access road, a central instrument house and other signal infrastructure, power distribution equipment, a ductbank/cable trough, two new signal bridges, and 44 new catenary foundations and associated structures and wiring. The project also includes the demolition and removal of Landover Tower, three existing crossovers, a signal bridge, and other modifications to existing signals and switches.

The project has faced a variety of challenges due to the complex nature of interlockings. Project management can be difficult when there are many different interconnected components of the railroad. The entire interlocking cannot be replaced or updated simultaneously, which can cause delays in the project timeline. Unforeseen circumstances and supply chain issues can also cause delays if supplies are backordered. Additionally, with such a complex project, interagency coordination between Amtrak, MTA, and other organizations is necessary to the success of the project. Despite these challenges, Hanson Interlocking is scheduled for completion in August 2024.

Hanson Interlocking Timeline



Learn more about the NEC from these past Annual Report case studies:

- How **weather** can affect train operations and performance, FY19 Annual Report, page 15
- How operational performance of the railroad is closely linked to the **infrastructure condition** and investment, FY19 Annual Report, pages 18-20
- Spotlight on the **B&P Tunnel**, FY20 Annual Report, pages 22-23
- Spotlight on **switch machines**, FY20 Annual Report, pages 39-40
- Spotlight on **pre-construction**, FY21 Annual Report, pages 25-27
- Spotlight on **resiliency**, FY21 Annual Report, pages 37-39

3. Operations

This section summarizes NEC operations during federal fiscal year 2022 using available data for service and ridership, train performance, and major service incidents. Analyzing NEC operators, including trends over time, helps track how well the corridor serves its customers and also helps agencies identify ways to improve service.

Service and Ridership

Service and ridership levels continue to rebound, ending FY22 with the highest observed levels since the coronavirus pandemic began.

The Northeast Corridor has been and remains the busiest rail corridor in the United States. The NEC was expected to break ridership and service records in FY20 before the pandemic outbreak. There were 930,000 average weekday trips and 2,200 average weekday trains on the corridor in February 2020—just before the onset of the coronavirus pandemic that brought on historic lows for both intercity and commuter rail services.

Ridership plummeted in March 2020, followed by oscillating ridership trends due to the emergence of new coronavirus variants. After some recovery, ridership saw another decline in October 2021, dropping to 343,000 weekday trips in January 2022 with the peak of omicron infections. Ridership then rebounded, ending FY22 with over 593,000 weekday trips (62% of pre-pandemic trips)—the highest since March 2020 (see Figure 3-1). By the end of FY22, trips on the NEC grew by 37% from the prior fiscal year. All NEC operators experienced a growth in riders. On average, weekday trips on the NYC-area commuter rail systems (Metro-North, LIRR, and NJ TRANSIT) accounted for over 77% of all NEC weekday trips in FY22. The largest percentage growth over FY21 were trips on VRE and MBTA services with 147% and 72% year-over-year growth, respectively.

NEC operators have continued to incrementally increase service closer to pre-pandemic levels. NEC service featured 1,997 daily intercity and commuter trains by the end of FY22, roughly 93% of pre-pandemic service. NEC service grew by over 8% from the prior fiscal year. Average weekday train service from MBTA, CTrail, MARC, and VRE remained reasonably constant in FY22, while Amtrak, Metro-North, LIRR, NJ TRANSIT, and SEPTA were operating additional weekday trains by the end of the fiscal year (see Figure 3-2).

Figure 3-1. FY20-22 average NEC weekday trains and trips by month

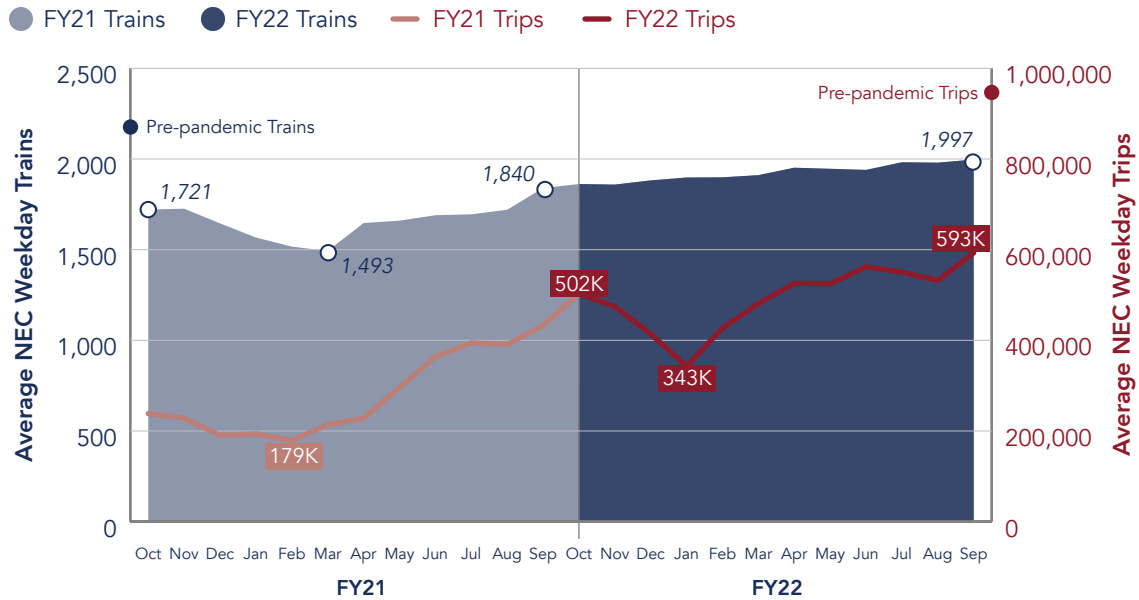


Figure 3-2. FY22 average NEC weekday trains and trips by operator

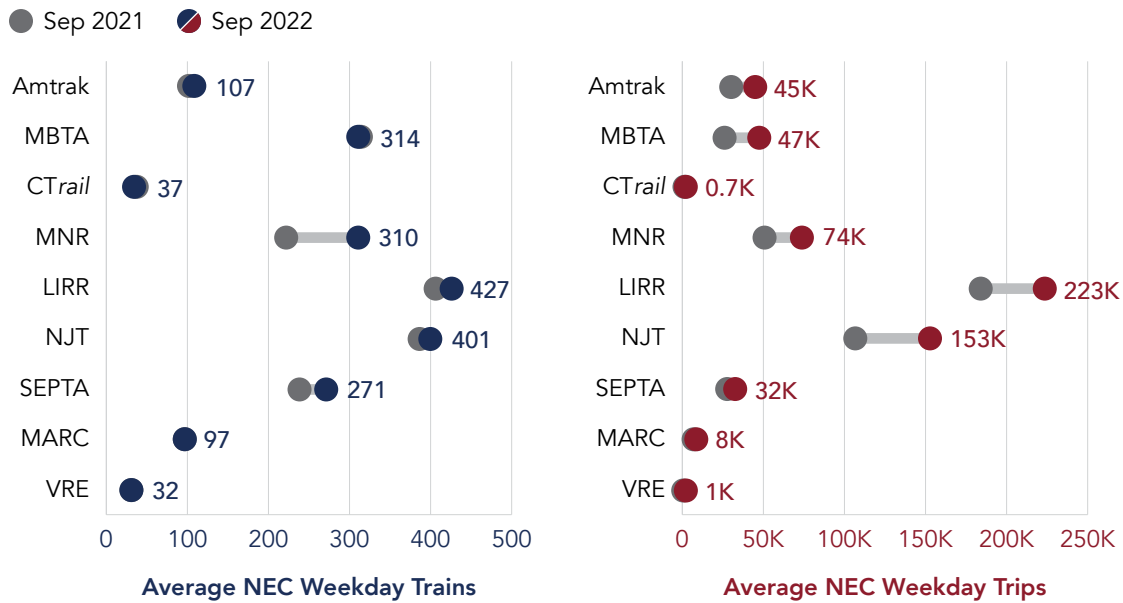


Figure 3-3. Top ten U.S. commuter rail systems by number of system-wide trips

Primary State	Operator	Sep 2022 System-wide Trips (Millions)	Percent of all Commuter Rail Trips	Sep 2019 System-wide Trips (Millions)	Percent of all Commuter Rail Trips
NY	LIRR	6.4	26%	9.8	23%
NY	Metro-North	4.8	19%	7.5	18%
NJ	NJ TRANSIT	4.5	18%	7.7	18%
IL	Metra	2.4	10%	5.2	12%
MA	MBTA	1.8	7%	2.6	6%
PA	SEPTA	1.5	6%	3.1	7%
CO	RTD	0.7	3%	0.9	2%
CA	Caltrain	0.6	2%	1.5	3%
CA	Metrolink	0.4	2%	1.1	2%
UT	FrontRunner	0.3	1%	0.5	1%

Note: Data from the Federal Transit Administration's National Transit Database. Trips are inclusive of all services offered by the operator.

While commuter rail has been slower to recover than other transportation modes such as buses and light rail,¹ data from the National Transit Database shows that NEC operators carried 78% of the nation's commuter rail trips at the end of FY22, compared to 75% in FY19. Many NEC operators have noted a shift in ridership patterns. Daily ridership data from MTA on its Metro-North and LIRR commuter rail systems found that ridership recovery has been significantly greater on weekends, while recovery on weekdays has lagged. Metro-North trips on Saturdays and Sundays average 99% and 90% of pre-pandemic levels, respectively, while weekday ridership recovery rates range from 57-70%. MTA observed higher ridership on both systems in the middle of the week, with the highest weekday ridership typically on Tuesdays.²

NEC Operating Surplus

Federal statute and the NEC Cost Allocation Policy requires Amtrak to provide an accounting of how its NEC operating surplus, if any, was expended.

There was a \$231,000 operating surplus on Amtrak's NEC service line—a hopeful sign of rebounding ridership and ticket sales after more than two years of the pandemic. Amtrak staff will report to the NEC Commission for future Annual Reports on how its revenues are reinvested back into the NEC.

1 American Public Transportation Association, "APTA Public Transportation Ridership Update," published September 2022, www.apta.com/wp-content/uploads/APTA-POLICY-BRIEF-Transit-Ridership-09.28.2022.pdf.

2 MTA, "Day-by-day ridership numbers," published January 30, 2023, <https://new.mta.info/coronavirus/ridership>.

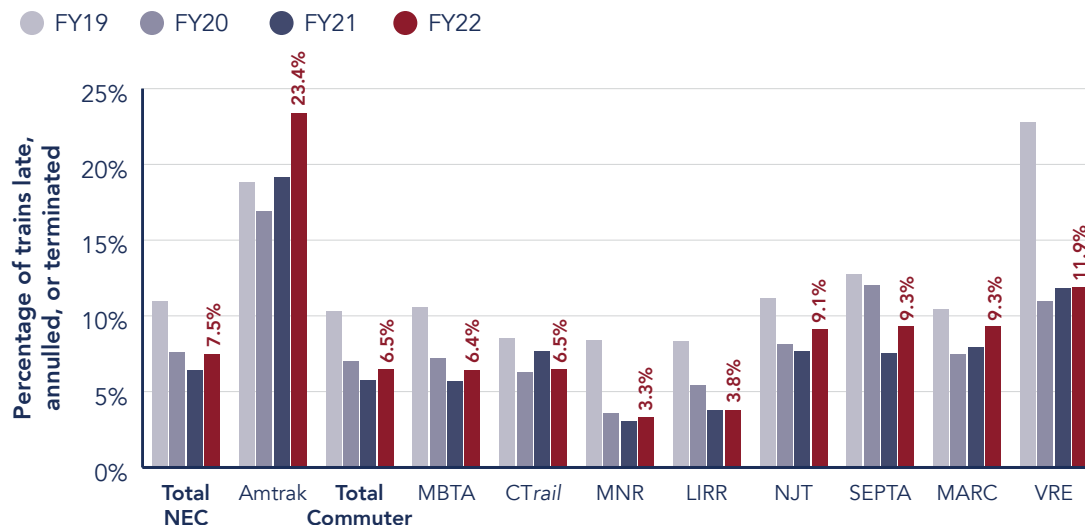
Train Performance

Increase in service brings back challenges to maintaining the relatively high levels of reliability experienced during the pandemic

NEC train service has generally been more reliable since the start of the pandemic, largely due to lower service levels that create fewer opportunities for delays to occur. Roughly 7.5% of NEC trains arrived late, annulled, or were terminated in FY22, an increase from 6.4% of trains in FY21 (see Figure 3-4). This increase is consistent with the fact that additional NEC trains returned to service in FY22 (an 8.5% increase over the same time period). Overall NEC train service remains more reliable than pre-pandemic services with 11.0% trains late, annulled, or terminated in FY19.

Metro-North, LIRR, and VRE were on par with percent trains late, annulled, or terminated compared to prior years. *CTrail* experienced improved reliability, which is likely attributed to a reduction in train service during the fourth quarter of FY22 to accommodate construction at Hartford Union Station. Amtrak, NJ TRANSIT, SEPTA, and MARC services, on the other hand, experienced various levels of increased delays related to infrastructure, mechanical, transportation, and third-party issues, compared to years prior, which was likely due to the re-introduction of services. MARC in particular increased service by 74% compared to FY21. And Amtrak's percent of trains late, annulled, or terminated returned to levels seen in FY15-18.

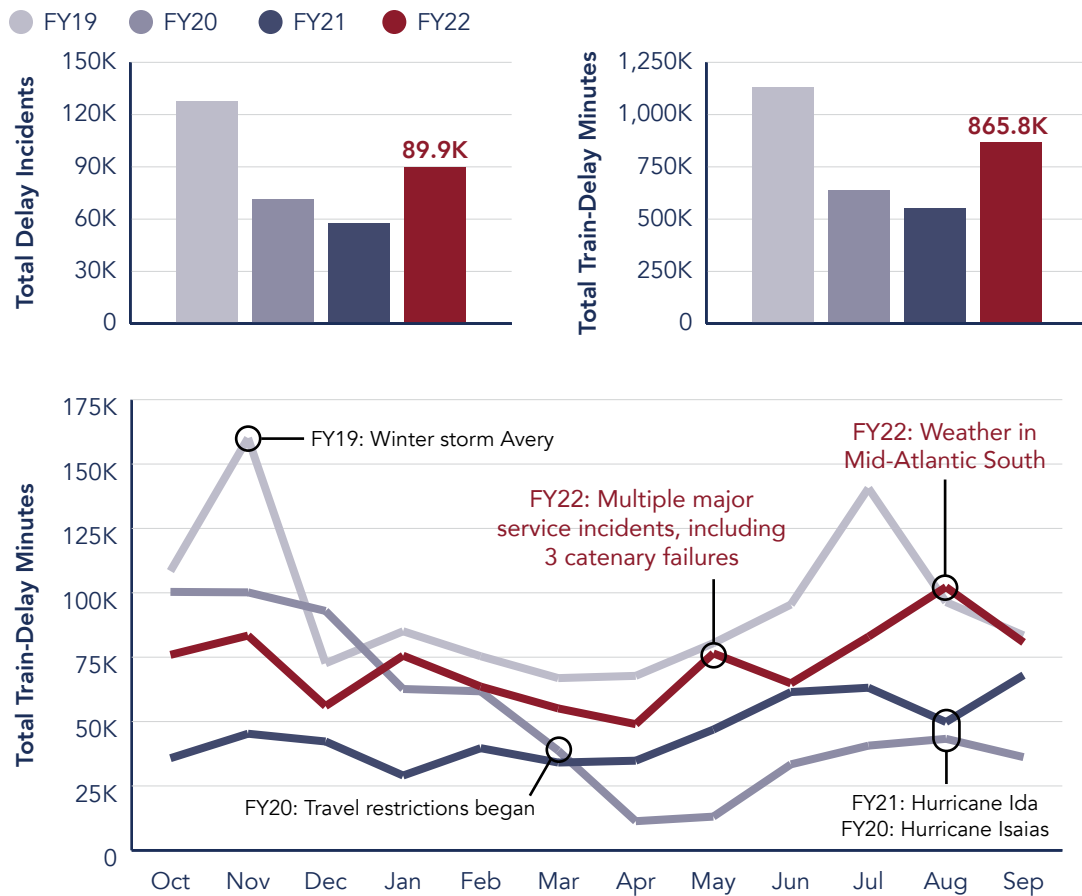
Figure 3-4. FY19-22 percent trains late, annulled, or terminated by operator



Train delays—by both the total number of incidents and by minutes—increased in FY22 with nearly 90,000 delay incidents and over 865,000 train-delay minutes, a 56.5% and 57.4% increase from FY21, respectively (see Figure 3-5). However, even after these increases, train delays remain well below FY19 levels.

Delays in FY22 were generally consistent throughout the year, with peaks in the last quarter accounting for nearly a third of the year’s total train-delay minutes. FY22 weather events did occur but were less extreme than recent years. Several major service incidents in May and August 2022 were extremely disruptive and account for the peaks in total train-delay minutes. See page 36 for more on major service incidents.

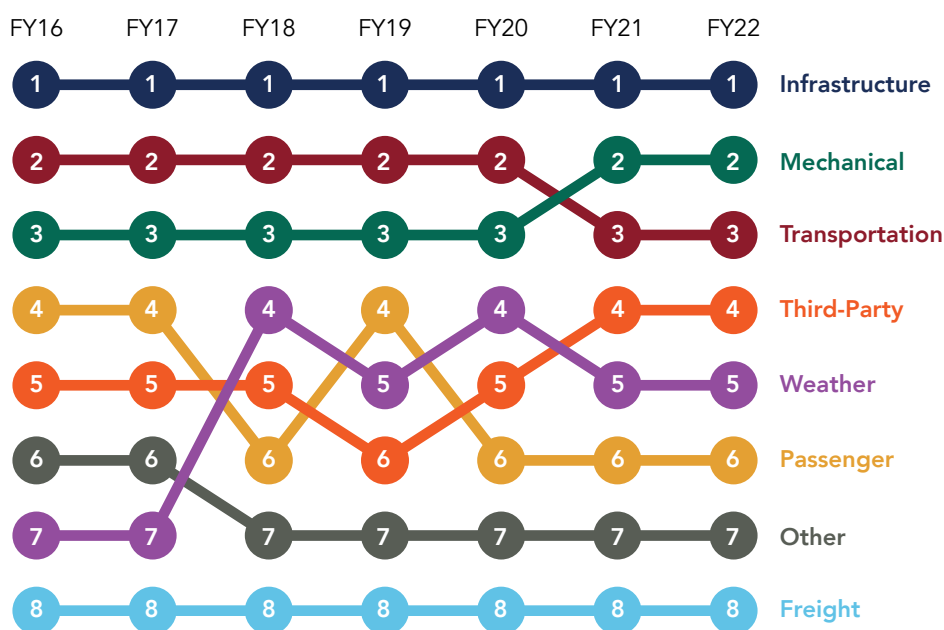
Figure 3-5. FY19-22 total train delays



Infrastructure remains as top cause of delays

Infrastructure, mechanical, and transportation remain the top three categories of delay (see Figure 3-6). The stability of the top three categories underscores that while train performance can improve with reduced service, capital investments that ensure reliable service for riders remain critically important, especially as service levels are restored and/or increased.

Figure 3-6. FY16-22 annual ranking of train-delay minutes by cause

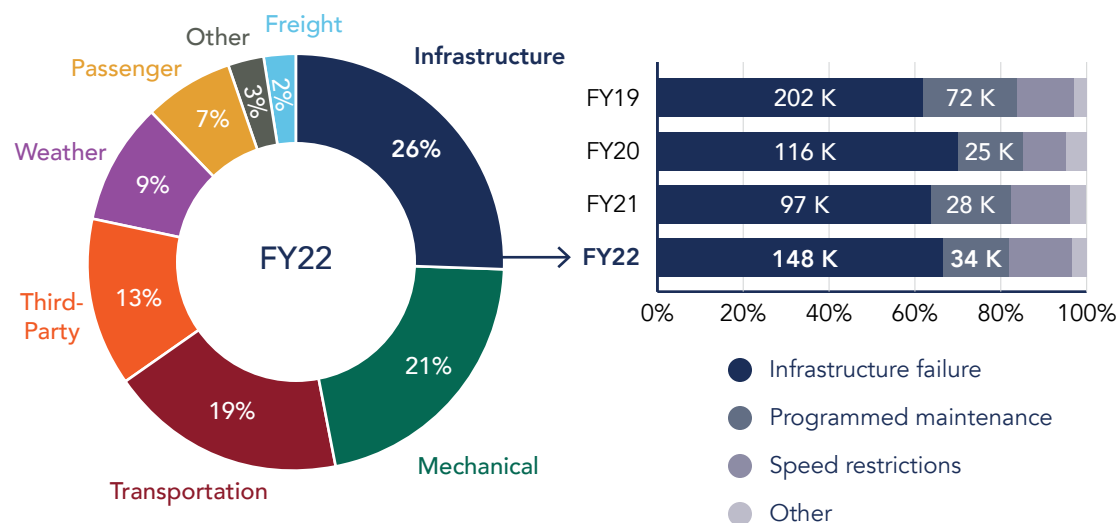


NEC Commission Cause of Delay Categories

Individual railroads maintain their own classification of delay causes. The Commission gathers, consolidates, and analyzes causes of delay from all NEC railroads to create a consistent framework that allows for a corridor-wide analysis. Under this approach, the Commission utilizes eight cause-of-delay categories defined below:

- **Infrastructure:** Failure of track, communications and signals, electric traction, and structure assets; programmed maintenance including any late clearings; and speed restrictions.
- **Mechanical:** Locomotive failure; coach failure; and disabled train ahead.
- **Transportation:** Train dispatching and routing; train interference; and crew availability.
- **Third-Party:** Trespassers; police action; bridge openings; debris on tracks; and utility failure.
- **Weather:** Precipitation; wind; excessive cold or heat; slippery rail; and weather-related infrastructure failures.
- **Passenger:** Passenger loading time; passenger behavior or injury; and holding for connections.
- **Other:** No report provided; delay cause unknown; and derailment.
- **Freight:** Freight train interference.

Figure 3-7. FY22 train-delay minutes by cause



Infrastructure delays accounted for 26% of all train-delay minutes in FY22, including delays from failures of specific assets, programmed maintenance, and speed restrictions. Of this category, the majority of delays resulted from infrastructure failures, primarily with communications and signals, track, and electric traction assets. Mechanical (21%) and transportation (19%) were the second and third largest categories of delay in FY22 (see Figure 3-7).

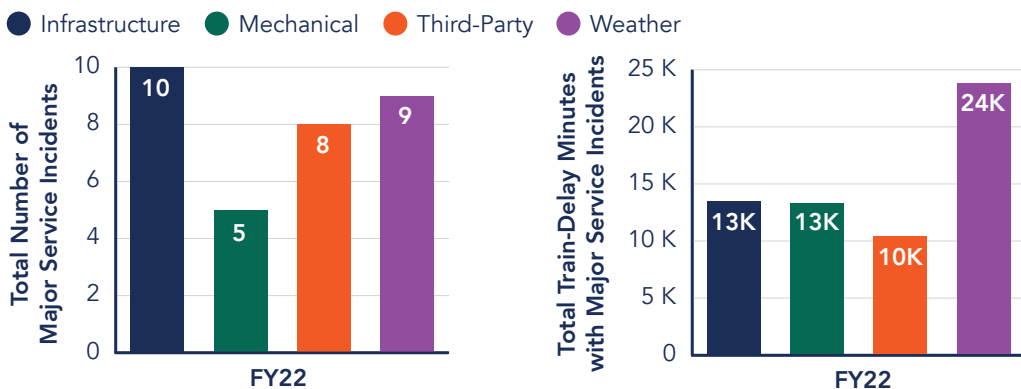
Some mechanical delays are primarily attributed to mechanical issues, but others may include some secondary infrastructure-related causes. For example, there were several major incidents in FY22 where trains reported intermittent power loss. These incidents were primarily attributed to a mechanical failure of a train's pantograph but required crews to inspect the right-of-way and repair any potential issues with the overhead catenary.

The return of service also brings more major service incidents

Major service incidents are single events that generate multiple train delays. These incidents typically shut down operations over a stretch of the NEC and require an extended period of time to resolve. Major service incidents are identified by analyzing train performance data and cross-referencing the data with daily operations reports from NEC operators.

Major service incidents dramatically increased in FY22 largely due to the return of more trains into service. There were 32 major service incidents and nearly 61,000 train-delay minutes in FY22 (see Figure 3-8). There were only 12 incidents totaling almost 28,000 train-delay minutes in FY21. A full list of major incidents is available in the *Project Information Appendix*.

Figure 3-8. FY22 major service incidents



Nearly a third of FY22’s major service incidents were infrastructure-related, most of which were due to catenary failures. There were three very disruptive catenary failures in May and June 2022 in the New York City Metro region that involved the loss of power and broken pantographs on NJ TRANSIT and/or Amtrak trains. These major service incidents required crews to be dispatched to identify, troubleshoot, and repair and/or replace assets, while other trains in the area followed speed restrictions or were canceled. These incidents each affected dozens of trains and caused over 1,250 train-delay minutes.

Portal Bridge also continues to experience issues with properly closing after scheduled openings, with its most recent major service incident occurring in August 2022. Specialized crews were dispatched to manually close the bridge, causing a nearly 2-hour service disruption affecting 58 trains and causing 1,300 train-delay minutes.

However, the most disruptive major service incidents were caused by weather-related events, accounting for nearly 24,000 train-delay minutes (or 39% of total train-delay minutes). Several severe thunderstorms and cold weather events affected train service across multiple states. The most disruptive weather-related major service incident occurred in August 2022 when lightning struck the corridor and signal power was lost between Washington, DC and Bowie, MD, causing over 5,300 total train-delay minutes for MARC and Amtrak services.

4. Challenges and Recommendations

Commission members are poised to usher in an historic era of reinvestment in the Northeast Corridor thanks to unprecedented federal funding support from IIJA. However, Commission members face challenges in ramping up their level of investment each year, and identifying and executing strategies to promote stronger adherence to project schedules and budgets.

The FY21 Annual Report laid out an early assessment of implementation barriers Commission members face in successfully putting IIJA funding into action and delivering the CONNECT NEC Program. The Commission's Implementation Working Group continued refining that assessment of challenges and the development of potential solutions in FY22. This section of the report provides an update on those efforts and recommendations for moving forward.

Implementation Coordination Program (ICP)

Interagency coordination breakdowns are a frequent source of project schedule delay on the NEC. In FY22, the Commission hired staff to develop an Implementation Coordination Program (ICP) to create and manage tools and efficient processes to facilitate implementation of funded project activities in the CONNECT NEC Program.

The initial phase of this effort involves drafting an ICP Plan which will define interagency coordination milestones for the Commission to monitor and recommend guidelines for how agencies communicate and collaborate to achieve those milestones on schedule. The draft ICP Plan milestones and guidelines focus on interagency activities regarding design management, agreements, workforce planning, and track outage planning. The milestone monitoring process will allow the Commission to play a neutral role in tracking project readiness from an interagency coordination perspective and support members by flagging schedule risks for resolution before they cause overall project delays. Commission staff will also be available to facilitate the resolution of disputes that often delay projects.

Committed involvement in the ICP by Commission member agencies is required to successfully deliver complex projects on a busy corridor through highly coordinated and productivity maximized track outages that minimize service disruptions. Active participation in FY23 requires Commission members to review and collaborate on the draft ICP Plan, socialize the ICP Plan's milestone monitoring process and recommended guidelines to all relevant departments within their organizations, and allocate resources to participate in a pilot program to test the milestone monitoring process.

Commission Member Internal Reforms

Commission members will have to make select reforms to their internal organizations, business practices, and data systems to effectively and efficiently collaborate with project partners, participate in the ICP, comply with reporting requirements, and measure capital delivery performance for themselves and their funding partners.

In early FY22, in response to IIJA passage, Amtrak underwent a restructuring and created a Capital Delivery (CAPD) organization to focus on developing and executing all non-recurring and non-IT capital projects, including fleet acquisitions and facility expansions and upgrades; major stations programs; infrastructure projects, including the Gateway Program; and major third-party projects. To support expanded efforts for coordination on capital improvements, Capital Delivery established a new office of Project Development and Planning Services (PDPS). This office houses new functions for short-, medium-, and long-range work coordination and outage planning, as well as additional resources for developing project-specific delivery strategies and the supporting project agreements. PDPS will not only help coordinate with NEC partners to prioritize capital improvements but also will aim to coordinate project needs with internal stakeholders and keep a focus on early program and project planning.

Amtrak and all NEC project sponsors need to continue to explore ways for internal reforms to best support the volume of project work to be undertaken. Amtrak and all NEC project sponsors also need to focus on developing data systems that reliably and efficiently provide all identified project cost, schedule, track outage, and production unit planning and reporting data to measure capital delivery performance and SOGR backlog reduction (see pages 16-17 and 24-27). In FY23, Commission members should develop these systems for the FY24 plan (anticipated publication in October 2023) and actuals in the FY24 Annual Report (anticipated publication in March 2025).

Workforce Development

Commission members need to deliver significant workforce growth to advance the ambitious investments proposed in CONNECT NEC. Amtrak is utilizing multiple tactics to grow to required levels. The company is utilizing larger classrooms or third-party conference halls for training, increasing its instructional staff and making other improvements to allow for training to occur on multiple shifts, and exploring training design and technological advancements with third-party organizations. Though also fighting employee attrition, Amtrak has successfully been able to double the number of new hires in technical fields.

In FY22, Amtrak hired 700 management employees and 3,000 agreement positions across the organization. Amtrak's FY23 plans calls for an additional 200 management positions in Capital Delivery. While Amtrak is staffing up, it is also focused on retaining existing employees so that new hires are growing the organization's total workforce.

The recruitment, training, and retention of a highly skilled construction workforce is needed to ensure infrastructure investments are delivered. An increase in the construction workforce must occur both at member agencies and within the broader private sector construction industry.

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Content continues on next page.

New England

Boston, MA to New Haven, CT
Springfield, MA to New Haven CT
BCC Segments 1-5, 25

Connecticut-Westchester (NHL)

New Haven, CT to New Rochelle, NY
BCC Segments 6-7

Mid-Atlantic North

Morrisville, PA to Bacon Interlocking in MD
Harrisburg, PA to Philadelphia, PA
BCC Segments 14-20, 28-30

New York City Metro

New Rochelle, NY to Morrisville, PA
BCC Segments 8-13, 27

Amtrak System-wide

All Amtrak-owned territory
BCC Segment 31

Mid-Atlantic South

Bacon Interlocking in MD to Washington, DC
BCC Segments 21-24

Project Information Appendix

Infrastructure Summary

FY22 Baseline Capital Charges (BCCs)	44
Beyond Expenditures	48

Operations Summary

Major Service Incidents	50
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Infrastructure and Operations Regional Detail

Operators may have service in more than one region listed below, but are profiled in a single region.

New England	54
Infrastructure Detail	
Operations: MBTA and CT <i>rail</i>	
Connecticut-Westchester (NHL)	66
Infrastructure Detail	
Operations: MTA Metro-North Railroad	
New York City Metro	74
Infrastructure Detail	
Operations: MTA Long Island Rail Road and NJ TRANSIT	
Mid-Atlantic North	86
Infrastructure Detail	
Operations: SEPTA	
Mid-Atlantic South	96
Infrastructure Detail	
Operations: MARC and VRE	
Amtrak System-wide	108
Infrastructure Detail	
Operations: Amtrak	

Appendix: Infrastructure Summary

Baseline Capital Charges (BCCs)

Figure A-1. BCC obligations by operator and owner territory, FY22

Capital renewal investments can be funded with Baseline Capital Charges (BCCs) allocated to operators¹ based on methods described in the NEC Commuter and Intercity Rail Cost Allocation Policy. According to the Policy, right-of-way owners must invest operators' BCCs on eligible assets within the operators' service territories in the year the BCCs are contributed.² Figure A-1 below shows the FY22 BCC obligations for each service operator by RoW owner territory.

		Right-of-Way Owner Territory				
Service Operator		Amtrak	MBTA	Connecticut DOT	Metro-North	Total
Amtrak		\$318.8 M	\$8.8 M	\$23.2 M	\$2.8 M	\$353.5 M
MBTA		\$2.2 M	\$19.5 M			\$21.7 M
Rhode Island DOT		\$3.2 M				\$3.2 M
Connecticut DOT	Shore Line East	\$4.1 M		\$0.5 M		\$4.6 M
	Hartford Line	\$8.4 M		\$0.4 M		\$8.8 M
	New Haven Line			\$66.4 M		\$66.4 M
MTA	Metro-North Railroad				\$13.3 M	\$13.3 M
	Long Island Rail Road ¹	\$22.7 M				\$22.7 M
NJ TRANSIT ²		\$117.9 M				\$117.9 M
SEPTA		\$34.5 M				\$34.5 M
Delaware DOT		\$3.3 M				\$3.3 M
MDOT MTA / MARC		\$17.7 M				\$17.7 M
VRE		\$1.1 M				\$1.1 M
Total FY22 BCC Obligations		\$533.9 M	\$28.3 M	\$90.5 M	\$16.1 M	\$668.8 M

Table notes: (1) LIRR's obligation is subject to revision based on actual expenditures per Amtrak-LIRR agreement. (2) NJ TRANSIT's BCC obligation reflects the NJ TRANSIT-Amtrak BCC variance for Portal North Bridge, approved by the Commission in August 2019.

¹ The Policy defines "operator" as an entity responsible for, or established to provide, commuter or intercity passenger rail transportation subject to the Policy. This includes Amtrak, the New York Metropolitan Transportation Authority, the Connecticut Department of Transportation, the Delaware Department of Transportation, the Maryland Department of Transportation, the Rhode Island Department of Transportation, the Southeastern Pennsylvania Transportation Authority, New Jersey Transit Corporation, the Massachusetts Bay Transportation Authority, Virginia Railway Express, any successor agencies, and any entity created to operate, or contract for the operation of, commuter or intercity passenger rail service.

² The Policy (Appendix 1.6.2.1 and Section 3.4.2.2) allows owners, under certain conditions, to invest an operator's BCCs beyond the year they are contributed. The Policy also allows owners to apply operators' BCCs to system-wide projects (investments that span multiple BCC segments and/or are not physically located in their service territory) if certain criteria are met.

Figure A-2. Actual BCC-eligible expenditure by operator and owner territory, FY22

RoW owners assign service operators' BCCs to fund eligible capital renewal investments. In some cases, RoW owners invest in their territory above the BCC obligated amount. Figure A-2 shows BCC-eligible expenditures by right-of-way owner territory as assigned to each service operator.

Right-of-Way Owner Territory					
Service Operator	Amtrak	MBTA	Connecticut DOT	Metro-North	Total
Amtrak	\$392.2 M	\$5.0 M	\$23.2 M	\$2.8 M	\$423.2 M
MBTA	\$2.2 M	\$11.2 M			\$13.4 M
Rhode Island DOT	\$3.2 M				\$3.2 M
Connecticut DOT	Shore Line East		\$0.5 M		\$4.6 M
	Hartford Line		\$0.4 M		\$8.8 M
	New Haven Line		\$70.2 M		\$70.2 M
MTA	Metro-North Railroad			\$13.4 M	\$13.4 M
	Long Island Rail Road	\$15.7 M			\$15.7 M
NJ TRANSIT	\$97.9 M				\$97.9 M
SEPTA	\$34.5 M				\$34.5 M
Delaware DOT	\$3.3 M				\$3.3 M
MDOT MTA / MARC	\$17.7 M				\$17.7 M
VRE	\$1.1 M				\$1.1 M
Total FY22 Actual Expenditure					
	\$580.3 M	\$16.3 M	\$94.3 M	\$16.1 M	\$707.0 M

Figure A-3. Comparison of actual BCC-eligible expenditure and BCC obligation, FY22

Figure A-3 shows the difference between FY22 capital renewal expenditures as assigned to each service operator and the FY22 BCC obligation for each operator. Collectively, right-of-way owners spent an additional \$38.3 million above BCC obligations on BCC-eligible work. Amtrak, Connecticut DOT, and Metro-North each spent at levels above the service operators' BCCs in their territories. However, MBTA spent \$12.0 million less than the BCC obligation in their territory.

Right-of-Way Owner Territory					
Service Operator	Amtrak	MBTA	Connecticut DOT	Metro-North	Total
Amtrak	\$73.5 M	-\$3.7 M	\$0.0 M	\$0	\$69.7 M
MBTA	\$0	-\$8.3 M			-\$8.3 M
Rhode Island DOT	\$0				\$0
Connecticut DOT	Shore Line East		\$0.0 M		\$0.0 M
	Hartford Line		\$0.0 M		\$0.0 M
	New Haven Line		\$3.8 M		\$3.8 M
MTA	Metro-North Railroad			\$0.0 M	\$0.0 M
	Long Island Rail Road ¹	-\$7.0 M			-\$7.0 M
NJ TRANSIT ²	-\$20.0 M				-\$20.0 M
SEPTA	\$0				\$0
Delaware DOT	\$0				\$0
MDOT MTA / MARC	\$0				\$0
VRE	\$0				\$0
Total FY22 Difference					
	\$46.5 M	-\$12.0 M	\$3.8 M	\$0.0 M	\$38.3 M

Table notes: (1) LIRR's obligation is subject to revision based on actual expenditures per Amtrak-LIRR agreement. (2) NJ TRANSIT's BCC obligation reflects the NJ TRANSIT-Amtrak BCC variance for Portal North Bridge, approved by the Commission in August 2019.

Figure A-4. BCC-eligible investments by BCC segment, FY22

		Amtrak BCCs	MBTA BCCs	Rhode Island DOT BCCs	Connecticut DOT BCCs		
					Shore Line East	Hartford Line	New Haven Line
1. BOS to MA/RI state line ¹	MBTA	\$5.0 M	\$11.2 M				
2. MA/RI state line to Providence	Amtrak	\$3.2 M	\$2.2 M				
3. Providence to Wickford Junction ²	Amtrak	\$2.9 M		\$3.2 M			
4. Wickford Junction to New London	Amtrak	\$7.3 M					
5. New London to New Haven	Amtrak	\$11.1 M			\$4.1 M		
6. New Haven to CT/NY state line	CTDOT	\$23.2 M			\$0.5 M	\$0.4 M	\$66.4 M
7. CT/NY state line to New Rochelle	Metro-North	\$2.8 M					
8. New Rochelle to Harold	Amtrak	\$5.8 M					
9. Harold to F Interlocking	Amtrak	\$14.2 M					
10. F Interlocking to Penn Station NY	Amtrak	\$1.4 M					
11. Penn Terminal	Amtrak	\$30.9 M					
12. Penn Station NY to Trenton	Amtrak	-					
13. Trenton to Morris	Amtrak	\$0.4 M					
14. Morris to Holmes	Amtrak	\$8.8 M					
15. Holmes to Shore	Amtrak	\$4.8 M					
16. Shore to Girard	Amtrak	\$25.4 M					
17. Girard to Philadelphia 30th Street	Amtrak	\$13.3 M					
18. Philadelphia 30th St to Arsenal	Amtrak	\$2.3 M					
19. Arsenal to Marcus Hook	Amtrak	\$36.4 M					
20. Marcus Hook to Bacon ³	Amtrak	\$19.1 M					
21. Bacon to Perryville	Amtrak	\$23.3 M					
22. Perryville to WAS	Amtrak	\$45.6 M					
23. Washington Union Terminal	Amtrak	\$9.2 M					
24. WAS to CP Virginia	Amtrak	\$0					
25. Springfield to New Haven	Amtrak	\$20.5 M				\$8.4 M	
27. Spuyten Duyvil to PSNY	Amtrak	\$23.8 M					
28. Penn to 36th St	Amtrak	-					
29. 36th St to Thorndale	Amtrak	-					
30. Thorndale to Harrisburg	Amtrak	\$9.0 M					
31. Amtrak System-wide	Amtrak	-					
FY22 total BCC-eligible expenditure by operator		\$349.7 M	\$13.4 M	\$3.2 M	\$4.6 M	\$8.8 M	\$66.4 M

Table notes: (1) In BCC segment 1, MBTA spent below the BCC obligation of \$28.3 million. BCCs were allocated proportionally per the Cost Allocation Policy. Per agreement by MBTA and Amtrak, unspent FY18-22 BCCs in MBTA-owned territory will be used as the local match for the Federal-State Partnership for State of Good Repair Grant obtained by MBTA for Tower 1 Interlocking. (2) In BCC segment 3, MBTA operates on behalf of RIDOT, while RIDOT is responsible for charges in this segment. (3) In BCC segment 20, SEPTA operates under contract with DelDOT, while DelDOT is responsible for charges in this segment. (4) Subject to revision per Amtrak-LIRR agreement.

MTA BCCs		NJ TRANSIT BCCs	SEPTA BCCs	Delaware DOT BCCs	MDOT MTA / MARC BCCs	VRE BCCs	Other Capital Funds	FY22 total BCC-eligible expenditure
Metro-North Railroad	Long Island Rail Road ⁴							
							-	\$16.3 M
							-	\$5.4 M
							-	\$6.1 M
							-	\$7.3 M
							-	\$15.2 M
							\$3.8 M	\$94.3 M
\$13.3 M							\$0.0 M	\$16.1 M
							-	\$5.8 M
	-						-	\$14.2 M
	\$2.1 M	\$1.2 M					\$0.0 M	\$4.6 M
	\$13.7 M	\$6.8 M					-	\$51.4 M
		\$89.3 M					-	\$89.3 M
		\$0.6 M	-				-	\$1.1 M
			-				-	\$8.8 M
			-				-	\$4.8 M
		-	-				-	\$25.4 M
		-					-	\$13.3 M
							-	\$2.3 M
			\$0.3 M				-	\$36.7 M
				\$3.3 M			-	\$22.4 M
							-	\$23.3 M
					\$17.7 M		-	\$63.3 M
					-	\$0.9 M	-	\$10.1 M
						\$0.2 M	-	\$0.2 M
							-	\$28.9 M
							-	\$23.8 M
							-	\$34.1 M
			\$34.1 M				-	-
							\$12.1 M	\$21.1 M
							\$61.3 M	\$61.3 M
\$13.3 M	\$15.7 M	\$97.9 M	\$34.5 M	\$3.3 M	\$17.7 M	\$1.1 M	\$77.3 M	\$707.0 M

Beyond Expenditures

Infrastructure delivery reporting has expanded the metrics used to assess plan adherence through FY22 and beyond

As outlined in the FY21 Annual Report, the Commission continues to work with all right-of-way infrastructure owners and project sponsors to expand the variety of metrics used to report on plan adherence. In addition to assessing plan adherence against expenditures, additional metrics related to units delivered through capital renewal production programs and project milestones have been tracked throughout the fiscal year. The Commission will continue to advance these and other metrics as measures of plan adherence and infrastructure investment productivity.

Capital renewal production program units delivered

Units delivered by Amtrak capital renewal production program, FY22

Program	Unit Type	FY22 Units			FY22 Expenditure		
		Plan	Actual	% of Plan	Plan	Actual	% of Plan
Fence Upgrades Program. C.EN.101854	Install RoW Fencing (FT)	45,696	29,254	64%	\$14.8	\$9.9	67%
Production High Speed Surfacing Program. C.EN.101855	Surface Track (FT)	1,868,327	702,949	38%	\$16.7	\$19.5	117%
Production Wood Tie/ Timber Replacement Program. C.EN.101858	Install Ties	45,824	25,502	56%	\$15.5	\$20.4	131%
Rail Replacement Program. C.EN.101856	Install Rail (FT)	82,600	71,604	87%	\$12.2	\$11.9	98%
TLS Concrete Tie Replacement Program. C.EN.101652	Install Rail (FT)	152,698	112,330	74%	\$41.9	\$34.0	81%
	Install Ties	38,174	28,406	74%			
Total Track Renewal Program. C.EN.101871	Install Block Ties	4,578	3,360	73%	\$10.4	\$8.0	77%
Track Rehabilitation Program. C.EN.101859	Install Turnouts	8	5	63%	\$4.6	\$4.3	94%
Track Undercutting Program. C.EN.100269	Undercut Track (FT)	75,662	21,101	28%	\$23.1	\$11.3	49%
Turnout Renewal Program. C.EN.101860	Install Turnouts	61	47	77%	\$74.0	\$63.9	86%

Units delivered by MBTA capital renewal production program, FY22

Program	Measure	FY22 Units			FY22 Expenditure		
		Plan	Actual	% of Plan	Plan	Actual	% of Plan
CWR Replacement	Feet	4,000'	4,795'	120%	\$1.0	\$0.8	79%
Insulated Joint	Units	20	20	100%	\$0.2	\$0.2	149%
Interlocking Crossover Replacement	Units	2	1	50%	\$2.1	\$0.5	25%
Interlocking Steel Replacement	Units	5	5	100%	\$0.4	\$0.4	98%
Joint Elimination	Units	50	124	248%	\$0.3	\$0.7	263%
M3 Switch Machine	Units	8	1	13%	\$0.2	\$0.2	93%
Out Of Face Surfacing	Feet	80,000'	31,861'	40%	\$2.3	\$0.2	7%
RoW Fence Upgrades	Feet	3,200'	0	0%	\$1.4	\$0.0	0%
Spot Surfacing	Feet	60,000'	75,939'	127%	\$1.6	\$3.6	216%
Spot Undercutting	Feet	150'	100'	67%	\$0.3	\$0.1	32%
Tie/Timber Replacement	Units	1,500	1,695	113%	\$2.6	\$3.7	145%
Tree Cutting	Weeks	50	0	0%	\$1.1	\$0.0	0%

Project milestones

Project milestones achieved by submitting agency FY22

Submitting agency	Planned for FY22 (CIP)	Achievement in FY22		Additional milestones added	
		Achieved	Estimated in FY23+	Achieved	Estimated in FY23+
Amtrak	122	45	77	35	34
MBTA	9	3	6	7	11
Rhode Island DOT	14	9	5	0	0
Connecticut DOT	16	3	13	10	14
MTA	15	7	8	3	7
NJ TRANSIT	5	5	0	10	17
SEPTA	5	1	4	1	8
Pennsylvania DOT	10	6	4	0	0
Delaware DOT	6	1	5	0	1
MDOT MTA / MARC	4	0	4	0	12
VRE	1	0	1	0	0
Total	207	80	127	66	104

Appendix: Operations Summary

Major Service Incidents

Major service incidents are single events that can generate multiple train delays. Major service incidents on the NEC were identified by analyzing daily train performance data and cross-referencing that data with the contents of NEC operators' rail operations and incident reports. This approach may not capture all significant events in FY21 because it identifies major service incidents based on service impacts, which are dependent on the location and time of day of the incident, not necessarily the severity or significance of the event.

Figure A-5. Major service incidents by date, FY22

	Date, start time, and duration	Cause of Delay Category	Location and description	Total trains affected	Total train-delay minutes	Total trains not completed
Quarter 1 (7 major service incidents)				807	13,768	80
1	10/14/2021	Infrastructure	Location: Swift to Bergen, Secaucus, NJ Description: At 9:29 AM, NJT trains reported began damage to their pantograph while passing from Swift to Bergen. Trains stopped at Secaucus to inspect and discharge passengers. At 9:43 AM, a train reported striking debris west of the North Tube followed by a flash and loss of catenary power. Single track operation was placed in effect resulting in numerous delays to NJT and Amtrak trains. A cat car was dispatched and found damaged section breaks on track two and three which had ripped off the pantographs of passing trains. Repairs were made late at night before service resumed the following day.	38	1,683	11
2	10/27/2021	Weather	Location: MBTA Service Area Description: On October 26, an overnight storm downed trees across Massachusetts leading to MBTA service impacts. Several of the commuter rail lines experienced delays due to the downed trees when service began on October 27.	122	2,740	39
3	10/29/2021	Weather	Location: NEC Service Area Description: A slow-moving storm traveled up the corridor between October 29 and 30. Various operators reported operational delays caused by slippery rail and slow passenger loading.	267	2,395	7
4	11/5/2021	Third Party	Location: Fordham Station, Bronx, NY (Off-Corridor) Description: At 6:37 PM, A trespasser was reported walking west of Fordham Station (off-corridor). The trespasser laid on the tracks and ran between stopped trains as they attempted to evade police. The incident caused significant delays for MNR trains going to and from Grand Central station.	24	1,135	4
5	11/5/2021	Infrastructure	Location: Kay Interlocking, Philadelphia, PA (Off-Corridor) Description: During the PM peak a catenary power was lost at Kay interlocking caused sizable delays across many SEPTA routes.	57	1,531	3
6	11/12/2021	Weather	Location: Boston to Philadelphia Description: A severe thunderstorm crossed over the corridor from Philadelphia to Boston. Trees and branches were downed across the corridor but there were no major failures. Delays were mostly caused by wheel slip and slow loading.	243	3,123	13
7	12/23/2021	Infrastructure	Location: Tower 1, Cove, Broad, Loop, South Bay, and Cabot Interlockings, Boston, MA Description: A 2:02 PM signal power was lost throughout Tower 1, Cove, Broad, Loop, South Bay, and Cabot interlockings. Dispatching had no control over any of those Interlockings. Control was reestablished within the hour, but issues reoccurred on the Dorchester for the remainder of the day.	56	1,161	3

Appendix: Operations Summary - Major Service Incidents

	Date, start time, and duration	Cause of Delay Category	Location and description	Total trains affected	Total train-delay minutes	Total trains not completed
Quarter 2 (6 major service incidents)				534	13,675	89
8	1/26/2022	Third Party	Location: MP 117.3, Odenton, MD Description: At 3:15 PM a westbound MARC struck a trespasser between Odenton and Bowie State University Stations. A hold was placed on all tracks for an hour to allow the police and fire department to access the site. Track one was opened at restricted speeds before the railroad was fully reopened at 7 PM. Trains traveling through the Baltimore area were canceled or heavily delayed.	22	1,431	7
9	1/31/2022	Weather	Location: Delaware to Massachusetts Description: On January 31, a blizzard Atlantic coast from Canada down to Delaware. Cities along the coast, like New York and Boston were particularly hard hit, causing numerous delays from slow loading and travel. At New York Penn Station, ice developed in one of the switches at "A" interlocking causing severe delays for NJ TRANSIT during the morning rush.	145	4,192	43
10	2/2/2022	Mechanical	Location: South Tube, North River Tunnel, NY-NJ Description: Early morning trains reported intermittent power loss when traveling between at 4:40 the south tube was taken out of service between "A" and Bergen to allow for catenary inspections. During the inspection a catenary car became disabled in the south tube. A rescue engine was sent to tow the disabled vehicle, but the tow bar snapped delaying the rescue. By 8:48 the equipment was cleared, and the South Tube was returned to service but heavy delays and cancellations resulted.	181	2,736	23
11	2/2/2022	Mechanical	Location: JO Interlocking, East River Tunnel, NY Description: The pantograph of an NJ TRANSIT train broke and became tangled in the catenary wires west of "JO" interlocking. AC power was off from Harold West through ERT Line 1 to New York Penn Station Tracks 8, 9, 10, and 11. Upon inspection ET reported extensive damage to the catenary and attendant infrastructure from the pantograph. ET personnel on the scene were unable to secure the pantograph. It was necessary for a catenary car to respond to complete the process. Numerous delays to Amtrak, NJ TRANSIT and LIRR resulted while the incident was being resolved.	105	3,323	16
12	2/4/2022	Weather	Location: Transfer, Mansfield, Forest, Read, Post, and Plains Interlockings, MA-RI Description: A severe winter storm caused intermediate switch and signal issues at various locations. The incidents were each resolved within an hour but occurred at random throughout the day.	36	889	0
13	3/14/2022	Infrastructure	Location: CP 212 - CP 273, NY Description: At 7:28 PM, Metro-North reported signal power loss between CP212 and CP273. Maintainers arrived at CP 216 to line routes to the Hell Gate Line and Metro-North Territory. Signal issues were not resolved until 12:27 AM. Trains were heavily delayed due to single tracking.	45	1,104	0
Quarter 3 (7 major service incidents)				339	11,097	77
14	5/4/2022	Third Party	Location: CP229, Cos Cob, CT Description: At 5:36 PM a westbound Metro-North train struck a trespasser on Track 1 at CP229 just west of the Cos Cob bridge. A hold was placed on Track 1 and Track 3 between CP229 and CP230. Overhead power was de-energized to allow emergency responders to access the site. A hold was placed on Track 2 for an hour starting at 8 PM. Holds on Track 1 and Track 3 were lifted with no restrictions at 10 PM. Trains traveling through this area were canceled or heavily delayed.	57	1,250	8
15	5/21/2022	Infrastructure	Location: CP223 - CP217, NY Description: At 4:16 PM a Metro-North train was identified without power at Larchmont station. 10 minutes later a code yellow was in effect with the power director reporting a ground to the overhead wire on all tracks between CP223 and CP217. Shortly after 7 PM, overhead power was restored on all tracks. Trains traveling through this area were canceled or heavily delayed.	28	1,008	12

Appendix: Operations Summary - Major Service Incidents

	Date, start time, and duration	Cause of Delay Category	Location and description	Total trains affected	Total train-delay minutes	Total trains not completed
16	5/21/2022	Infrastructure	Location: MP 27.0, Metuchen, NJ Description: At 11:09 AM an NJT train on Track 1 at MP 27.0 reported losing catenary power. Upon inspection a bend was noticed in the pantograph. At 5:15 PM Track 1 was placed out of service between Menlo and County while repairs were made. By 10:45 PM linemen replaced broken hangers at Metuchen and service was restored to Track 1. Numerous trains traveling through this area were canceled or heavily delayed.	56	1,565	12
17	5/26/2022	Infrastructure	Location: New York Penn Station, NY Description: At 6:36 AM four tripped circuit breakers were reported at A Interlocking with smoke coming from an NJ TRANSIT train and parted wire on Track 12. The incident was determined to be caused by a broken pantograph and the damaged catenary was fixed by the cat car. Several trains traveling through this area were canceled or heavily delayed due to single tracking from Bergen to New York Penn Station.	78	1,995	14
18	6/11/2022	Infrastructure	Location: MP 25.3, Metuchen, NJ Description: At 5:53 PM, an Amtrak train and an NJ TRANSIT train both reported damaged pantographs at Lincoln Interlocking and the power director reported a loss of power on Track 4. 20 minutes later an Amtrak train reported a broken steady span on a cat pole west of the Grove Ave undergrade bridge. Speed restrictions were issued for Track 1 and Track 2 from Lincoln to Menlo and Track 3 and Track 4 from Union to County were held. By 3:45 AM all tracks returned to service with no restrictions.	31	1,352	5
19	7/18/2022	Weather	Location: New Jersey to Connecticut Description: A large storm across the New York area caused numerous delays from several separate incidents. In Connecticut, overhead power was lost on the New Canaan branch after wind blew a tree into the overhead wire and caught on fire. There was significant flooding from CP215 to CP217 at New Rochelle. In addition, there was weather related congestion from wind and rain in New Jersey leading to delays into New York Penn Station.	112	2,798	24
20	7/21/2022	Weather	Location: Zoo Interlocking, Philadelphia, PA Description: At 2:30pm, the train director reported track 1 catenary at zoo interlocking sagging due to excessive heat and causing pantographs to lock in the closed position. At 4:17pm, a foreman took track 1 out of service from Kay to Overbrook. By 7:58pm, linemen adjusted the catenary tension, power was restored, and track 1 was returned to service.	37	1,129	2
Quarter 4 (12 major service incidents)				629	22,455	192
21	8/1/2022	Third Party	Location: MP 32.2, New Brunswick, NJ Description: At 3:08pm, a westbound NJT struck a trespasser on track 4 at MP 32.2 just east of County Interlocking. At 3:14pm, a hold was placed on all tracks. At 3:53pm, the hold was released on tracks 1-3 with restricted speed from MP32 to County. By 6:18pm all tracks returned with no speed restrictions.	51	1,328	10
22	8/3/2022	Third Party	Location: Cos Cob Station, Cos Cob, CT Description: At 3:35pm, a westbound Metro-North train struck a trespasser at Cos Cob station. Police and EMS arrived on the scene and many Metro-North trains did not stop at Cos Cob station while the incident was being investigated.	49	919	0
23	8/5/2022	Weather	Location: Washington Union Station to Bowie, MD Description: Around 5pm, lightning struck the corridor and signal power was lost between Washington and Bowie. Power was restored later that evening. Trains traveling through this area were canceled or heavily delayed.	64	5,346	17

Major NEC incidents by date, FY22 continued on the next page >>

Appendix: Operations Summary - Major Service Incidents

	Date, start time, and duration	Cause of Delay Category	Location and description	Total trains affected	Total train-delay minutes	Total trains not completed
24	8/9/2022	Infrastructure	Location: Line 1, East River Tunnel, NY Description: At 11:20am, track inspectors found a broken rail in East River Tunnel line 1 east of F interlocking. By 8:19pm, the track department repaired the broken rail and returned the track to normal service.	60	759	9
25	8/10/2022	Weather	Location: D.C. and Maryland Description: A late afternoon, early evening storm caused flash flooding in the D.C. area and a downed tree on the VRE Manassas Line leading to significant delays in and out of Union station.	28	1,184	3
26	8/23/2022	Mechanical	Location: Bergen Interlocking, NJ Description: At 5:33pm, a westbound NJT train reported smoke. At 5:39pm, the train reported a fried pantograph and power directors re-energized lines and held trains. Circuits were tripped between Sub 41 (Kearny) and Sub 43 (31St St). At 9:01pm, Linemen secured the damaged pantograph and broken hangers at Bergen. By 2:02am, repairs to hangers were repaired and service was restored with no restrictions.	114	4,562	57
27	8/25/2022	Infrastructure	Location: Portal North Bridge, NJ Description: After a 10:21am scheduled opening of the Portal North Bridge, the wedges on the bridges were unable to align. B&B and C&S crews attempted to resolve the issue and drive wedge manually. The bridge was properly closed, and service resumed at 12:11pm.	58	1,329	29
28	8/26/2022	Mechanical	Location: A Interlocking, South Tube, NY Description: At 9:19am, eastbound NJ3930 reported an outage three car lengths west of A interlocking in the south tube. Power directors confirmed the outage and restored power at 9:23am. Multiple trains were granted permission for a reverse move. NJ3930 arrived NYP at 10:14am and both tubes open.	39	1,128	2
29	9/7/2022	Third Party	Location: MP 10, Hell Gate, New York, NY Description: At 11am, metal sheet debris from Hunts Point Ave. overhead bridge at MP10 fell on the catenary, breaking the wires. Speeds were restricted on tracks 1 and 2 until repairs were made to the wire. All tracks returned to service at 5:36pm.	20	1,649	4
30	9/27/2022	Third Party	Location: MP 83.3, North Philadelphia Description: At 5:49pm, a scrap yard fire started next to the right of way at MP 83.3 just east of North Philadelphia Station. Amtrak police reported that flames caused the catenary to spark and requested a shut down on all tracks. At 7:10pm, signal power was lost on all tracks from Zoo to Holmes due to the fire melting signal power lines. At 7:25pm, the hold on tracks 1 and 2 was released with restricted speeds from MP83 to MP84 and Amtrak restored service on tracks 1 and 2 operating through the dark signals. Signal power was incrementally restored from 8:15pm to 12:20am. By 4:51am, catenary power was restored on tracks 3 and 4 and by 5am, all service was returned with no restrictions.	53	1,573	29
31	9/27/2022	Third Party	Location: MP 127, New Carrollton, MD Description: At 5:05pm, an eastbound Amtrak Train struck a trespasser at MP 127, just north of New Carrollton station. At 5:29pm police placed a hold on all tracks. At 6:48pm, service was restored to tracks 1 and 3 at restricted speed from MP126 to MP128. All holds were released at 9:04pm.	20	1,106	7
32	9/28/2022	Mechanical	Location: Fair Interlocking, Trenton, NJ Description: At 11am, a SEPTA train derailed traveling west from track 5 to 4 at Fair Interlocking, fouling track 3. Service on tracks 1 and 2 were restored at restricted speed by 12pm. The derailed train was re-railed and all tracks were in service by 1:50am.	73	1,572	25
FY22 Total (32 major incidents)				2,369	60,995	438

Region: New England

Infrastructure and Operations Detail

Operators: Amtrak, MBTA, CTrail

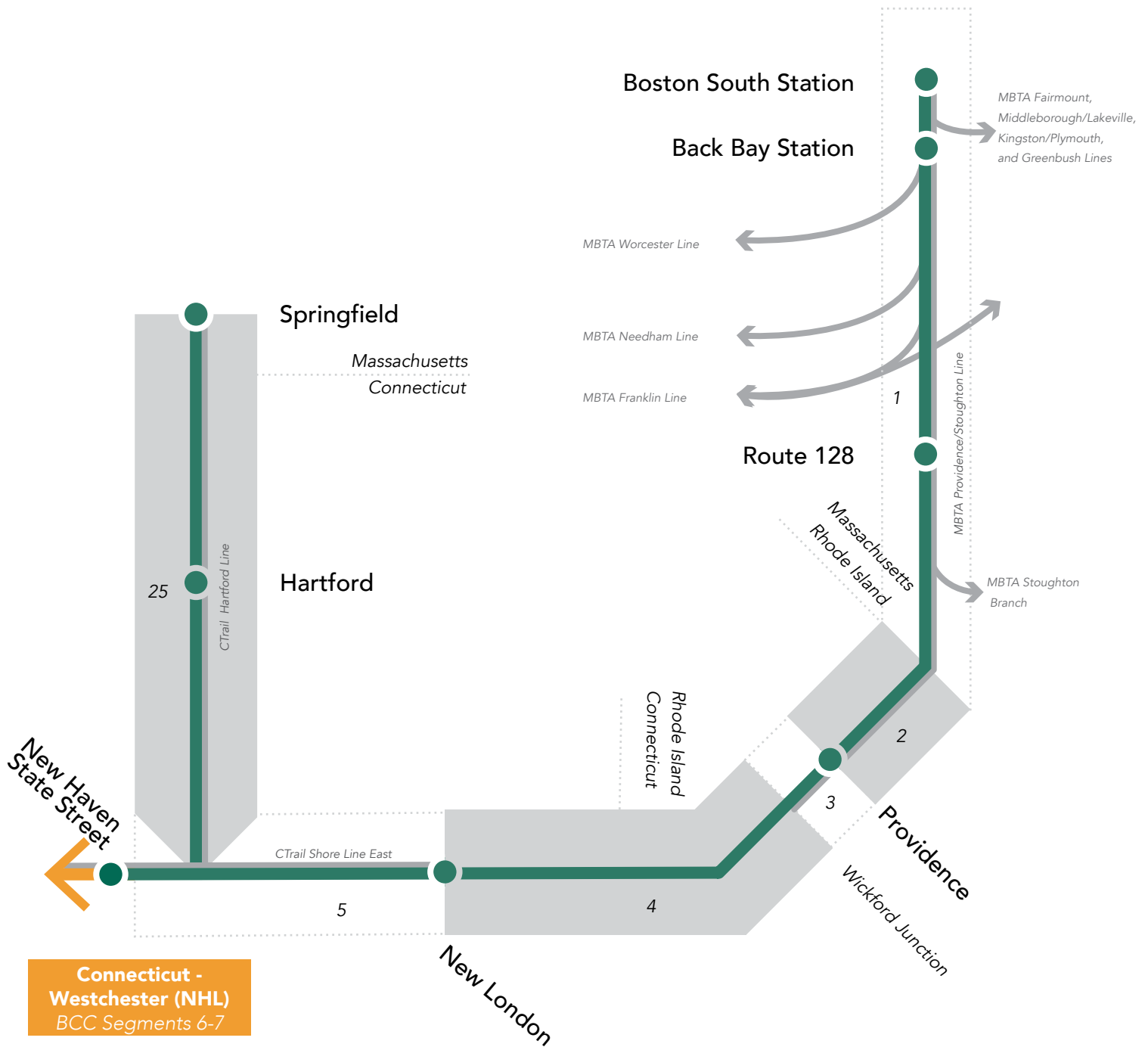
RoW Owners: MBTA, Amtrak

BCC Segments

- 1: Boston South Station to MA/RI State Line
- 2: MA/RI State Line to Providence
- 3: Providence to Wickford Junction
- 4: Wickford Junction to New London
- 5: New London to New Haven
- 25: Springfield to New Haven

New England

BCC Segments 1-5; 25



Not all intermediate stations shown.

Infrastructure

Amtrak, Massachusetts DOT, Rhode Island DOT, and Connecticut DOT coordinate on work throughout the New England region. In total, \$47 million was invested in FY22 (68% of plan).

10 largest investments by FY22 actual expenditure, New England

1. New England Track Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$11.1 M	Replace wood ties, concrete ties, interlocking steel, and insulated joints as well as continue joint elimination across the AS Line in Connecticut and Massachusetts and the AB Line in Connecticut and Rhode Island. Perform ride quality, drainage, and road bed improvements through spot surfacing, spot undercutting, spot rock scaling, ditching and grading across the AS Line in Connecticut and Massachusetts and the AB Line in Connecticut and Rhode Island. Continue design phase for slope stabilization at MP59.5 on the AS Line.
FY22 Actual Expenditure & Accomplishments	\$17.1 M	<ul style="list-style-type: none"> • Spot Surfacing - Completed 250,313 feet of spot surfacing this period. • Spot Undercutting - Completed 7,729 feet of spot undercutting this period. • Wood Tie/Timbers - Replaced 3,453 wood tie/timbers this period. • Joint Elimination - Completed 105 welds this period. • Concrete Tie/Timbers - Replaced 339 concrete ties this period. • Interlocking Steel - Replaced four frogs. Insulated Joints - Replaced 42 insulated joints this period. • AS 59.5 Slope Stabilization - Completed early action effort to undercut and shift tracks. Continued design phase for slope stabilization.
Variance & Explanation	\$6.0 M	Program overspent based on completing more scope than planned as well as adjustments to labor and material overheads at the end of the fiscal year.
2. Pawtucket/Central Falls Station (Rhode Island DOT)		
FY22 Planned Expenditure & Scope	\$17.8 M	Complete construction of NB and SB platform; continue pedestrian access via ramps, stairs, elevator and pedestrian bridge; install mechanical, electrical and plumbing items; install signage, landscaping, and conduct commissioning for anticipated summer revenue start.
FY22 Actual Expenditure & Accomplishments	\$10.6 M	<p>Significant construction progress was achieved in FY22 by completing installation of foundations; platforms; pedestrian bridge steel; ramp and stair accessibility; including roofing and architectural finish metal panel work; where mechanical, plumbing and electrical rough-in and finish work remains ongoing proceeding toward substantial completion by Q2 FY23.</p> <ul style="list-style-type: none"> ☑ Complete foundations for NB & SB platform and elevator: Achieved Oct 2021 ☑ Complete Retaining Wall Construction: Achieved Oct 2021 ☑ Complete installation of pedestrian bridge structure: Achieved Nov 2021 ☑ Complete installation of SB platform decking: Achieved Aug 2022 ☑ Complete site lighting installation: Achieved Sep 2022 ➡ Complete elevator installation: <i>Now estimated Dec 2022</i> ➡ Complete mechanical, electrical, and plumbing work: <i>Now estimated Dec 2022</i> ➡ Complete relocation of overhead catenary system: <i>Now estimated Jan 2023</i> ➡ Begin revenue service, commissioning: <i>Now estimated Jan 2023</i>
Variance & Explanation	-\$7.2 M	We revised FY22 Planned Expenditures in Q1 but the remaining variance is due to predicted versus actual progress achieved and the value of completed work versus the balance to complete.
3. New England Structures Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$10.2 M	Complete the steel upgrades and bridge timber replacement at the Conn. River Bridge (CT49.73) on the AS Line and replace the bridge timbers on the Conn. River Bridge (CT106.89) on the AB Line. Procure equipment for the replacement of the gearbox at CT132.16 Mystic River Bridge along with several other SOGR projects at the movable bridges on the AB Line. Design projects include Hartford Tunnel Drainage Improvements and culvert upgrades on the AS line.
FY22 Actual Expenditure & Accomplishments	\$9.6 M	CT49.73 CT River Bridge - Contractor mobilized and substantially completed steel and bearing upgrades. B&B began installation of bridge timbers. CT106.89 CT River Bridge Timbers - Began bridge timber procurement. Fairview Ave. Bridge Timbers - Completed bridge timber replacement. Shaws Cove Wedge Screw Jack - Replaced wedge screw jack. Mystic River Gearbox - Material delivered for FY23 installation. Hart Tunnel Drainage Improvements - Began design phase for project. Drive Motors - Replaced drive motors at Mystic River and Connecticut River Moveable Bridges.
Variance & Explanation	-\$0.6 M	Program substantially completed scope per plan and finished with a budget variance of approximately 6% in FY22.

Investment detail including expenditures, accomplishments, and explanation of variances are published as submitted by agencies.

10 largest investments by FY22 actual expenditure, New England (cont.)

4. Fitter Interlocking (Amtrak)		
FY22 Planned Expenditure & Scope	\$12.7 M	On-boarding of GC for construction, perform civil work and re-align tracks, install catenary structures and elevated platforms for signal houses.
FY22 Actual Expenditure & Accomplishments	\$6.4 M	<p>On-boarded general contractor for civil, foundations, steel, electrical, and catenary work, in April, 2022. Received CTDEEP 401 water quality permit. Lancaster shop completed and delivered the CIH and related cases to the yard in Groton in February, 2022. The GC fully mobilized, began foundation installation, wetland mitigation work, and began materials procurement. Amtrak signal gangs completed cross track digs, and the track department built construction crossings for the contractor work.</p> <ul style="list-style-type: none"> ☑ C&S complete cable relocation: Achieved Dec 2021 ☑ Lancaster Shop to complete construction and delivery of Location 'A' and related cases: Achieved Feb 2022 ☑ Issue Notice to Proceed to General Contractor: Achieved Mar 2022 ➡ Complete catenary foundation installation and begin pole erection: <i>Now estimated Mar 2023</i> ➡ Complete steel platforms for signal facilities: <i>Now estimated Oct 2023</i>
Variance & Explanation	-\$6.2 M	The originally planned NTP of October 2021 was delayed due to significantly higher than estimated price proposals and need for an ECR to increase LOP. Contractor did not receive NTP until March, 2022. All track outages were deferred to FY23. Contractor's initial spend plan indicated higher invoicing, however the drilling subcontractor underperformed initially, and planned 2022 drainage work was deferred to the spring of 2023, resulting in a large variance in spending vs planned.
5. Tie/Timber Program (MBTA)		
FY22 Planned Expenditure & Scope	\$2.6 M	Replace 1,500 ties/timbers - MP190.9 - MP229.0
FY22 Actual Expenditure & Accomplishments	\$3.7 M	Completed the replacement of 1,695 tie/timbers in FY23.
Variance & Explanation	\$1.2 M	Focused tie/timber replacement at turnouts and crossovers which has lower production rates than mainline tie/timber replacement.
6. Ruggles Street Station Accessibility Improvements: Phase 1 (MBTA)		
FY22 Planned Expenditure & Scope	\$1.0 M	Complete project closeout, pay contractor retainer and remaining PS invoices
FY22 Actual Expenditure & Accomplishments	\$3.7 M	<p>Negotiated and signed final agreement with Surety and Contractor for outstanding construction claims. Awaiting final retainer release.</p> <ul style="list-style-type: none"> ☑ Substantial Completion: Achieved Dec 2021 ➡ Final Completion: <i>Now estimated Feb 2023</i> ➡ Closeout Completion: <i>Now estimated Apr 2023</i>
Variance & Explanation	\$2.7 M	Withheld payment till agreement signed with Surety. Recently processed outstanding payments after agreement signed.
7. Spot Surfacing Program (MBTA)		
FY22 Planned Expenditure & Scope	\$1.6 M	50,000 Feet of Spot Surfacing - MP190.9 - MP229.0
FY22 Actual Expenditure & Accomplishments	\$3.6 M	Completed 75,939 feet of spot surfacing in FY23.
Variance & Explanation	\$1.9 M	Scope completed within 1% of plan.

Investment detail including expenditures, accomplishments, and explanation of variances are published as submitted by agencies.

10 largest investments by FY22 actual expenditure, New England (cont.)

8. Connecticut River Bridge Replacement Project (Amtrak)		
FY22 Planned Expenditure & Scope	\$8.2 M	Submission of 100% design documents sealed and stamped. Project is undergoing NEPA re-evaluation.
FY22 Actual Expenditure & Accomplishments	\$3.3 M	<p>1) Commenced Section 106 - Phase III Data Recovery Archeology Field Investigation.2) Prepared and submitted pre-final 100% design.3) Prepared external Construction Management RFP. 4) Commenced external Construction Management procurement process.5) Obtained concurrence approvals from CTDEEP Commissioning departments. 6) Continuous coordination with CTDEEP (LWRD, LAM, NDDB and LAM departments).7) Preparation and submission of multiple pre-consultation applications to regulatory agencies. 8) Completed USFWS consultation.</p> <ul style="list-style-type: none"> ➔ Complete RFP Procurement Process: <i>Now estimated Jan 2023</i> ➔ Final Stamped and Sealed 100% Design Documents issued: <i>Now estimated Feb 2023</i> ➔ Advertise RFP for 3rd Party Contractor: <i>Now estimated Mar 2023</i> ➔ Issue NTP 3rd Party Contractor: <i>Now estimated Oct 2023</i>
Variance & Explanation	-\$4.9 M	The pre-consultation process is taking longer than anticipated which is delaying the preparation and submission of the bridge permit, completing the final design and procurement of the 3rd Party contractor.
9. Hartford Line Station Program (Design) (Connecticut DOT)		
FY22 Planned Expenditure & Scope	\$0	Not in FY22-26 CIP (includes design elements for Windsor, Windsor Locks, Enfield, and North Haven Station projects)
FY22 Actual Expenditure & Accomplishments	\$2.9 M	Completed environmental review for North Haven Station and achieved 30% design milestone. Design coordination between CTDOT, Amtrak, and FRA is continuing on the Enfield Station project as it advances into final design.
Variance & Explanation	\$2.9 M	Design portion of projects was broken out from separate station construction projects. Additional coordination on project design was required, extending the design timeline.
10. Ruggles Street Station Accessibility Improvements: Phase 2 (MBTA)		
FY22 Planned Expenditure & Scope	\$0.4 M	Complete final design and begin construction activities
FY22 Actual Expenditure & Accomplishments	\$2.7 M	<p>100% Design Milestone achieved</p> <ul style="list-style-type: none"> ☑ Complete 100% Design: Achieved Aug 2022
Variance & Explanation	\$2.3 M	Additional scope was added to the project and the overall design had to be adjusted to accommodate the additional level of effort.. The station is a large multimodal station that has 4 ground transportation modes available. The additional coordination with internal and external stakeholders have resulted in additional expenditure.

Investment detail including expenditures, accomplishments, and explanation of variances are published as submitted by agencies.

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All New England investments by submitting agency

Investment Name	FY22 Planned Expenditure	FY22 Actual Expenditure	Variance
Amtrak			
Cedar Hill Remediation	\$0.5 M	\$0.0 M	-\$0.5 M
Connecticut River Bridge Replacement Project	\$8.2 M	\$3.3 M	-\$4.9 M
Fitter Interlocking	\$12.7 M	\$6.4 M	-\$6.2 M
Guilford Interlocking Renewal	\$0.5 M	\$0.0 M	-\$0.5 M
Intercity Trainset (ICT) Maintenance Facilities: Southampton Street Yard	\$0	\$1.3 M	\$1.3 M
New England Catenary Program	\$0.6 M	\$0.6 M	-\$0.0 M
New England Communications Program	\$1.4 M	\$1.3 M	-\$0.1 M
New England Facilities Program	\$1.0 M	\$2.7 M	\$1.7 M
New England Signals Program	\$3.7 M	\$2.1 M	-\$1.5 M
New England Structures Program	\$10.2 M	\$9.6 M	-\$0.6 M
New England Substations Program	\$1.3 M	\$0.6 M	-\$0.7 M
New England Track Program	\$11.1 M	\$17.1 M	\$6.0 M
New Haven, CT - Customer Now Station Refresh Program	\$0	\$0.2 M	\$0.2 M
Next Generation Acela Infrastructure Upgrades: Southampton Yard	\$0	\$0.6 M	\$0.6 M
Pawcatuck River RI Bridge Replacement Project	\$0.5 M	\$0.1 M	-\$0.5 M
Route 128 Station HVAC Upgrades	\$0	\$0.1 M	\$0.1 M
Shaws Cove, CT Swing Bridge Fender Replacement Project	\$4.3 M	\$0.0 M	-\$4.3 M
Spring Interlocking Renewal Project	\$2.1 M	\$0.8 M	-\$1.3 M
Springfield MA Canopy Upgrades	\$0	\$0.1 M	\$0.1 M
State Street Crossing Improvement Project	\$0	\$0	\$0
Veltri Interlocking	\$1.7 M	\$1.5 M	-\$0.2 M
MBTA			
Attleboro Line Track 3 OCS Installation	\$2.6 M	\$0.1 M	-\$2.5 M
Attleboro Station Improvements	\$0	\$0.0 M	\$0.0 M
Back Bay Station: Platform Ventilation (Phase 3)	\$4.0 M	\$2.3 M	-\$1.7 M
Battery Bank Replacement Program	\$0.1 M	\$0.1 M	\$0.0 M
Boston - Providence Capacity Study & Implementation: NEC & Fairmount Line	\$3.0 M	\$1.4 M	-\$1.6 M
Boston South Station: Tower 1 and Cove Interlockings Improvements	\$13.1 M	\$2.3 M	-\$10.8 M
CWR Replacement Program	\$1.0 M	\$0.8 M	-\$0.2 M
Gas Hot Air Switch Blower Program	\$0.1 M	\$0	-\$0.1 M
Grade Crossing Replacement Program	\$1.0 M	\$0	-\$1.0 M
Hawk Hot Box / Dragging Equipment Detector Upgrade Project	\$1.4 M	\$0.8 M	-\$0.6 M
Insulated Joint Program	\$0.2 M	\$0.2 M	\$0.1 M
Insulated Joint Replacement Project	\$1.2 M	\$0	-\$1.2 M
Interlocking Crossover Replacement Program	\$2.1 M	\$0.5 M	-\$1.6 M
Interlocking Steel Replacement Program	\$0.4 M	\$0.4 M	-\$0.0 M
Joint Elimination Program	\$0.3 M	\$0.7 M	\$0.4 M

All New England investments by submitting agency (cont.)

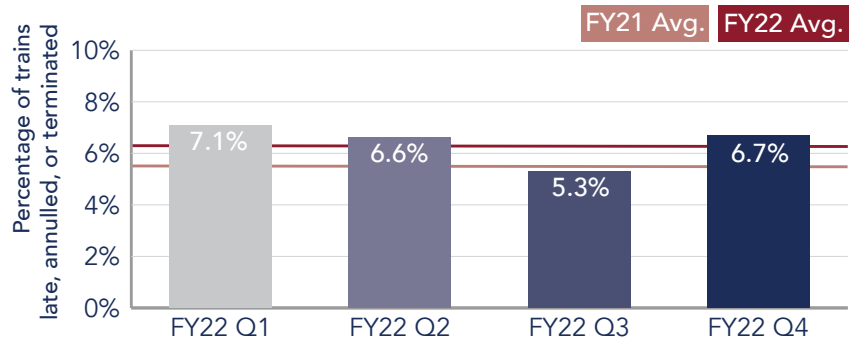
Investment Name	FY22 Planned Expenditure	FY22 Actual Expenditure	Variance
M3 Switch Machine Program	\$0.2 M	\$0.2 M	-\$0.0 M
Massachusetts Third Track: Readville to Canton	\$2.0 M	\$0.1 M	-\$1.9 M
MBTA Pawtucket Layover Facility Improvements: Phase 3	\$3.0 M	\$2.1 M	-\$0.9 M
Out Of Face Surfacing Program	\$2.3 M	\$0.2 M	-\$2.2 M
Power and Express Cable Upgrade Project	\$0.2 M	\$1.3 M	\$1.1 M
Readville Material Control Warehouse Project	\$1.0 M	\$0.0 M	-\$1.0 M
RoW Fence Upgrades Program	\$1.4 M	\$0	-\$1.4 M
Ruggles Street Station Accessibility Improvements: Phase 1	\$1.0 M	\$3.7 M	\$2.7 M
Ruggles Street Station Accessibility Improvements: Phase 2	\$0.4 M	\$2.7 M	\$2.3 M
South Attleboro Station Accessibility Improvements	\$2.0 M	\$1.9 M	-\$0.1 M
South Station Tie and Rail Replacement Project	\$2.7 M	\$0	-\$2.7 M
Southampton Street and South Bay I/L Upgrades Project	\$1.7 M	\$0.8 M	-\$0.9 M
Spot Surfacing Program	\$1.6 M	\$3.6 M	\$1.9 M
Spot Undercutting Program	\$0.3 M	\$0.1 M	-\$0.2 M
Switch Heater Cabinet / Control Program	\$0.1 M	\$0	-\$0.1 M
TAMS Upgrades Project: Various Stations	\$0.6 M	\$0.6 M	\$0.0 M
Tie/Timber Program	\$2.6 M	\$3.7 M	\$1.2 M
Tree Cutting Program	\$1.1 M	\$0	-\$1.1 M
Rhode Island DOT			
Pawtucket/Central Falls Station	\$17.8 M	\$10.6 M	-\$7.2 M
Providence Station Improvements	\$7.3 M	\$1.6 M	-\$5.7 M
Warwick/T.F. Green Airport Station Expansion	\$3.0 M	\$0.7 M	-\$2.3 M
Connecticut DOT			
Enfield Station	\$2.0 M	\$0	-\$2.0 M
Hartford Line Rail Program: Double Track (Phase 3B-Contracts 1 thru 3)	\$0	\$1.0 M	\$1.0 M
Hartford Line Station Program (Design)	\$0	\$2.9 M	\$2.9 M
North Haven Station	\$2.0 M	\$0	-\$2.0 M
Shore Line East Station Improvements	\$0	\$1.0 M	\$1.0 M
Shore Line East Track & Catenary Improvements (FY22)	\$4.0 M	\$1.6 M	-\$2.4 M
Windsor Locks Station and Interlocking Improvements	\$20.0 M	\$1.6 M	-\$18.4 M
Windsor Station Improvements	\$0	\$1.6 M	\$1.6 M

Operations: MBTA

MBTA's train service is comprised of 12 service lines, eight of which access the corridor. The Franklin, Needham, and Providence/Stoughton lines all operate on the NEC spine for a significant portion of their route. The Fairmount, Greenbush, Kingston/Plymouth, Middleborough/Lakeville, and Framingham/Worcester lines all tie into the corridor near Boston's South Station.

Train performance profile

Metric	FY21 Avg.	FY22 Avg.
Percent NEC trains late, annulled, or terminated	5.7%	6.4%
Percent NEC trains not completed	0.37%	0.52%
Avg min late per NEC train	12.8	14.2

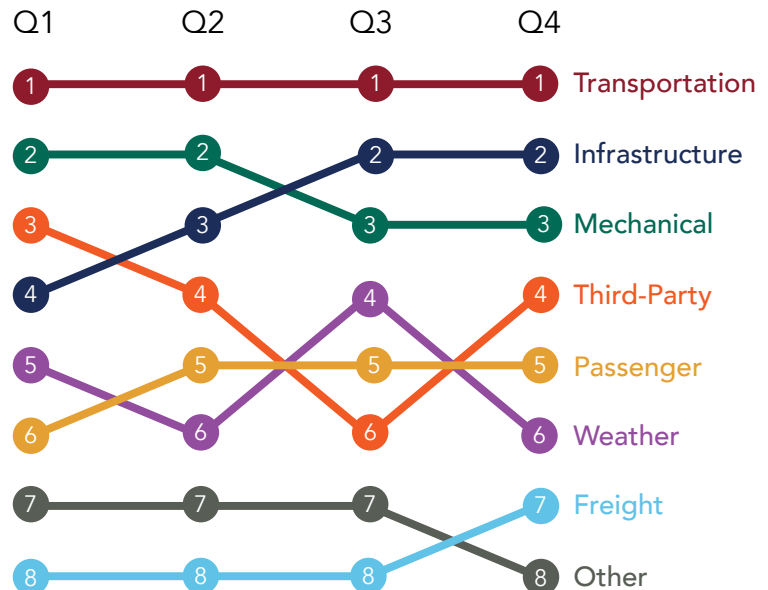


Train-delay minutes by cause

Total and percent change, FY21-22

Cause	FY21	FY22	Change
Infrastructure	15,693	21,058	+34.2%
Mechanical	22,331	32,081	+43.7%
Transportation	10,196	17,110	+67.8%
Passenger	2,832	2,920	+3.1%
Weather	5,171	13,158	+154.5%
Third-Party	5,399	6,437	+19.2%
Freight	214	264	+23.4%
Other	747	959	+28.4%
Total	62,583	93,987	+50.2%

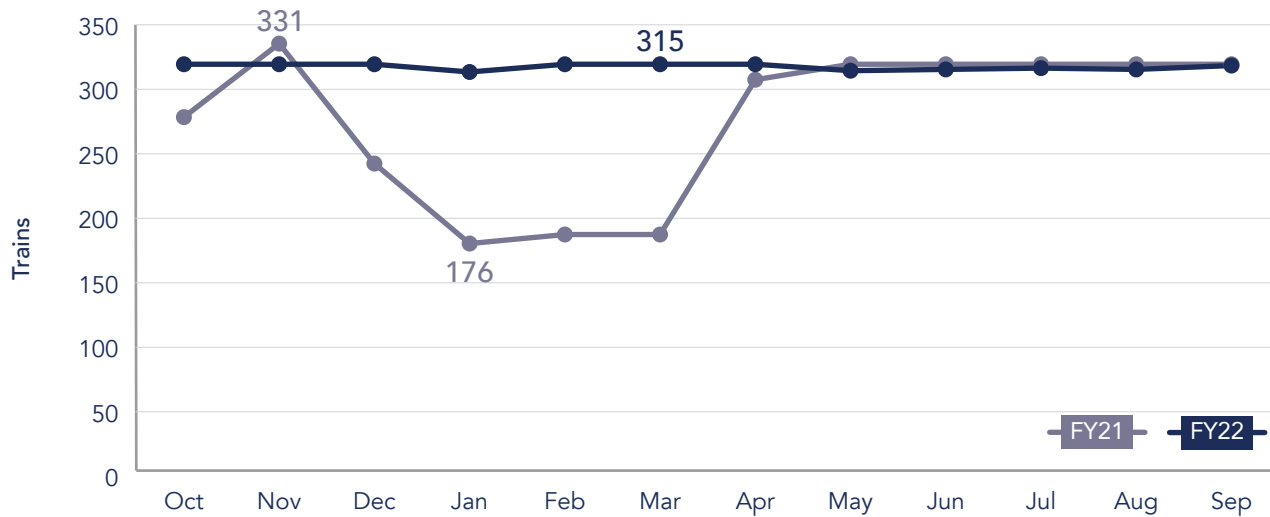
Rank by category, FY22



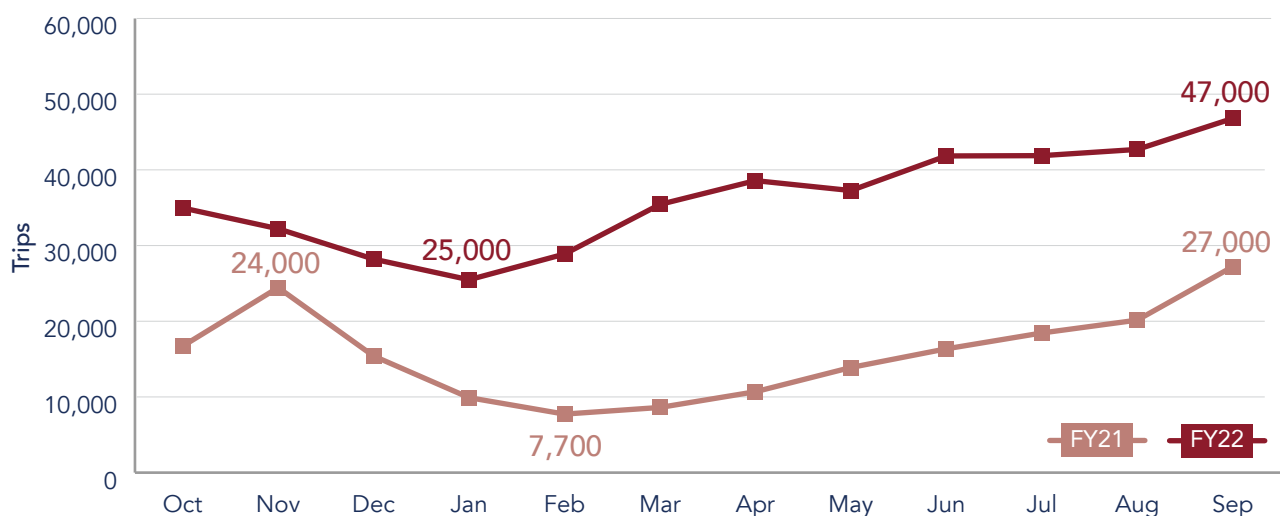
MBTA NEC Service and Ridership

Period	Average NEC weekday trains			Average NEC weekday trips		
	FY21	FY22	Change from FY21	FY21	FY22	Change from FY21
Q1 (Oct - Dec)	279	315	+13% ↑	18,854	31,798	+69% ↑
Q2 (Jan - Mar)	181	313	+73% ↑	8,749	29,930	+242% ↑
Q3 (Apr - Jun)	311	312	+0% ↑	13,644	39,227	+188% ↑
Q4 (Jul - Sep)	315	312	-1% ↓	21,935	43,790	+100% ↑
FY Average (Oct - Sep)	269	313	+17% ↑	15,798	36,186	+129% ↑

MBTA Average NEC Weekday Trains



MBTA Average NEC Weekday Trips

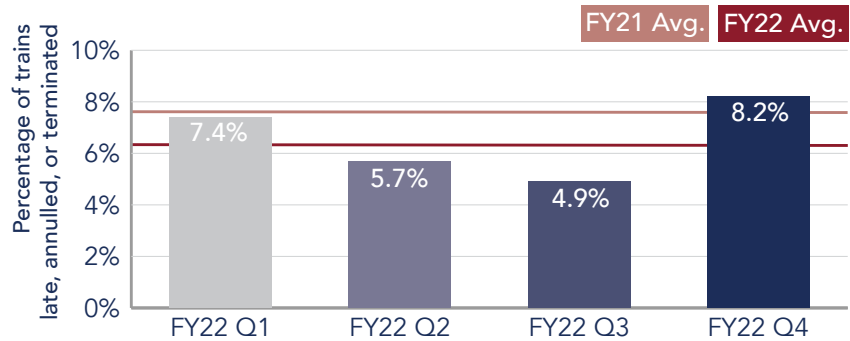


Operations: CTrail

CTrail's train service operates on two lines, both of which use the NEC. Shore Line East trains operate between New London and New Haven, CT with some extending to Stamford. Hartford Line trains operate between Hartford, CT or Springfield, MA and New Haven.

Train performance profile

Metric	FY21 Avg.	FY22 Avg.
Percent NEC trains late, annulled, or terminated	7.7%	6.5%
Percent NEC trains not completed	0.24%	0.17%
Avg min late per NEC train	17.4	15.2

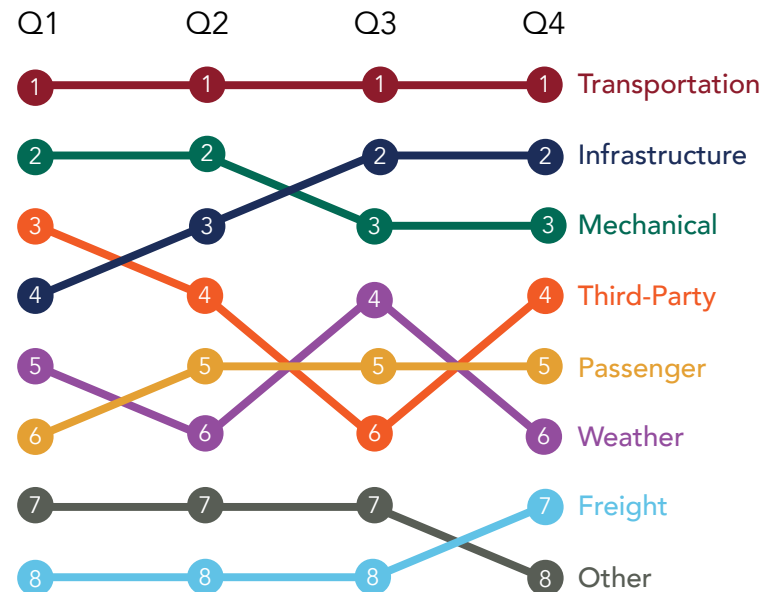


Train-delay minutes by cause

Total and percent change, FY21-22

Cause	FY21	FY22	Change
Infrastructure	2,510	2,347	-6.5%
Mechanical	3,347	2,465	-26.4%
Transportation	5,680	5,595	-1.5%
Passenger	298	416	+39.6%
Weather	522	664	+27.2%
Third-Party	1,717	1,233	-28.2%
Freight	21	27	+28.6%
Other	192	113	-41.1%
Total	14,287	12,859	-10.0%

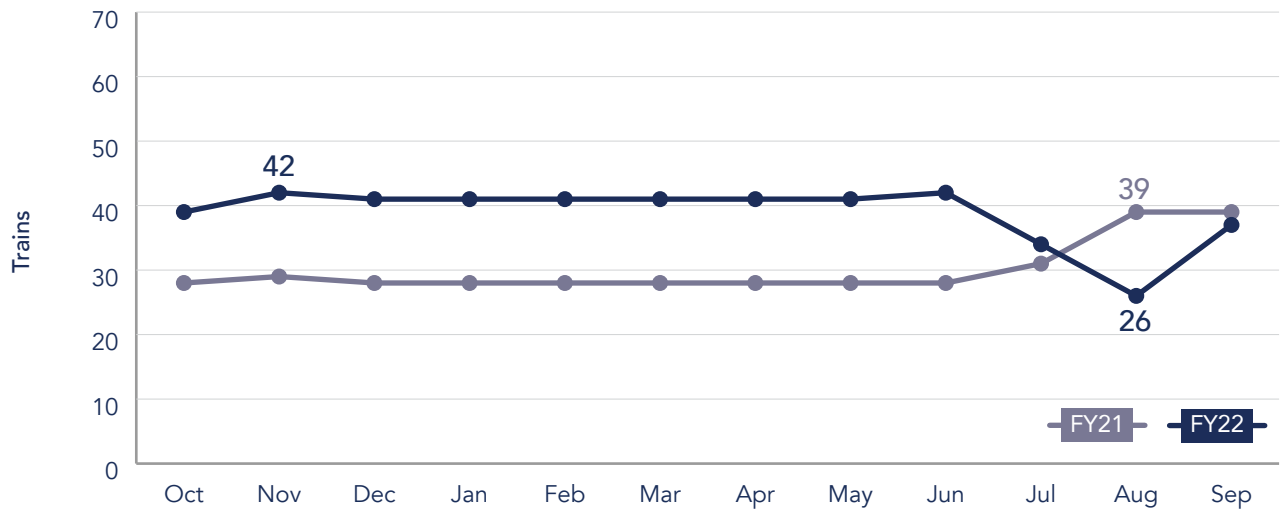
Rank by category, FY22



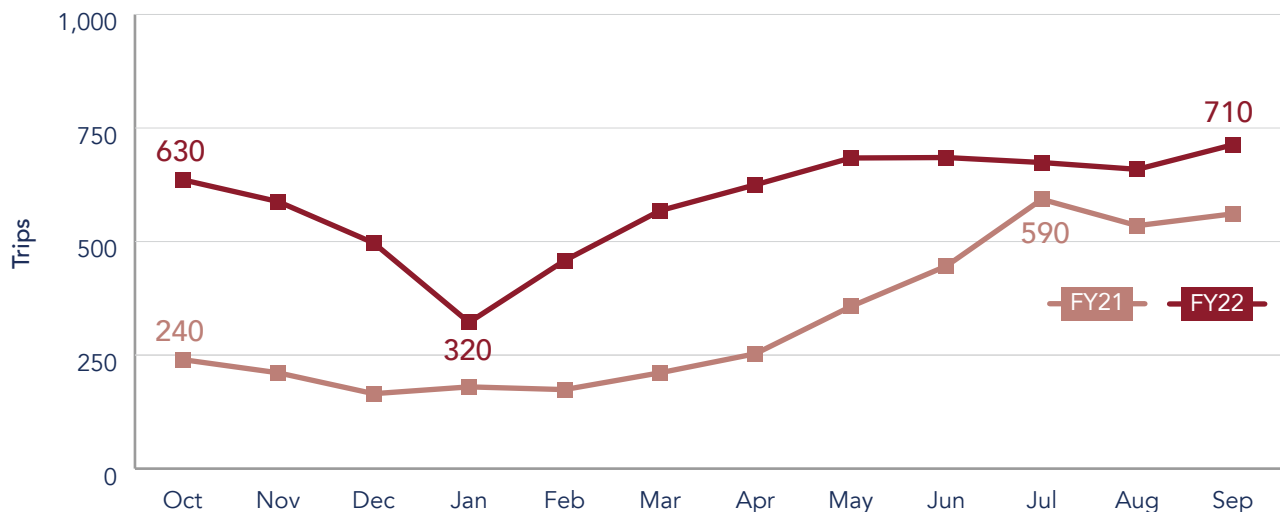
CTrail NEC Service and ridership

Period	Average NEC weekday trains			Average NEC weekday trips		
	FY21	FY22	Change from FY21	FY21	FY22	Change from FY21
Q1 (Oct - Dec)	28	41	+43% ↑	205	574	+180% ↑
Q2 (Jan - Mar)	28	41	+46% ↑	188	449	+139% ↑
Q3 (Apr - Jun)	28	41	+46% ↑	352	665	+89% ↑
Q4 (Jul - Sep)	36	32	-11% ↓	563	683	+21% ↑
FY Average (Oct - Sep)	30	39	+28% ↑	327	593	+81% ↑

CTrail Average NEC Weekday Trains



CTrail Average NEC Weekday Trips



Region: Connecticut-Westchester (NHL)

Infrastructure and Operations Detail

Operators: Amtrak, MTA Metro-North Railroad

RoW Owners: Connecticut DOT, MTA Metro-North Railroad

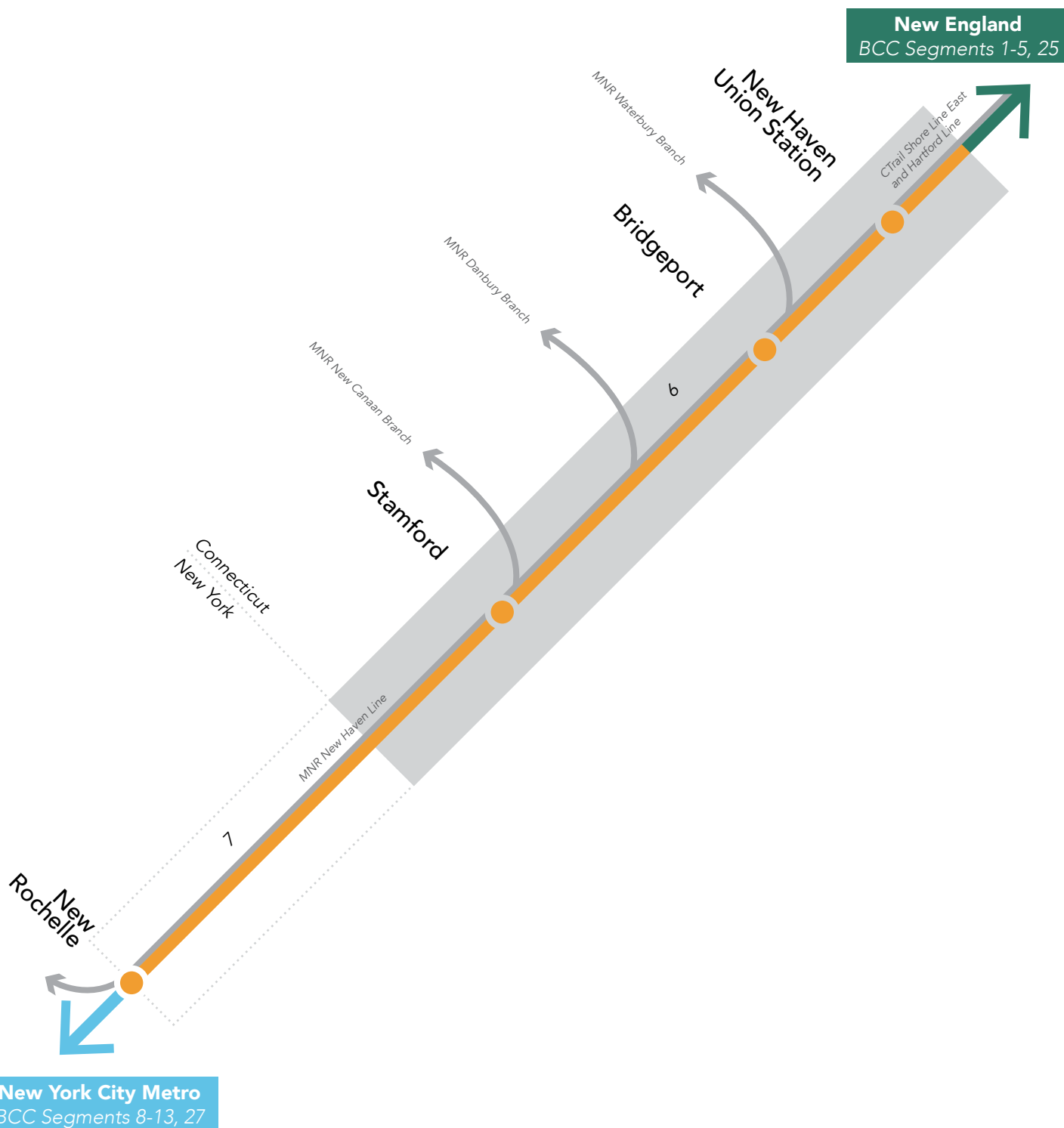
BCC Segments

6: New Haven to CT/NY State Line

7: CT/NY State Line to New Rochelle

Connecticut-Westchester (NHL)

BCC Segments 6-7



Not all intermediate stations shown.

Infrastructure

Connecticut DOT and MTA coordinate on work throughout the Connecticut-Westchester (NHL) region. In total, \$64 million was invested in FY22 (50% of plan).

10 largest investments by FY22 actual expenditure, Connecticut-Westchester (NHL)

1. Stamford Station Improvements: Parking Garage (Connecticut DOT)		
FY22 Planned Expenditure & Scope	\$20.0 M	Complete Stamford Transportation Center study
FY22 Actual Expenditure & Accomplishments	\$38.1 M	Construction progressed in FY22 with the completion of the garage floor precast erection, piers for pedestrian bridge, and re-opening of State Street to traffic. ☑ Open South State Street to traffic: Achieved after FY22
Variance & Explanation	\$18.1 M	Work progressed at a faster rate.
2. Walk Bridge: Replacement (Connecticut DOT)		
FY22 Planned Expenditure & Scope	\$222.0 M	Start Construction
FY22 Actual Expenditure & Accomplishments	\$30.3 M	Project received Connecticut Department of Energy and Environmental Protection (CTDEEP) permits and continued advancing through US Coast Guard (USCG) and US Army Corps of Engineers (USACE) permitting process. Work continued on construction bid packaging strategy for FY23. ➡ Complete interlocking construction: <i>Now estimated Nov 2023</i> ➡ Begin demolition of south half of bridge: <i>Now estimated Dec 2025</i>
Variance & Explanation	-\$191.7 M	Project did not begin construction due to delayed environmental permitting process. Several enabling activities were able to continue under a separate project.
3. New Haven Line Yard and Facility Program (Connecticut DOT)		
FY22 Planned Expenditure & Scope	\$10.0 M	Complete 60% design for Wheel Mill Shop and Car and Diesel Shop
FY22 Actual Expenditure & Accomplishments	\$30.0 M	Substantial completion of the East End Connector (EEC) element was achieved. Rail and catenary work continued on the West End Yard (WEY) element. Catenary cassion and high mast foundation installations were completed for both projects in FY22. ☑ East End Connector Construction Complete: Achieved after FY22 ➡ West End Yard Construction Complete: <i>Now estimated Dec 2022</i> ➡ Wheel Mill Rehab Design Complete: <i>Now estimated Dec 2023</i> ➡ Car and Diesel Design Complete: <i>Now estimated Nov 2024</i>
Variance & Explanation	\$20.0 M	Work had to be coordinated within Metro-North track and power outage scheduling constraints.

Investment detail including expenditures, accomplishments, and explanation of variances are published as submitted by agencies.

10 largest investments by FY22 actual expenditure, Connecticut-Westchester (NHL) (cont.)

4. Track (C) Program (Connecticut DOT)		
FY22 Planned Expenditure & Scope	\$19.0 M	C-32: Cyclical capital track maintenance; C-33: Begin construction activities
FY22 Actual Expenditure & Accomplishments	\$27.3 M	<ul style="list-style-type: none"> • CP 234 Rehabilitation The following switches were completed: #8L1, #L242, #3230E, #3032W (with tie panel), #4344 (with tie panel) and #L228. • Tie Installation Rail tie installation was completed at the following locations: <ul style="list-style-type: none"> • 5,138 ties on Track 2 between CP234 and CP240 • 1,577 ties on Track 4 between CP248 and CP255 • 2,215 ties on Tracks 6, 8, 12, 14, and 20 at Bridgeport Yard • 5,120 ties on Track 3 between CP235 and CP240 • 4,224 ties on Track 1 between CP229 and CP233 • 4,157 ties on Track 2 between CP229 and CP233 • Surfacing 134,540 ft of surfacing with tie installation including ballast and tempered, regulated, and stabilized track. 10.3 miles of out-of-face (OOF) surfacing completed on Tracks 1 and 4 between CP261 and CP271. • Rail Installation 35,200 ft of rail installed on Track 4 between CP248 and CP255. • Rail, switch, and other track material (OTM) procurement on going. Agreement negotiation with construction, engineering, and inspection (CE&I) consultant AECOM.
Variance & Explanation	\$8.3 M	Due to Resource and track availability CP 234 Switch rehabilitation not completed. Scheduled to complete prior to September 2023.
5. Signal System Replacement Program (Connecticut DOT)		
FY22 Planned Expenditure & Scope	\$15.5 M	Segment 2: continue construction; Segment 3: pre-construction activities
FY22 Actual Expenditure & Accomplishments	\$17.0 M	Contractor (Verde) continues to perform work in the Stamford CP-234 area during available work windows. Track outages in the area compete with other projects and yard operations. Design consultant agreement still continues to be processed by the MTA.
Variance & Explanation	\$1.5 M	No variances from current quarter/schedule. Contract processing issues continue to delay the design consultant, Gannett Fleming, from performing design work authorized for the project.
6. Undergrade Bridge Rehabilitation Program (MTA)		
FY22 Planned Expenditure & Scope	\$13.0 M	Continued construction of bridges spans. Between CP 223 and CP 229, continuous outages will be utilized on Track 3 between October 2021 and May 2022, with support on Track 1 in off-peak periods and weekends. Outage will migrate to Track 1 for the remainder of FY22. Operations in this segment assume 3 track operation, and existing train schedules assume outages of this type in this segment, allowing for normal operations.
FY22 Actual Expenditure & Accomplishments	\$10.5 M	Willet Av and Highland St bridges are completed, returned to full service, and have completed all punch list items, including masonry abutments and structural painting.
Variance & Explanation	-\$2.5 M	Project closeout is currently not complete, anticipated for December 2022.
7. Atlantic Street Bridge Project (Connecticut DOT)		
FY22 Planned Expenditure & Scope	\$15.0 M	Finish remaining track work for Atlantic Street, advertise track and catenary modification work.
FY22 Actual Expenditure & Accomplishments	\$10.2 M	Work progressed on the new platform, work also continued on catenary upgrades. Ongoing coordination between the contractor and CTDOT to resolve discrepancies in workplans.
Variance & Explanation	-\$4.8 M	Not available

Investment detail including expenditures, accomplishments, and explanation of variances are published as submitted by agencies.

10 largest investments by FY22 actual expenditure, Connecticut-Westchester (NHL) (cont.)

8. Positive Train Control Program (Connecticut DOT)		
FY22 Planned Expenditure & Scope	\$12.0 M	Complete software revisions and final fiber optic tie in
FY22 Actual Expenditure & Accomplishments	\$7.6 M	Transponder, Communication, and WIU design and implementation are complete and on schedule. Office systems are near completion.
Variance & Explanation	-\$4.4 M	NEC-wide known issues for the PTC Onboard system continue to be diagnosed.
9. Walk Bridge: Enabling Components (CP243, Danbury Dockyard, East Catenary) (Connecticut DOT)		
FY22 Planned Expenditure & Scope	\$0	Not in FY22-26 CIP
FY22 Actual Expenditure & Accomplishments	\$7.0 M	Construction was completed on the CP243 and Danbury Dock Yard project elements. Procurement has started on the East Catenary Breakout project element.
Variance & Explanation	\$7.0 M	Project elements were broken out from original Walk Bridge project in FY22 plan.
10. Stamford Station Improvements: Elevators and Escalators Improvements (Connecticut DOT)		
FY22 Planned Expenditure & Scope	\$5.0 M	Begin construction activities
FY22 Actual Expenditure & Accomplishments	\$5.9 M	Elevator and Escalator surveys were completed. The designs have been revised based on project comments.
Variance & Explanation	\$0.9 M	Material delays have required resequencing work. Additional design revisions were required.

Investment detail including expenditures, accomplishments, and explanation of variances are published as submitted by agencies.

All Connecticut-Westchester (NHL) investments by submitting agency

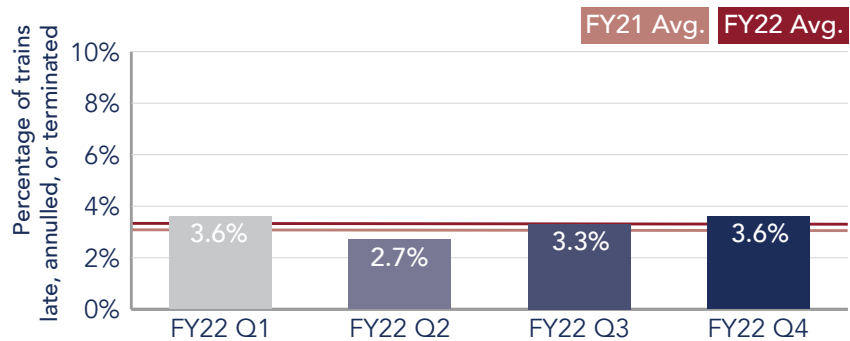
Investment Name	FY22 Planned Expenditure	FY22 Actual Expenditure	Variance
Connecticut DOT			
Atlantic Street Bridge Project	\$15.0 M	\$10.2 M	-\$4.8 M
Auto-Tension Catenary Replacement Project: Segments C1A, C2	\$4.0 M	\$1.6 M	-\$2.4 M
Bridge Design Program	\$2.5 M	\$1.8 M	-\$0.7 M
Bridge Replacement/Repair Program	\$0	\$1.1 M	\$1.1 M
Cos Cob Bridge Interim Repairs	\$8.0 M	\$0.5 M	-\$7.5 M
Devon Bridge Replacement	\$0.5 M	\$0.4 M	-\$0.1 M
Network Infrastructure Upgrade Project	\$10.0 M	\$5.4 M	-\$4.6 M
New Haven Line Station Platform Replacement Program (Darien)	\$20.0 M	\$1.0 M	-\$19.0 M
New Haven Line Station Platform Replacement Program (New Haven)	\$0	\$0.0 M	\$0.0 M
New Haven Line Yard and Facility Program	\$10.0 M	\$30.0 M	\$20.0 M
New Haven Union Station Improvements	\$1.0 M	\$0	-\$1.0 M
Positive Train Control Program	\$12.0 M	\$7.6 M	-\$4.4 M
Power Improvement Program	\$1.0 M	\$0.1 M	-\$0.9 M
Saugatuck River Bridge Interim Repairs	\$0	\$1.4 M	\$1.4 M
Saugatuck River Bridge Replacement	\$0.2 M	\$0	-\$0.2 M
Signal System Replacement Program	\$15.5 M	\$17.0 M	\$1.5 M
Stamford Station Improvements: Elevators and Escalators Improvements	\$5.0 M	\$5.9 M	\$0.9 M
Stamford Station Improvements: Parking Garage	\$20.0 M	\$38.1 M	\$18.1 M
Structures (S) Program	\$2.0 M	\$1.4 M	-\$0.6 M
Substation Repairs/Improvements	\$4.0 M	\$0.3 M	-\$3.7 M
TIME-Phase 1 (CP257 to 261)	\$15.0 M	\$0.4 M	-\$14.6 M
TIME-Phase 2 (Walk Bridge, Minor Bridge Replacements)(CP 241 to 243)	\$10.0 M	\$2.5 M	-\$7.5 M
TIME-Phase 5 (New CP227-228 Interlocking, CP223-229 Block Improvements)	\$0	\$0	\$0
Track (C) Program	\$19.0 M	\$27.3 M	\$8.3 M
Walk Bridge: Enabling Components (Advanced Utilities)	\$0	\$1.8 M	\$1.8 M
Walk Bridge: Enabling Components (CP243, Danbury Dockyard, East Catenary)	\$0	\$7.0 M	\$7.0 M
Walk Bridge: Replacement	\$222.0 M	\$30.3 M	-\$191.7 M
MTA			
Bridge 23	\$0	\$0.2 M	\$0.2 M
Comms & Signal Program	\$0.5 M	\$0	-\$0.5 M
Overhead Bridge Rehabilitation Program	\$0.5 M	\$0.5 M	-\$0.0 M
Retaining Wall Reconstruction	\$0.8 M	\$0.9 M	\$0.1 M
Structures Program	\$0.1 M	\$0.6 M	\$0.5 M
Substation 128 and 178 Replacement	\$6.5 M	\$0.3 M	-\$6.2 M
Systemwide Support Programs	\$0.5 M	\$0.1 M	-\$0.4 M
Track Programs	\$2.3 M	\$3.0 M	\$0.8 M
Undergrade Bridge Rehabilitation Program	\$13.0 M	\$10.5 M	-\$2.5 M

Operations: MTA Metro-North Railroad

MTA Metro-North Railroad (Metro-North) operates on the NEC Main Line, south from New Haven, CT into New York through New Rochelle, NY where trains leave the corridor to proceed to Grand Central Station. Branch lines from New Canaan, Danbury, and Waterbury connect with the New Haven Line at Stamford, South Norwalk, and Devon. Metro-North service outside of the state of New York is operated on behalf of Connecticut DOT.

Train performance profile

Metric	FY21	FY22
Percent NEC trains late, annulled, or terminated	3.0%	3.3%
Percent NEC trains not completed	0.24%	0.20%
Avg min late per NEC train	17.0	18.3

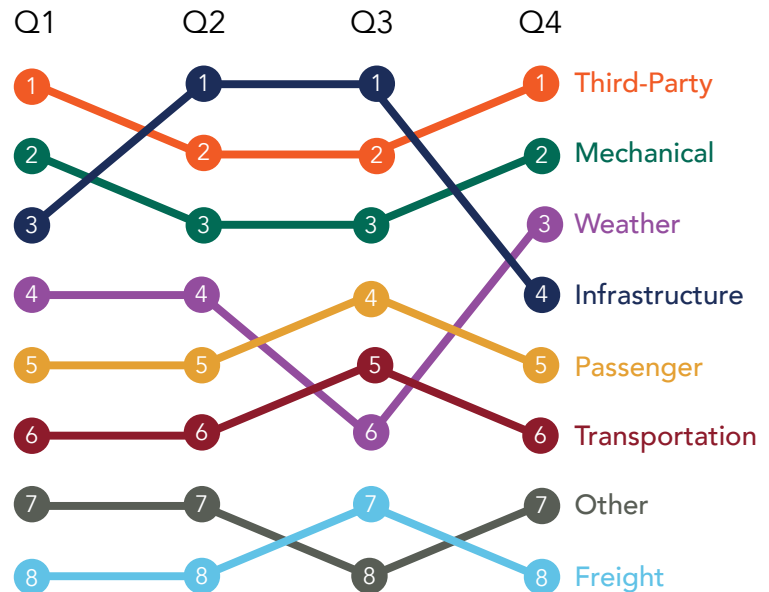


Train-delay minutes by cause

Total and percent change, FY21-22

Cause	FY21	FY22	Change
Infrastructure	6,535	10,682	+63.5%
Mechanical	7,500	9,497	+26.6%
Transportation	1,204	1,862	+54.7%
Passenger	1,787	2,901	+62.3%
Weather	3,996	5,341	+33.7%
Third-Party	3,710	13,099	+253.1%
Freight	3	6	+100.0%
Other	60	745	+1,141.7%
Total	24,795	44,133	+78.0%

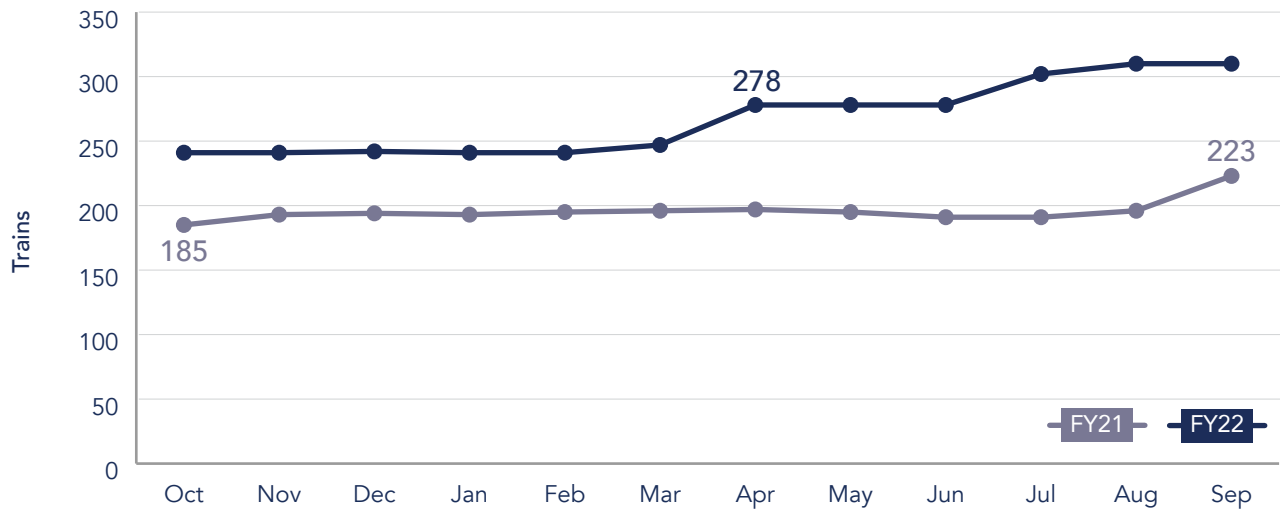
Rank by category, FY21



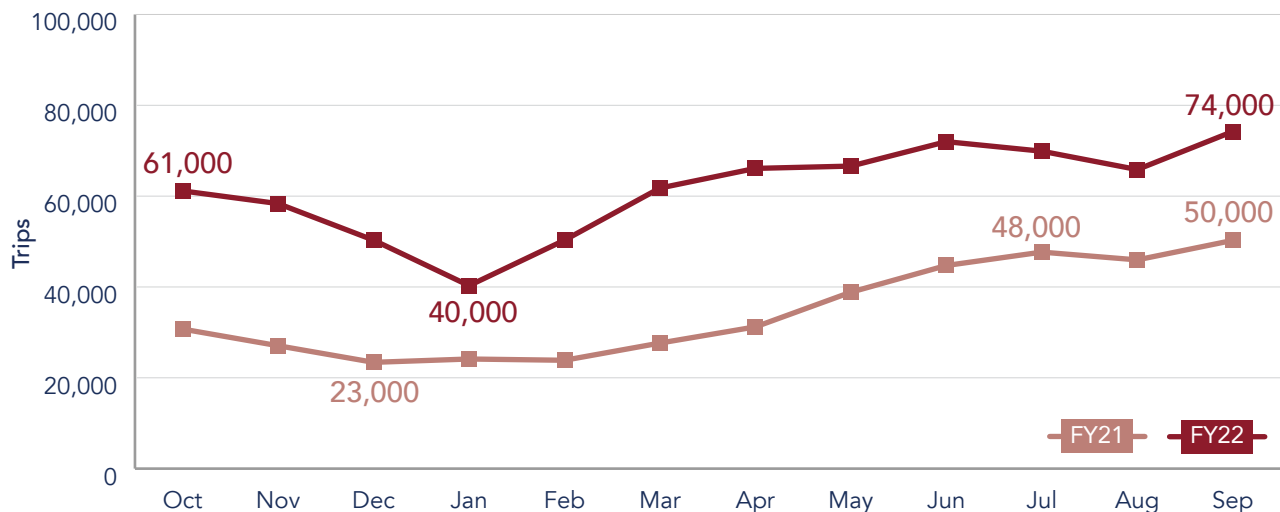
MTA Metro-North NEC Service and ridership

Period	Average Weekday NEC Trains			Average Weekday NEC Trips		
	FY21	FY22	Change from FY21	FY21	FY22	Change from FY21
Q1 (Oct - Dec)	191	241	+27% ↑	27,062	56,603	+109% ↑
Q2 (Jan - Mar)	195	243	+25% ↑	25,215	50,790	+101% ↑
Q3 (Apr - Jun)	194	278	+43% ↑	38,264	68,239	+78% ↑
Q4 (Jul - Sep)	203	307	+51% ↑	47,963	69,989	+46% ↑
FY Average (Oct - Sep)	196	267	+37% ↑	34,626	61,405	+77% ↑

MTA Metro-North Average NEC Weekday Trains



MTA Metro-North Average NEC Weekday Trips



Region: New York City Metro

Infrastructure and Operations Detail

Operators: Amtrak, MTA Long Island Rail Road, NJ TRANSIT, SEPTA

RoW Owners: Amtrak

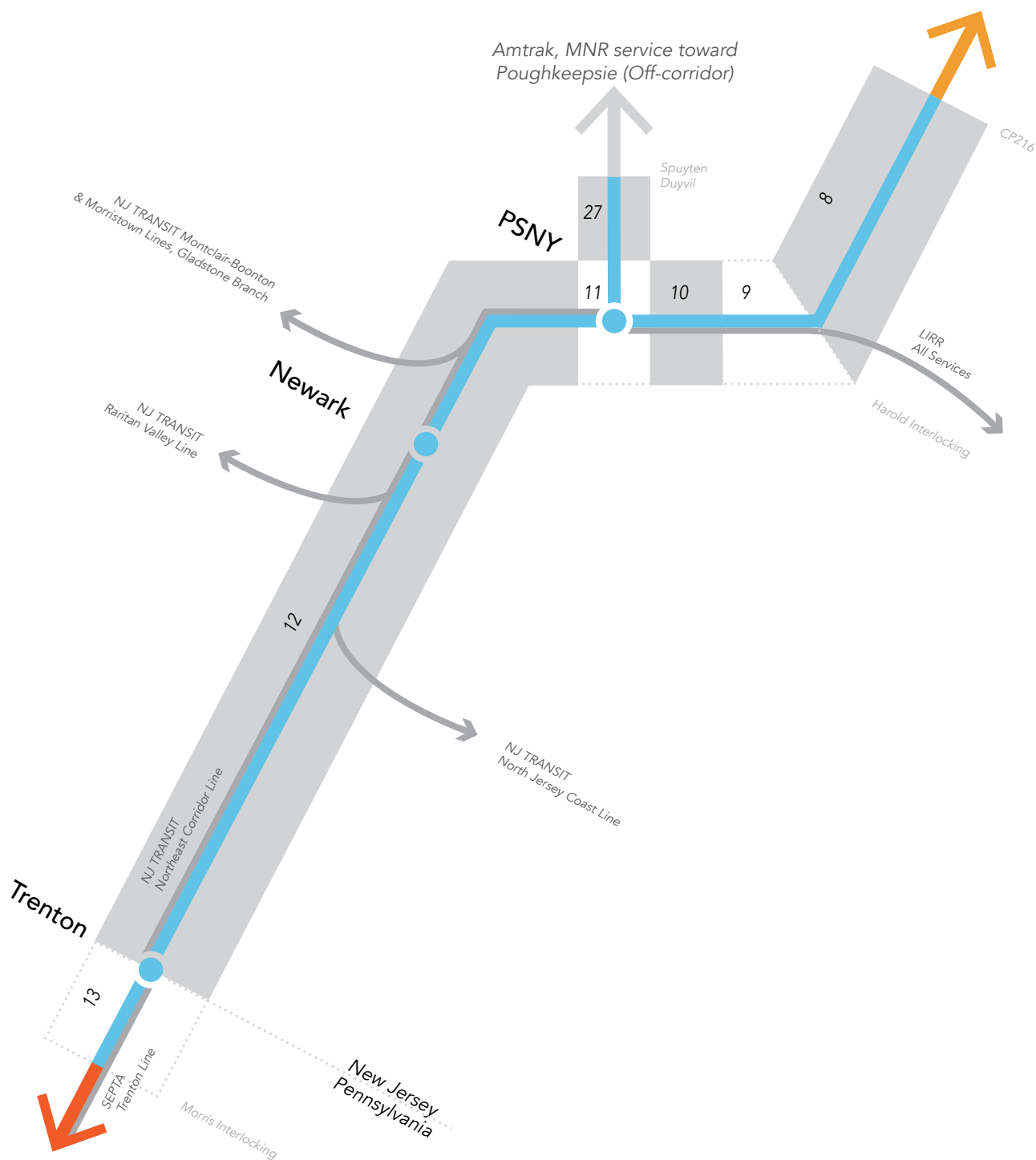
BCC Segments

- 8: New Rochelle to Harold
- 9: Harold to F Interlocking
- 10: F Interlocking to Penn Station New York
- 11: Penn Terminal
- 12: Penn Station New York to Trenton
- 13: Trenton to Morris
- 27: Spuyten Duyvil to Penn Station New York

New York City Metro

BCC Segments 8-13, 27

**Connecticut -
Westchester (NHL)**
BCC Segments 6-7



Mid-Atlantic North
BCC Segments 14-20, 28-30

Not all intermediate stations shown.

Infrastructure

Amtrak, MTA, and NJ TRANSIT coordinate on work throughout the New York City Metro region. In total, \$272 million was invested in FY22 (83% of plan).

10 largest investments by FY22 actual expenditure, New York City Metro

1. Penn Station Access (MTA)		
FY22 Planned Expenditure & Scope	\$400.0 M	Commence design/build work
FY22 Actual Expenditure & Accomplishments	\$313.1 M	Completed NEPA review. Awarded Design-Build contract. Design & geotechnical work underway. <input checked="" type="checkbox"/> Execute Design/Build Agreement with Amtrak: Achieved Dec 2021 <input checked="" type="checkbox"/> Issue Notice to Proceed for Design/Build Contract: Achieved Dec 2021 <input checked="" type="checkbox"/> Initiate Final Design: Achieved Jan 2022 <input checked="" type="checkbox"/> Complete manufacturing of Leggett crossovers: Achieved Aug 2022 <input checked="" type="checkbox"/> Obtain USACE Wetlands Permit: <i>Now estimated Nov 2022</i>
Variance & Explanation	-\$86.9 M	The project experienced delays in both design support and construction activities due to a lack of Amtrak Force Account and Track Outages in Q3/Q4
2. New York Penn Station LIRR Concourse (MTA)		
FY22 Planned Expenditure & Scope	\$250.0 M	Continue construction of the LIRR Concourse Project
FY22 Actual Expenditure & Accomplishments	\$222.9 M	The widened LIRR Concourse was opened to the public in September 2022. <input checked="" type="checkbox"/> New boiler plant for LIRR leased space: Achieved Dec 2021
Variance & Explanation	-\$27.1 M	Invoices in the system are pending payment.
3. Gateway: Portal North Bridge (NJ TRANSIT)		
FY22 Planned Expenditure & Scope	\$150.0 M	Contractor will begin to mobilize on-site; start preparing shop drawings for review and approval; begin utility relocation work; begin retaining wall and some foundation work
FY22 Actual Expenditure & Accomplishments	\$178.3 M	Contractor completed mobilization. Shop drawings are in progress. Construction work is in progress throughout the project site, including borings, access roads, utility relocations, retaining walls, construction access platforms, catenary structures and finger piers.
Variance & Explanation	\$28.3 M	Project is expected to meet major milestones. Original estimate may have been conservative, however further investigation can provide additional details.
4. Harold Interlocking (MTA)		
FY22 Planned Expenditure & Scope	\$164.0 M	Reach near substantial completion of Harold Catenary Contract, achieve outage and construction of EBRR cut/cover, and initiate westbound bypass procurement.
FY22 Actual Expenditure & Accomplishments	\$130.5 M	Loop 1 track from F to Loop Interlocking completed, including Loop 1A DNA track and 3rd rail work. Extended outage needed for Loop 2 began January 17, 2022. Work completed and track placed in service. Installed catenary sectionalizing switch RL44E and put into service by Amtrak. Long Term Outage for Eastbound Reroute approved and construction commenced. For the EBRR, completed hand-dug pits for button piers under Honeywell bridge. Excavated approximately 10,400 cy of 32,000 cy of soil (32.5% complete). <input checked="" type="checkbox"/> Initiate Westbound Bypass Procurement: <i>Now estimated Jul 2023</i> <input checked="" type="checkbox"/> Near Substantial Completion of Harold Catenary Contract: <i>Now estimated Jul 2023</i> <input checked="" type="checkbox"/> Achieve outage and construction of EBRR Cut/Cover: <i>Now estimated Apr 2024</i>
Variance & Explanation	-\$33.5 M	Amtrak resources continue to be lower than planned levels needed to maintain schedules, resulting in delays.

Investment detail including expenditures, accomplishments, and explanation of variances are published as submitted by agencies.

10 largest investments by FY22 actual expenditure, New York City Metro (cont.)

5. New York Track Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$30.3 M	Establish and maintain a State of Good Repair (SOGR), efficient and safe operation for track assets to maintain compliance with current regulations and standards. FY22 scope includes the track improvements in regards to surfacing, insulated joint replacements, joint eliminations, interlocking steel replacements, spot rail replacements, timber/concrete ties replacement, drainage upgrades, and ballast replacement across New York Division
FY22 Actual Expenditure & Accomplishments	\$45.5 M	Completed renewal of track assets inclusive of the following: mudspot remediation, concrete/wood ties & timbers, spot rail replacement, along with improvements to 89/91 SW, Line 1 track panel and Track 12 body track rehab.
Variance & Explanation	\$15.2 M	Overspend due to additional scope items to maintain SOGR and escalation/inflation as related to material and labor costs.
6. Penn Station NY - Infrastructure Renewal (Amtrak)		
FY22 Planned Expenditure & Scope	\$38.3 M	Replacement of Track 13 and Track 5 body tracks. Replacement of 123/127, 105/119, 121/125, 125/129, 129/133, and 81/91 slip switches. Replacement of 553, 77, 79, 91, 75, 17W, and 15W turnouts.
FY22 Actual Expenditure & Accomplishments	\$40.6 M	Completed replacement switches, track assets and corresponding systems which included: Block tie replacement of Track 5, Block tie replacement of Track 13, Replacement of five (5) slip switches, and Replacement of seven (7) turnouts within Penn Station New York Terminal.
Variance & Explanation	\$2.3 M	Overspend as a result of escalation/inflation related impacts on costs of material and labor.
7. Gateway: Hudson Tunnel Project (Amtrak)		
FY22 Planned Expenditure & Scope	\$20.4 M	Manhattan and New Jersey property acquisition, Contract packaging and pre-procurement, Complete Hudson Yards Concrete Casing Section 3 Early Work
FY22 Actual Expenditure & Accomplishments	\$28.5 M	HYCC-3 Early work continued progress. Green Acres Scoping Hearing completed and funding agreement established with NJT. <input checked="" type="checkbox"/> Completion of Supplemental Geotechnical Borings: Achieved Jan 2022 <input checked="" type="checkbox"/> Scoping hearing for Green Acres: Achieved Jun 2022 <input checked="" type="checkbox"/> Payment to NYC for 11th Avenue Revocable Consent: Achieved Jul 2022 <input checked="" type="checkbox"/> HYCC-3 Early Work: Splicing, Testing, Commissioning: Achieved Aug 2022 <input checked="" type="checkbox"/> Payment to NJT re: Green Acres and other parcels: Achieved Sep 2022 <input checked="" type="checkbox"/> Payment to Wetland Mitigation Credits: Achieved after FY22 <input checked="" type="checkbox"/> Entry into FTA CIG Engineering Phase: <i>Now estimated in Nov 2022</i> <input checked="" type="checkbox"/> HYCC-3 Early Work: Substantial Completion: <i>Now estimated in Nov 2022</i> <input checked="" type="checkbox"/> HYCC-3 Early Work: Final Completion: <i>Now estimated in Dec 2022</i> <input checked="" type="checkbox"/> Start of Lease Payments Block 675 Lot 12: <i>Now estimated in Apr 2023</i>
Variance & Explanation	\$8.1 M	The FY22 variance of \$8M is due to overage of costs associated with delays in completion of Hudson Yards concrete casing early work emergency service building relocation phase.
8. Clark to Ham Constant Tension Upgrade Project (Amtrak)		
FY22 Planned Expenditure & Scope	\$22.3 M	Complete remaining 93 foundations at Track 4 and 13 foundations at Track 1, remove temporary platforms at Hamilton and Princeton Junction, received the balance of steel such as the 92 lower & 96 upper columns, and 155 portal Beams. Complete installation of lower columns catenary and approximately 36 portal beams
FY22 Actual Expenditure & Accomplishments	\$19.4 M	<ul style="list-style-type: none"> Completed all 150 Foundations installation at Track 1. Completed 142 out of 155 Foundations at Track 4. Erected 81 out of 99 Lower poles and 41 out of 59 Shorts at Track 1. Erected 54 out of 99 Lower poles and 34 out of 59 shorts at Track 4. Received Column Poles (197 out of 198 Lower, 198 out of 198 Upper, 115 out of 118 & Shorts) Received 48 out of 160 Portal Beams.
Variance & Explanation	-\$3.0 M	Due to access road restriction, the remaining Thirteen (13) foundations at Track 4 were put on hold and redesigned and shifted. The proposed shifted foundations are required NJDEP G-21 Permit due to near the adjacent wetlands. 10 Portal Beams erection has been pushed to FY23 due to shortage of ET resources to erect these Portal Beams.

Investment detail including expenditures, accomplishments, and explanation of variances are published as submitted by agencies.

10 largest investments by FY22 actual expenditure, New York City Metro (cont.)

9. Next Generation Acela Infrastructure Upgrades: Sunnyside Yard (Amtrak)		
FY22 Planned Expenditure & Scope	\$69.9 M	Continue construction of Ready Tracks (Package 'A' & 'B'), complete design for Ready Tracks Package 'C' and begin construction of Package 'C'.
FY22 Actual Expenditure & Accomplishments	\$17.8 M	Excavation of soils and other construction materials related to demo. <input checked="" type="checkbox"/> Contractor mobilization for Ready Tracks Package 'A' & 'B': Achieved Nov 2021 🕒 Begin demolition of Honeywell Street vehicular ramp: <i>Now estimated in Dec 2022</i> 🕒 Complete Ready Tracks Package 'C' Final Design: <i>Now estimated in Apr 2023</i>
Variance & Explanation	-\$52.0 M	Force account availability issues in this region have delayed the delivery of the work.
10. Empire Line Lighting Upgrade Project (Amtrak)		
FY22 Planned Expenditure & Scope	\$15.7 M	FY22 scope includes the Issue a Notice to Proceed to the Contractor in October 2021. The Contractor is to install a new and energy-efficient LED lighting system with an emergency lighting inverter distribution in the Empire Line Overbuild between 72nd to 125th Street under Riverside Park, NY. The work will include rehabilitating four electrical rooms by upgrading the switchgear bus bars and performing structural repairs to the walls. In addition to this work, we are planning to replace four egress stairs.
FY22 Actual Expenditure & Accomplishments	\$12.3 M	The project is progressing as anticipated since March 2022. The scope is currently 51% completed. An ECR was submitted in February to correct the discrepancies between AIMS and the PMO LOP. The LOP of the project is \$29,017,276.
Variance & Explanation	-\$3.5 M	The project presented an ECR on April 5, 2022 to reduce the FY22 AOP due to a late award of the contract.

Investment detail including expenditures, accomplishments, and explanation of variances are published as submitted by agencies.

All New York City Metro investments by submitting agency

Investment Name	FY22 Planned Expenditure	FY22 Actual Expenditure	Variance
Amtrak			
1st Avenue Ventilation Fan Attenuator Upgrade	\$0.5 M	\$0.5 M	-\$0.0 M
Clark to Ham Constant Tension Upgrade Project	\$22.3 M	\$19.4 M	-\$3.0 M
East River Tunnel Rehabilitation Project	\$6.7 M	\$7.0 M	\$0.4 M
East River Tunnels Track Replacement	\$0.3 M	\$0.4 M	\$0.2 M
Empire Line Lighting Upgrade Project	\$15.7 M	\$12.3 M	-\$3.5 M
Fair Interlocking Renewal Project	\$1.2 M	\$0.2 M	-\$0.9 M
FDNY Tunnel Radio System Upgrades	\$0.3 M	\$0.3 M	\$0.0 M
Gateway: Harrison Fourth Track	\$1.4 M	\$0.9 M	-\$0.5 M
Gateway: Highline Renewal and State of Good Repair: Dock Bridge	\$1.0 M	\$0.2 M	-\$0.9 M
Gateway: Hudson Tunnel Project	\$20.4 M	\$28.5 M	\$8.1 M
Gateway: New York Penn Station Expansion	\$18.0 M	\$6.8 M	-\$11.2 M
Gateway: Sawtooth Bridges Replacement	\$12.9 M	\$0.7 M	-\$12.2 M
Ham Interlocking Renewal Project	\$6.4 M	\$4.9 M	-\$1.4 M
Hellgate Substation 45-47 Upgrade Project	\$1.1 M	\$1.7 M	\$0.6 M
Intercity Trainset (ICT) Maintenance Facilities: Sunnyside Yard	\$0	\$1.1 M	\$1.1 M
Kearny Sub 41 Relocation Design and Construction	\$3.3 M	\$1.1 M	-\$2.2 M
Kearny to Waverly Transmission Tower Upgrade Project	\$4.7 M	\$0.8 M	-\$3.8 M
Moynihan Train Hall: Phase 2	\$0	-\$2.7 M	-\$2.7 M
New Brunswick Commuter Yard Remediation	\$1.2 M	\$0.0 M	-\$1.2 M
New Hackensack Substation 42 Control House Project	\$5.8 M	\$0.9 M	-\$4.9 M
New York Catenary Program	\$1.4 M	\$2.2 M	\$0.8 M
New York Facilities Program	\$1.8 M	\$2.8 M	\$0.9 M
New York Penn Station Crew Base Renovations	\$1.3 M	\$0.1 M	-\$1.1 M
New York Penn Station Escalator Replacement	\$3.4 M	\$0.3 M	-\$3.1 M
New York Penn Station Refresh Program	\$2.5 M	\$0.7 M	-\$1.8 M
New York Penn Station Track Remediation	\$3.2 M	\$2.5 M	-\$0.7 M
New York Signals Program	\$3.5 M	\$3.4 M	-\$0.1 M
New York Structures Program	\$6.4 M	\$11.2 M	\$4.8 M
New York Substations Program	\$7.7 M	\$4.4 M	-\$3.3 M
New York Track Program	\$30.3 M	\$45.5 M	\$15.2 M
Newark Penn Station PCB Remediation	\$0.4 M	\$0	-\$0.4 M
Newark Penn Station: Platform Rehabilitation (A, B, C)	\$0.7 M	\$0.0 M	-\$0.7 M
Next Generation Acela Infrastructure Upgrades: Sunnyside Yard	\$69.9 M	\$17.8 M	-\$52.0 M
NY Portfolio Planning & Development	\$0	\$1.8 M	\$1.8 M
NYP 7th and 32nd Entrance Renovation	\$0	\$6.5 M	\$6.5 M
NYP Departure Concourse Renovation	\$1.8 M	\$0.0 M	-\$1.8 M

All New York City Metro investments by submitting agency (cont.)

Investment Name	FY22 Planned Expenditure	FY22 Actual Expenditure	Variance
NYP Elevator C2 & P4 Modernization	\$2.2 M	\$1.0 M	-\$1.1 M
NYP North Concourse & Retail Renovation	\$3.0 M	\$0.0 M	-\$2.9 M
NYP South Concourse & BOH Renovation	\$1.3 M	\$0	-\$1.3 M
NYP to Moynihan Station Wayfinding Upgrades	\$0.2 M	\$0.7 M	\$0.5 M
NYP West Reconfiguration FY22	\$0.5 M	\$1.9 M	\$1.4 M
Pelham Bay Bridge Replacement Project	\$0.6 M	\$0.7 M	\$0.0 M
Penn Station NY - Infrastructure Renewal	\$38.3 M	\$40.6 M	\$2.3 M
Penn Station NY Scada Phase II	\$0.9 M	\$1.6 M	\$0.6 M
Penn Station NY Sectionalizing Project	\$0.6 M	\$0.2 M	-\$0.4 M
Q Interlocking C&S Equipment Replacement Project	\$6.6 M	\$7.9 M	\$1.3 M
River-to-River Rail (R4) Resiliency: ERT Tunnel Power Upgrades & Flood Mitigation	\$0	\$0.7 M	\$0.7 M
Signal System Upgrades to 562: County to Elmora	\$4.5 M	\$1.4 M	-\$3.1 M
Spuyten Duyvil Fenders System Upgrades Project	\$5.8 M	\$9.1 M	\$3.4 M
Sunnyside Yard Frequency Converter Upgrade Project	\$8.5 M	\$0.2 M	-\$8.3 M
Sunnyside Yard Oil & PCB Remediation	\$0.1 M	\$0.1 M	\$0.0 M
Sunnyside Yard S4 Substation Relocation/Upgrades Project	\$2.5 M	\$5.9 M	\$3.4 M
Sunnyside Yard Service Platform Upgrades	\$2.9 M	\$0.3 M	-\$2.6 M
Sunnyside Yard Watermain Upgrades	\$6.7 M	\$1.0 M	-\$5.7 M
Trenton NJ Commuter Yard Remediation	\$2.7 M	\$0.6 M	-\$2.1 M
Washington Ave. Bridge Replacement Project	\$0.9 M	\$0.3 M	-\$0.6 M
MTA			
Gateway: New York Penn Station Expansion	\$2.0 M	\$0.7 M	-\$1.3 M
Harold Interlocking	\$164.0 M	\$130.5 M	-\$33.5 M
New York Penn Station LIRR Concourse	\$250.0 M	\$222.9 M	-\$27.1 M
New York Penn Station Reconstruction	\$5.0 M	\$0.6 M	-\$4.4 M
New York Penn Station: Platforms 7 & 8 Refurbishment	\$15.2 M	\$1.0 M	-\$14.2 M
Penn Station Access	\$400.0 M	\$313.1 M	-\$86.9 M
River-to-River Rail (R4) Resiliency: West Side Yard and Queens Portal	\$25.0 M	\$0.6 M	-\$24.4 M
NJ TRANSIT			
Delco Lead	\$0	\$2.2 M	\$2.2 M
Elizabeth Station Improvements	\$0	\$4.3 M	\$4.3 M
Gateway: NJ TRANSIT Gateway Storage Yard	\$0	\$0	\$0
Gateway: Portal North Bridge	\$150.0 M	\$178.3 M	\$28.3 M
Hunter Flyover	\$0	\$0.0 M	\$0.0 M
New Brunswick Station Improvements	\$0	\$0.9 M	\$0.9 M
New York Penn Station: NJ TRANSIT Near-Term Improvements	\$1.5 M	\$0.2 M	-\$1.3 M
Newark Penn Station: State of Good Repair Program Phase 1.1, 1.2, 1.3	\$0	\$1.5 M	\$1.5 M

All New York City Metro investments by submitting agency (cont.)

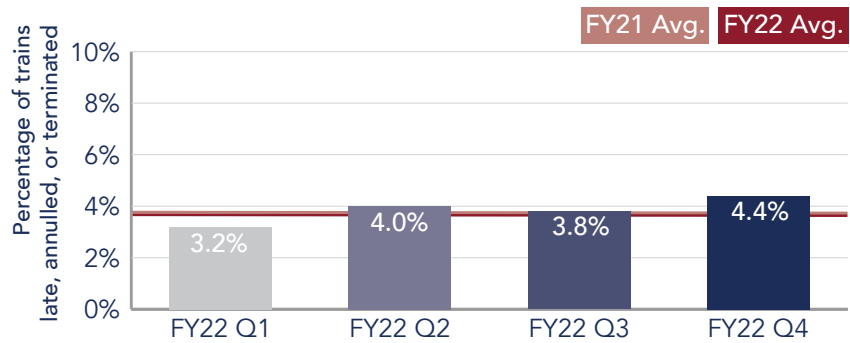
Investment Name	FY22 Planned Expenditure	FY22 Actual Expenditure	Variance
Newark Penn Station: State of Good Repair Program Phase 2.0	\$0	\$1.8 M	\$1.8 M
Newark Penn Station: Station Rehabilitation	\$0	\$0.1 M	\$0.1 M
NJ TRANSITGRID	\$0	\$4.8 M	\$4.8 M
North Brunswick Station	\$0	\$0.5 M	\$0.5 M
North Elizabeth Station Improvements	\$0	\$0.0 M	\$0.0 M
Trenton Transit Center: State of Good Repair Program	\$1.9 M	\$0.9 M	-\$1.1 M

Operations: MTA Long Island Rail Road

MTA Long Island Rail Road (LIRR) operates eleven branch lines, ten of which connect to the NEC at Harold Interlocking in Queens operate into New York Penn Station. Passengers on the Oyster Bay branch heading to Penn Station must transfer at Jamaica Station. Passengers on the Far Rockaway, Hempstead, and West Hempstead branches must frequently make this transfer as well.

Train performance profile

Metric	FY21	FY22
Percent NEC trains late, annulled, or terminated	3.8%	3.8%
Percent NEC trains not completed	0.58%	0.4%
Avg min late per NEC train	10.8	10.6

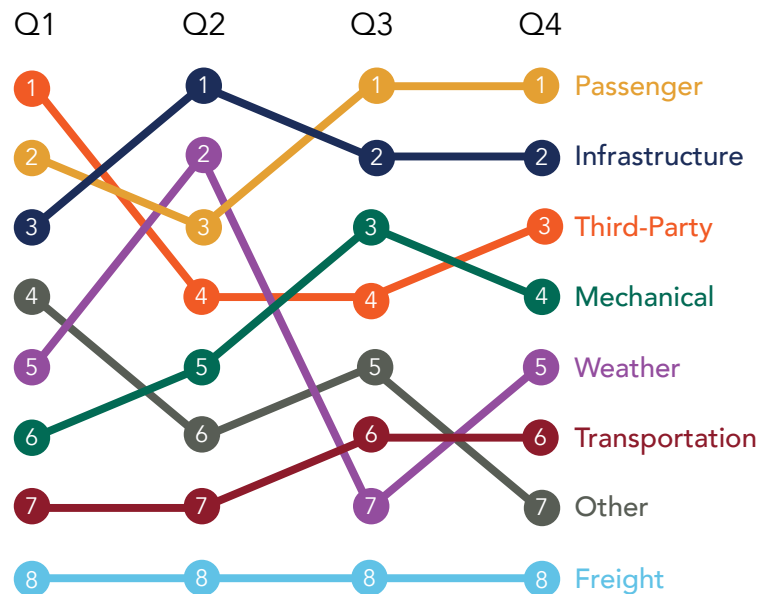


Train-delay minutes by cause

Total and percent change, FY21-22

Cause	FY21	FY22	Change
Infrastructure	19,618	15,566	-20.7%
Mechanical	4,560	5,414	+18.7%
Transportation	1,946	1,841	-5.4%
Passenger	9,215	16,422	+78.2%
Weather	7,491	5,911	-21.1%
Third-Party	10,624	8,630	-18.8%
Freight	329	411	+24.9%
Other	1,798	2,901	+61.3%
Total	55,581	57,096	+2.7%

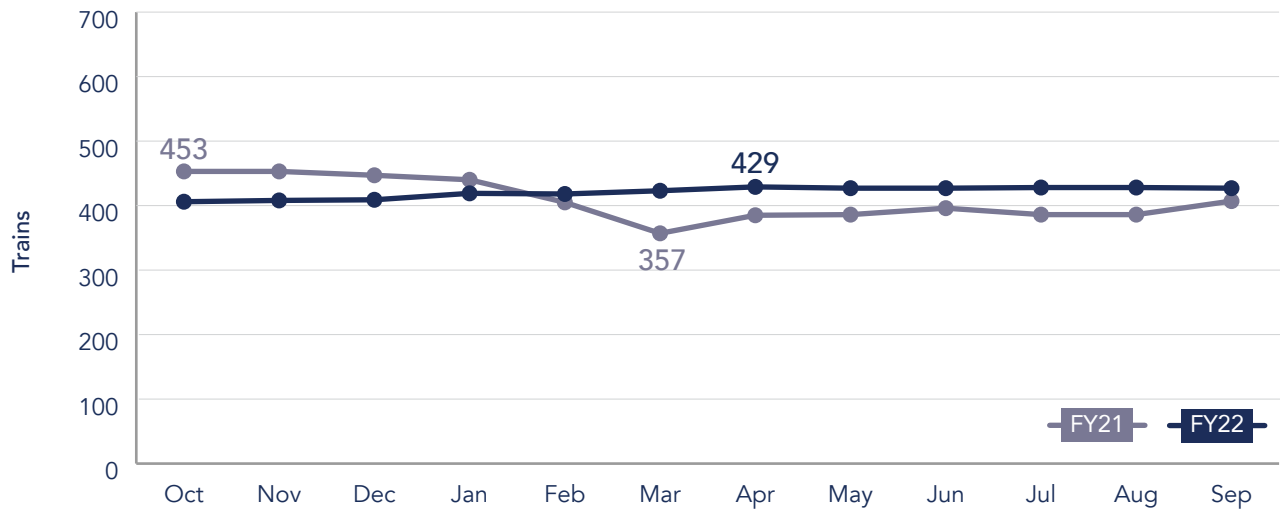
Rank by category, FY21



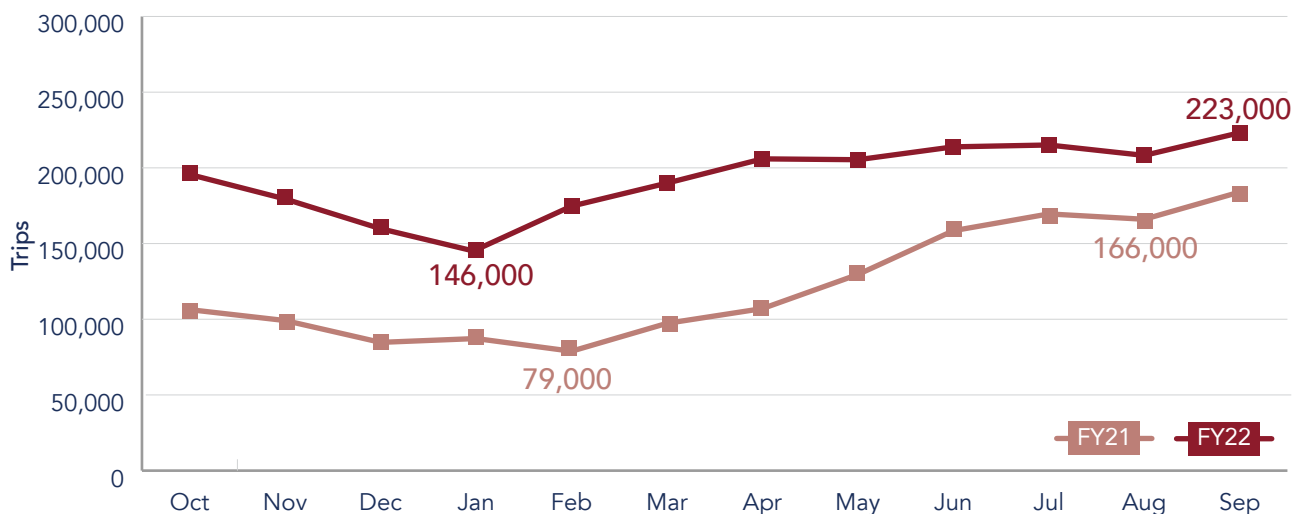
LIRR NEC Service and Ridership

Period	Average Weekday NEC Trains			Average Weekday NEC Trips		
	FY21	FY22	Change from FY21	FY21	FY22	Change from FY21
Q1 (Oct - Dec)	451	408	-10% ↓	96,735	179,478	+86% ↑
Q2 (Jan - Mar)	398	420	+6% ↑	87,803	170,165	+94% ↑
Q3 (Apr - Jun)	389	428	+10% ↑	131,688	208,402	+58% ↑
Q4 (Jul - Sep)	393	428	+9% ↑	173,206	215,510	+24% ↑
FY Average (Oct - Sep)	408	421	+3% ↑	122,358	193,389	+58% ↑

LIRR Average NEC Weekday Trains



LIRR Average NEC Weekday Trips

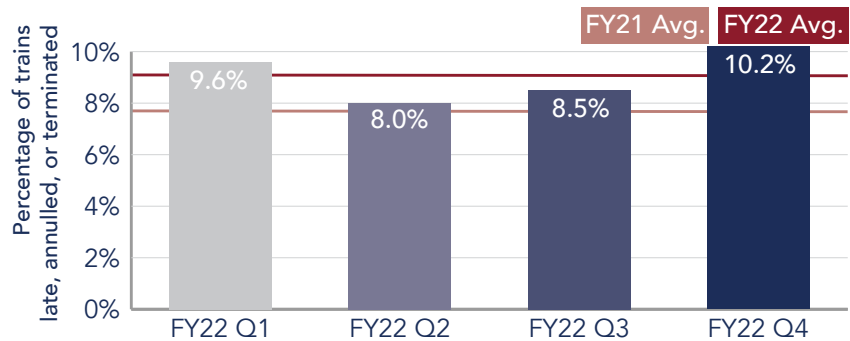


Operations: NJ TRANSIT

NJ TRANSIT (NJT) operates its Northeast Corridor Line service on the NEC Main Line between Penn Station New York and Trenton, NJ. The North Jersey Coast, Midtown Direct, and Raritan Valley Lines to/from Penn Station New York also operate partially on the NEC. The Atlantic City Line operates between Philadelphia 30th St Station and Atlantic City, NJ, partially on the NEC.

Train performance profile

Metric	FY21	FY22
Percent NEC trains late, annulled, or terminated	7.6%	9.1%
Percent NEC trains not completed	1.92%	2.11%
Avg min late per NEC train	14.2	14.8

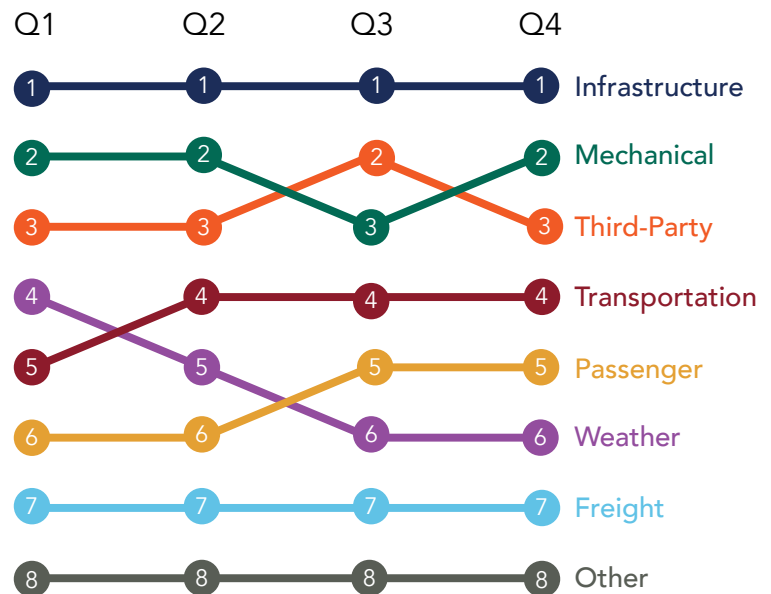


Train-delay minutes by cause

Total and percent change, FY21-22

Cause	FY21	FY22	Change
Infrastructure	45,121	58,655	+30.0%
Mechanical	26,814	40,725	+51.9%
Transportation	10,873	14,246	+31.0%
Passenger	7,684	9,857	+28.3%
Weather	12,155	9,038	-25.6%
Third-Party	24,704	33,365	+35.1%
Freight	940	1,387	+47.6%
Other	2,727	476	-82.5%
Total	131,018	167,749	+28.0%

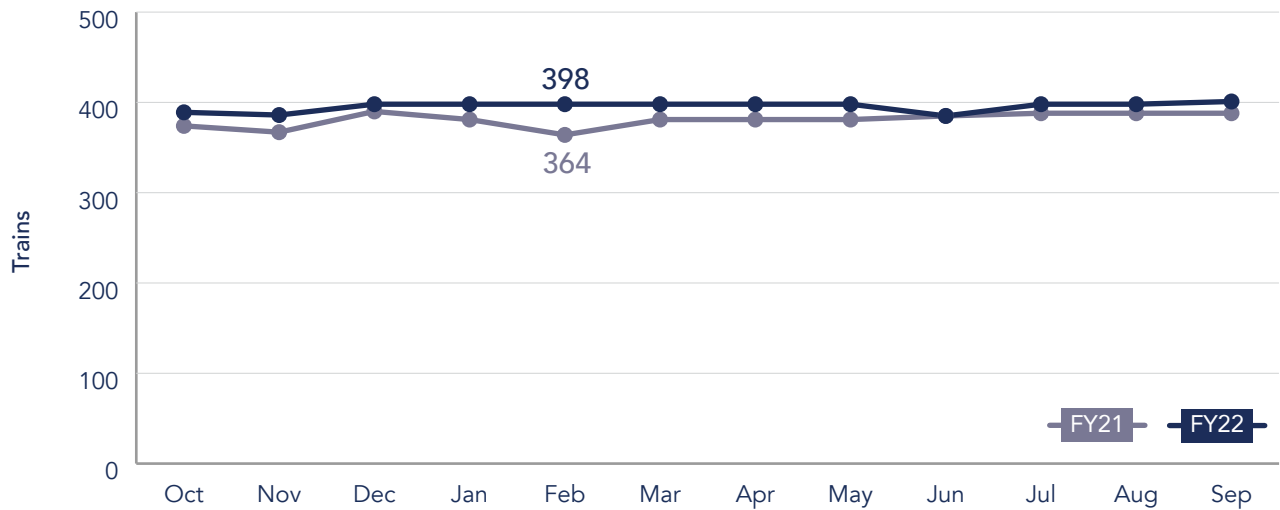
Rank by category, FY21



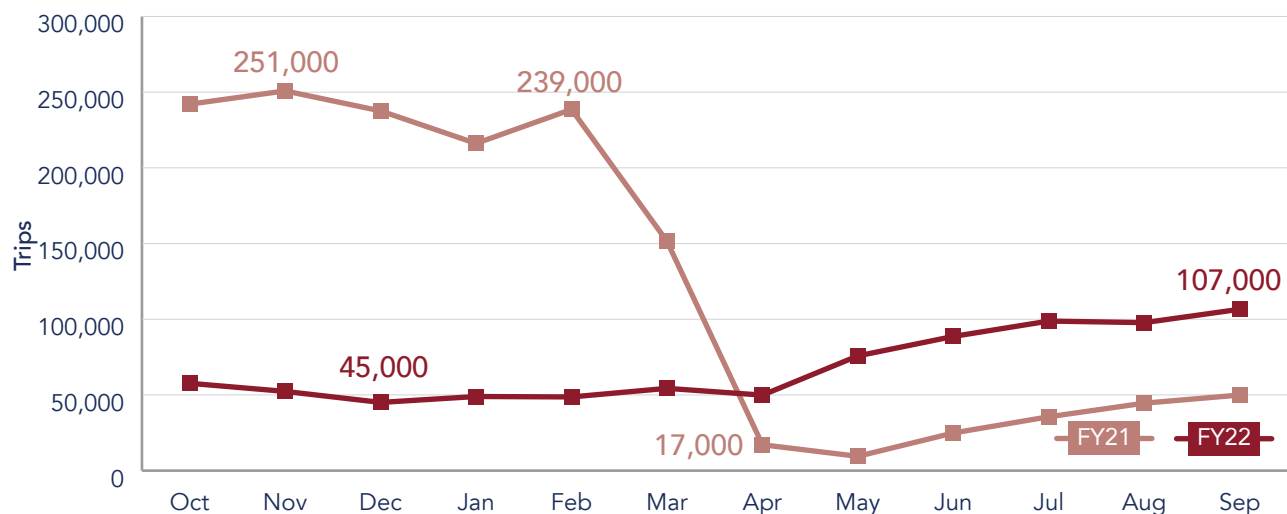
NJ TRANSIT NEC Service and ridership

Period	Average Weekday NEC Trains			Average Weekday NEC Trips		
	FY21	FY22	Change from FY21	FY21	FY22	Change from FY21
Q1 (Oct - Dec)	378	391	+3% ↑	51,687	122,122	+136% ↑
Q2 (Jan - Mar)	376	398	+6% ↑	50,659	103,495	+104% ↑
Q3 (Apr - Jun)	383	393	+3% ↑	71,441	134,754	+89% ↑
Q4 (Jul - Sep)	388	399	+3% ↑	101,345	144,474	+43% ↑
FY Average (Oct - Sep)	381	395	+4% ↑	68,783	126,211	+83% ↑

NJ TRANSIT Average NEC Weekday Trains



NJ TRANSIT Average NEC Weekday Trips



Region: Mid-Atlantic North

Infrastructure and Operations Detail

Operators: Amtrak, NJ TRANSIT, SEPTA

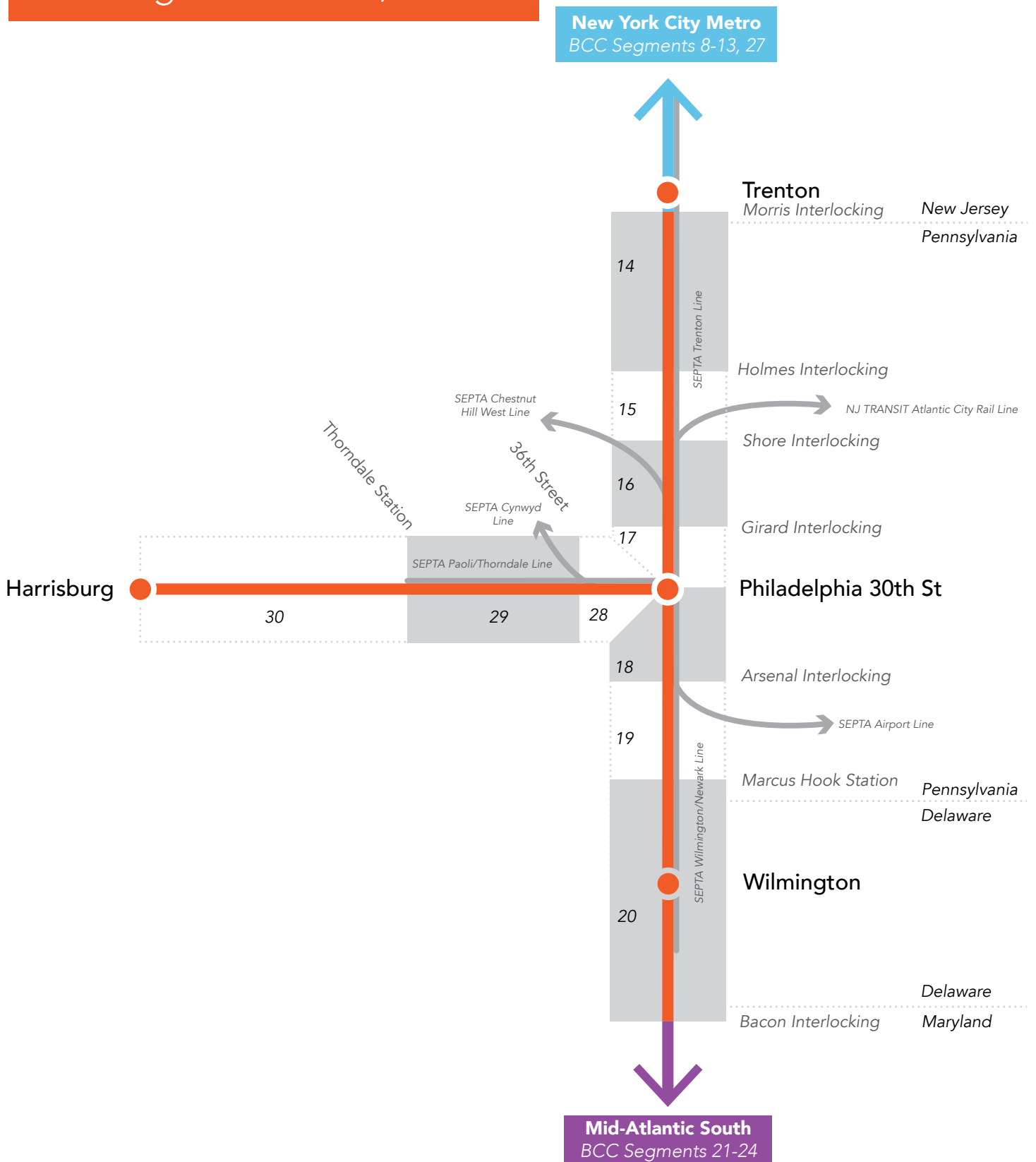
RoW Owner: Amtrak

BCC Segments

- 14: Morris to Holmes
- 15: Holmes to Shore
- 16: Shore to Girard
- 17: Girard to Philadelphia 30th Street
- 18: Philadelphia 30th Street to Arsenal
- 19: Arsenal to Marcus Hook
- 20: Marcus Hook to Bacon
- 28: Philadelphia 30th Street to 36th St
- 29: 36th Street to Thorndale
- 30: Thorndale to Harrisburg

Mid-Atlantic North

BCC Segments 14-20, 28-30



Infrastructure

Amtrak, SEPTA, Pennsylvania DOT, and Delaware DOT coordinate on work throughout the Mid-Atlantic North region. In total, \$82 million was invested in FY22 (98% of plan).

10 largest investments by FY22 actual expenditure, Mid-Atlantic North

1. Philadelphia 30th Street District Plan (Amtrak)		
FY22 Planned Expenditure & Scope	\$23.5 M	Advance designs for station redevelopment, including Amtrak office stacking and swing space preparation for construction.
FY22 Actual Expenditure & Accomplishments	\$62.0 M	Progression of design and finding of no adverse effects for NEPA 106 <input checked="" type="checkbox"/> Finalize 60% Design Documentation: Achieved May 2022 <input checked="" type="checkbox"/> Finalize 100% Design Documentation: <i>Now estimated Jun 2023</i>
Variance & Explanation	\$38.5 M	The variance results from a change in the project's accounting since the FY22 planned expenditure was calculated. The project's actuals are now based on percentage of work completed. Future planning and reporting will reflect this methodology.
2. Mid-Atlantic North Track Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$27.1 M	The FY22 scope of the program is track improvements throughout the Mid Atlantic North division. This work includes the following: <ul style="list-style-type: none"> • Insulated joint replacement on AN Line (MP1.9-87.7) and AP Line (MP1.4-87.7) • Joint elimination on AH Line (MP1.9-105.2) and AP Line (MP1.4-87.7) • Concrete tie replacement on AN Line (MP77.2-87.7) and AP Line (MP1.4-29.6) • Tie and Timber replacement on AH Line (MP1.9-105.2), AN Line (MP77.2-87.7), and AP Line (MP1.4-29.6)
FY22 Actual Expenditure & Accomplishments	\$36.0 M	The MAD North Track Program continued the implementation of track asset upgrades and modifications on PRIIA segments along the AH line (between Philadelphia and Harrisburg, PA) and the AN line (Holmes to Penn interlockings) and the upper segment of the AP line (Penn to Ragan). Continuous work of a reactive nature was performed on insulated joints, joint elimination, spot surfacing, spot undercutting, interlocking steel, drainage improvements, plus timber and concrete ties. Improvements were also made at Penn Coach, Thorndale, Dock Street, Lime Street, West and Wilmington Yards. Advancement on stand-alone projects include advancement of the Scope of Work for drainage improvements at Mount Joy; and roadbed stabilization improvements at Christiana Curve. Both are on the AH line. This MAD North program will be merged into the MAD South Track Program for FY23 and beyond. Efforts across multiple departments were coordinated to facilitate this action.
Variance & Explanation	\$8.9 M	This is an existing STIP Mid-Atlantic North program whose Annual Operating Plan (AOP) budget was reduced in FY22. A change request was made in June 2022 for an additional \$9 million, revising the FY22 AOP to \$35 million.
3. Claymont Transportation Center (Delaware DOT)		
FY22 Planned Expenditure & Scope	\$22.0 M	Erect pre-cast parking garage. Commence construction of station building.
FY22 Actual Expenditure & Accomplishments	\$24.8 M	Erected garage and stair towers. Received and assembled pedestrian bridge. Performed utility work along Philadelphia Pike. Commenced catenary and platform construction work. <input checked="" type="checkbox"/> Commence Station Construction: Achieved Dec 2021
Variance & Explanation	\$2.8 M	None to report.
4. Coatesville Station Improvements (Pennsylvania DOT)		
FY22 Planned Expenditure & Scope	\$8.4 M	Bid, award, and begin construction on south tower and platform
FY22 Actual Expenditure & Accomplishments	\$15.3 M	Construction contracts were awarded and construction began on the south side of the ROW. <input checked="" type="checkbox"/> Notice to Proceed (Construction contract awarded to contractor): Achieved Nov 2021 <input checked="" type="checkbox"/> Begin Construction on New South Platform & Tower: Achieved Mar 2022

Investment detail including expenditures, accomplishments, and explanation of variances are published as submitted by agencies.

10 largest investments by FY22 actual expenditure, Mid-Atlantic North (cont.)

Variance & Explanation	\$6.9 M	Long lead materials were ordered and Amtrak was able to advance track work ahead of initial schedule
5. Mid-Atlantic North Substations Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$13.9 M	<p>The FY22 scope of the program is substation improvements throughout the Mid Atlantic North division. This work includes the following:</p> <ul style="list-style-type: none"> • Lamokin Substation-resistor banks replacement, control house roof replacement, and 4L breaker replacement • North Philadelphia Substation-12KV Breaker replacement • Paoli Substation-12KV Switch replacement and RTU upgrades • Zoo Substation-109 ABS Replacement • Glenolden Substation-Battery Replacement • Bellevue Substation-Battery replacement • West Yard Substation-Control house replacement design • Richmond Substation-relay upgrades, SFC battery, SFC camera, fall arrest upgrades, HVAC upgrade design, and puffer breakers overhaul • Distribute network protocol for Richmond Frequency Convertor
FY22 Actual Expenditure & Accomplishments	\$11.1 M	<p>The MAD North Structures Program continued the implementation of structure asset upgrades and modifications on ROW structures along the AH line (between Philadelphia and Harrisburg, PA) and the AN line (Holmes to Penn interlockings) and the upper segment of the AP line (Penn to Ragan). FY22 accomplishments include successful completion of:</p> <ul style="list-style-type: none"> • 1 Wall Replacement design package for Pennsylvania Mile Post 4.85 Darby. • 2 Bridge Tie Replacement design packages for Pennsylvania Mile Post 13.42 Welsh Street Track 3 and Pennsylvania Mile Post 13.96 Parker Street Track 1. • 6 Bridge Tie replacements for Pennsylvania Mile Post 13.96 Parker Street Track 1 and Track 2, Pennsylvania Mile Post 14.02 Kerlin Street Track 2, Pennsylvania Mile Post 13.42 Welsh Street Track 3, Pennsylvania Mile Post 14.94 Yarnall Street Track 3, Pennsylvania Mile Post 15.63 Wilson Street Track 3. • 4 bridge rehabilitations for Undergrade Bridge at Pennsylvania Mile Post 28.35 Whiteford Rd, at Pennsylvania Mile Post 84.97 Lehigh Ave, Pennsylvania Mile Post 8.32 Glenolden Ave, at Pennsylvania Mile Post 83.70 6th St. • 1 Culvert Upgrade at Pennsylvania Mile Post 48.99 and 2 Culvert Rehabilitations at Pennsylvania Mile Post MP34.8 Thorndale Twin Culvert and at Pennsylvania Mile Post 45.88 Lenover. • 3 Signal Bridge Component Upgrades at Pennsylvania Mile Post 3.15 Zoo West Bound Home Signal, at Pennsylvania Mile Post 85.07 Lehigh West Bound Home Signal, at Pennsylvania Mile Post 87.12 Mantua West Bound Home Signal. Worked on various other projects under this multi-project/multi-year Program.
Variance & Explanation	-\$2.8 M	Program overspent planned scope and required an off-cycle reprogramming to increase budget to accommodate for FY21 carryover work/projects and to add allocations to complete Signal Bridge Component Upgrades at Pennsylvania Mile Post 13.21 Radnor on AH Line, to cover emergency cost incurred to Rehabilitate Undergrade Bridge at Pennsylvania Mile Post 35.27 S. Baily Rd on AH Line and closed out projects.
6. Amtrak System - Ride Quality Improvement Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$15.7 M	The work for FY22 includes addressing ride quality issues by improving the drainage (in the affected areas), bridge approaches and exits by removing the ballast/sub ballast and replacing it with a Geoweb (that will then be filled with ballast). The netting is used to stiffen the area and absorb the impact when trains go across and the Geo Cell will be used to create a gradual slope to the bridges. The bridge approaches that will be worked on include: Central Avenue, Tilghman Road, Kerlin Street, Parker Street, and Barclay Street. Work also includes cleaning out the viaduct, side trenches, and correcting any other drainage issues. The project will work on TK(s) #2, and #3 in FY22.
FY22 Actual Expenditure & Accomplishments	\$11.1 M	<p>The original work for FY22 included addressing the ride quality issues on and in between several bridges by improving the drainage (in the affected areas), bridge approaches and exits by removing the ballast/sub ballast and replacing it with a Geoweb (that will then be filled with ballast). The netting was used to stiffen the area and absorb the impact when trains go across and the Geo Cell will be used to create a gradual slope to the bridges. The bridge approaches that will be worked on include: Central Avenue, Tilghman Road, Kerlin Street, Parker Street, and Barclay Street. The work also included cleaning out the viaduct, side trenches, and correcting any other drainage issues. The project completed the work on TK(s) #2, and #3 in FY22. The total project was completed in April 2022. (TK #2, went back into service on 12/17/21.) (TK #3, went back into service on 3/25/22.) (New scope of work was added in March, to allow B&B to install timbers on Parker Bridge, on TK #1. This work was completed in April.) (Side Note: Week of 4/18: Gang performed ROW cleanup, including moving old rail to Lower 5. Then on 4/26, and 4/27: Gang Y242 performed joint elimination on TK #1, at MP 14, Parker St. Bridge.) An ECR was submitted by the PM in the beginning of May to give back approximately \$5.0M.</p>

Investment detail including expenditures, accomplishments, and explanation of variances are published as submitted by agencies.

10 largest investments by FY22 actual expenditure, Mid-Atlantic North (cont.)

Variance & Explanation	-\$4.6 M	The original work planned for FY22 was completed earlier than scheduled and for a lower cost. (The added scope was absorbed by the project's original budget.) There were two reasons why the project completed the work faster and cheaper: The machine operators became more efficient, and more efficient work methods were developed by the task manager and work crew. An ECR was submitted by the PM in the beginning of May to give back approximately \$5.0M.
7. Total Track Renewal Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$10.4 M	The full replacement of concrete embedded block tie track, include rail, fastening at 30th Street Station on tracks 5 and 6.
FY22 Actual Expenditure & Accomplishments	\$8.0 M	The Block Tie Rehab Project at 30th Street Station involves the replacement of 2 (Track 5 & 6) 1,340 ft sections of track due to the severe deterioration of the concrete and block ties. The existing track infrastructure had reached its maximum life expectancy and as a result, required a complete demolition and replacement.
Variance & Explanation	-\$2.4 M	The budget variance can be attributed the forecasted environmental cleanup cost.
8. Mid-Atlantic North Catenary Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$9.1 M	The FY22 scope of the program is catenary improvement throughout the Mid Atlantic North division. This work includes the following: <ul style="list-style-type: none"> • Switch heater replacement at Bryan Mawr, Overbook, Shore, and Phil Interlockings • AN Line Wheatsheaf Catenary Portal Install • Paoli Interlocking Switch motor and cable replacement • Battery replacement at AP LN MP17.1-29.6 • AH Line Pole Repairs • AN Line N 8 Pole Repairs
FY22 Actual Expenditure & Accomplishments	\$5.4 M	Completed project designs. Developed and performed workarounds enabling project execution despite of material and workforce shortfalls. Completed switch heater upgrade and replacement projects and line replacement upgrades.
Variance & Explanation	-\$3.6 M	Poor variance performance was the result of supply chain deficiencies and related material delivery delays, particularly steel, and a shortfall of qualified vendors to provide acceptable performance practices and therefore timely cost-effective products and services.
9. Ardmore Transportation Center: Phase 1 ADA Improvements (SEPTA)		
FY22 Planned Expenditure & Scope	\$5.1 M	Continue construction
FY22 Actual Expenditure & Accomplishments	\$5.2 M	Construction is now 35% complete. <input checked="" type="checkbox"/> 25% Construction: Achieved Aug 2022
Variance & Explanation	\$0.1 M	Unforeseen site conditions and issues with force account labor have resulted in lower expenditure for this quarter.

Investment detail including expenditures, accomplishments, and explanation of variances are published as submitted by agencies.

10 largest investments by FY22 actual expenditure, Mid-Atlantic North (cont.)

10. Mid-Atlantic North Structures Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$2.3 M	<p>The FY22 scope of the program is structures improvements throughout the Mid Atlantic North division. This work includes the following:</p> <ul style="list-style-type: none"> • Bridge Tie replacement for Parker St Tk2 (PA13.96), Kerlin St Tk2 (PA 14.02), Yarnall St Tk3 (PA 14.94), Welsh St Tk 3 (PA 13.42), and Wilson St Tk3 (PA 15.63) • Bridge Tie design at Chester Viaduct Tk1 (PA 13.51), Yarnall St Tk3 (PA14.94), Parker St Tk2 (PA 13.96), Wilson St Tk3 (PA 15.63), and Kerlin St Tk2 (PA14.02) • Final Design of Darby Wall Replacement (MP 4.85) • Final Design of Welsh St Bridge Tie (PA 13.42)
FY22 Actual Expenditure & Accomplishments	\$4.8 M	<ul style="list-style-type: none"> • Final Design of 0004 Darby Wall Replacement (MP4.85) was completed. • Bridge Tie design was completed for 0011 Welsh St Bridge Tie (PA 13.42) and 0027 Parker St Tk1 (PA 13.96) 0011 Welsh St Bridge Tie (PA 13.42) and substantially completed for 0034 Chester Viaduct Tk1 (PA 13.51). • Began procurement of design and specialized detailed inspection services for 0014 Penn Coach Yard Stringers Rehabilitation (MP88.0) to rehabilitation and support the failing stringers in Penn Coach Yard under the access roadway and former parking area at 30th street Station yard. • Construction was completed for Bridge Tie replacement for 0032 Parker St Tk2 (PA13.96), 0033 Kerlin St Tk2 (PA 14.02), 0031 Yarnall St Tk3 (PA 14.94), 0030 Welsh St Tk 3 (PA 13.42), and 0038 Wilson St Tk3 (PA 15.63), Parker St Tk1 (PA13.96). • Bridge Tie replacement procurement was started for 0022 Barclay St Tk1 (PA13.79) and 0023 Concord Ave Tk1 (PA13.83). • Bridge Rehabilitation was completed for 0012 Whiteford Rd (PA28.35), 0015 Lehigh Ave (PA84.97), 0018 Glenolden Ave (PA8.32), 0020 6th St (PA83.70). • Culvert Upgrades were completed for 0029 Christiana PA MP48.99 Culvert. • Culvert Rehabilitation was completed for 0041 Thorndale PA Twin Culvert (MP34.8), 0045 Lenover PA (MP45.88). • Signal Bridge Upgrades were completed for 0040 Zoo West Bound Home Signal (MP3.15), 0042 Lehigh West Bound Home Signal (MP85.07), 0046 Mantua West Bound Home Signal (MP87.12) and substantially completed for 0048 Radnor Signal (MP13.21) and 0050 Paoli East Bound and West Bound Home Signal (MP19.50/19.96) .
Variance & Explanation	\$2.4 M	<p>Program substantially completed scope per plan and finished with a budget variance of approximately 4.5% (\$4.4M actuals vs \$4.6M plan) in FY22. Bridge Tie replacement for 0022 Barclay St Tk1 (PA13.79) and 0023 Concord Ave Tk1 (PA13.83), Preliminary Design of 0043 52nd Street Bridge Load Rating for new ICT train sets (MP4.06C), Bridge Rehabilitation for 0044 Belmont Rd (PA55.94) and 0047 Oak St (PA42.40) was deferred to FY23 and did not start/completed as anticipated.</p>

All Mid-Atlantic North investments by submitting agency

Investment Name	FY22 Planned Expenditure	FY22 Actual Expenditure	Variance
Amtrak			
30th Street Station - UPS Replacement	\$0.8 M	\$0.5 M	-\$0.3 M
30th Street Station Facade Restoration Project	\$0.0 M	\$0.0 M	-\$0.0 M
Amtrak System - Ride Quality Improvement Program	\$15.7 M	\$11.1 M	-\$4.6 M
Brill to Landlith OCS Improvements Project	\$5.3 M	\$2.5 M	-\$2.7 M
CETC 30th Street Station HVAC Upgrades FY22	\$0.5 M	\$0	-\$0.5 M
Conestoga Substation Improvements Project	\$2.1 M	\$2.0 M	-\$0.1 M
Conestoga to Royalton Transmission Line Replacement Project	\$2.7 M	\$1.3 M	-\$1.4 M
Harrisburg Line Signal Upgrade: Park to Paoli	\$0.8 M	\$1.8 M	\$1.0 M
Harrisburg Station Train Shed Improvements	\$0	\$0.1 M	\$0.1 M
Intercity Trainset (ICT) Maintenance Facilities: Penn Coach Yard	\$0	\$2.7 M	\$2.7 M
Lancaster PA Platform & Roof Replacement	\$0	\$0.8 M	\$0.8 M
Mid-Atlantic North Catenary Program	\$9.1 M	\$5.4 M	-\$3.6 M
Mid-Atlantic North Facilities Program	\$1.8 M	\$0.3 M	-\$1.5 M
Mid-Atlantic North Signals Program	\$1.6 M	\$3.2 M	\$1.6 M
Mid-Atlantic North Structures Program	\$2.3 M	\$4.8 M	\$2.4 M
Mid-Atlantic North Substations Program	\$13.9 M	\$11.1 M	-\$2.8 M
Mid-Atlantic North Track Program	\$27.1 M	\$36.0 M	\$8.9 M
Penn Coach Yard High Mast Lighting Project	\$0.2 M	\$0.6 M	\$0.5 M
Penn Coach Yard Paving Improvements Project	\$3.2 M	\$0.1 M	-\$3.1 M
Penn Coach Yard Water Main Replacement Project	\$3.2 M	\$0.1 M	-\$3.1 M
Pennswood Bridge Catenary Improvements	\$0	\$0.1 M	\$0.1 M
Philadelphia 30th Street District Plan	\$23.5 M	\$62.0 M	\$38.5 M
Philadelphia 30th Street Station Platform PCB Remediation	\$0.9 M	\$0.8 M	-\$0.1 M
Sellers Avenue Bridge Reconstruction	\$1.0 M	\$0	-\$1.0 M
SUB CONESTOGA STEPUP YARD - PURCHASE FACILITY	\$0	\$5.8 M	\$5.8 M
Total Track Renewal Program	\$10.4 M	\$8.0 M	-\$2.4 M
Wilmington DE Maintenance Facility Stormwater Program	\$0.4 M	\$0.2 M	-\$0.1 M
Wilmington DE MOFE Facility PCB Remediation	\$2.6 M	\$1.6 M	-\$1.0 M
Wilmington DE Platform Lighting Upgrades FY22	\$0.4 M	-\$0.0 M	-\$0.4 M
Wilmington DE Vertical Transportation Program	\$0	\$3.6 M	\$3.6 M
Wilmington DE West Yard Remediation	\$0.3 M	\$0.0 M	-\$0.2 M
Wilmington High Speed Rail Training Center Roof Upgrades	\$0.1 M	\$0	-\$0.1 M
Wilmington Station Refresh Program	\$0.3 M	\$0.2 M	-\$0.1 M
Wilmington Training Center Parking Access Improvements Project	\$1.1 M	\$0.0 M	-\$1.1 M
Zoo to Paoli Catenary Structure Upgrade Project	\$1.4 M	\$1.1 M	-\$0.4 M

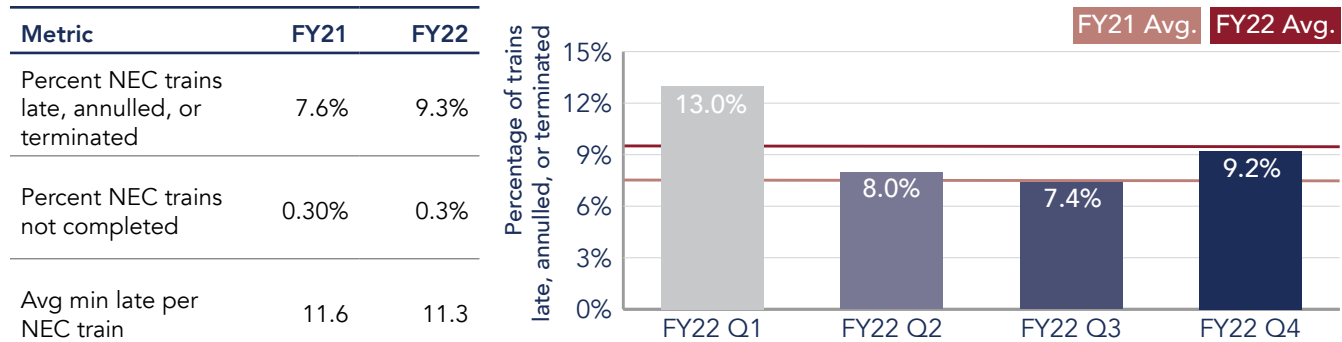
All Mid-Atlantic North investments by submitting agency (cont.)

Investment Name	FY22 Planned Expenditure	FY22 Actual Expenditure	Variance
SEPTA			
30th Street West Catenary Replacement	\$1.4 M	\$0.5 M	-\$0.8 M
Ardmore Transportation Center: Phase 1 ADA Improvements	\$5.1 M	\$5.2 M	\$0.1 M
Bristol Station Improvements	\$0	\$0	\$0
Frazer Rail Shop and Yard Upgrade	\$2.0 M	\$0.5 M	-\$1.5 M
Harrisburg Line Signal Upgrade: Paoli to Overbrook	\$0.7 M	\$0	-\$0.7 M
Harrisburg Line Track 2 Upgrade: Glen to Thorn (MP 25.3 to 35.0)	\$12.4 M	\$0.7 M	-\$11.7 M
Marcus Hook Station Improvements	\$0	\$0	\$0
Southwest Connection Improvement Project	\$9.2 M	\$2.0 M	-\$7.3 M
Pennsylvania DOT			
Coatesville Station Improvements	\$8.4 M	\$15.3 M	\$6.9 M
Downingtown Station Improvements	\$1.8 M	\$2.2 M	\$0.4 M
Harrisburg Line Interlocking Improvements: Zoo - Phase 1 (Early Action)	\$3.2 M	\$0.6 M	-\$2.6 M
Lancaster Station Improvements	\$2.0 M	\$1.4 M	-\$0.6 M
Middletown Station Improvements	\$0	\$3.8 M	\$3.8 M
Parkesburg Station Improvements	\$0.3 M	\$0.0 M	-\$0.3 M
Delaware DOT			
Claymont Transportation Center	\$22.0 M	\$24.8 M	\$2.8 M
Newark (DE) Regional Transportation Center	\$32.0 M	\$0.7 M	-\$31.3 M

Operations: SEPTA

SEPTA operates on the NEC Main Line between Trenton, NJ and Newark, DE and on an NEC Branch Line between Philadelphia 30th Street Station and Thorndale, PA. Three additional SEPTA lines operate partially on the NEC and all SEPTA lines are accessible via Philadelphia 30th Street. SEPTA service in Delaware is operated on behalf of Delaware DOT.

Train performance profile

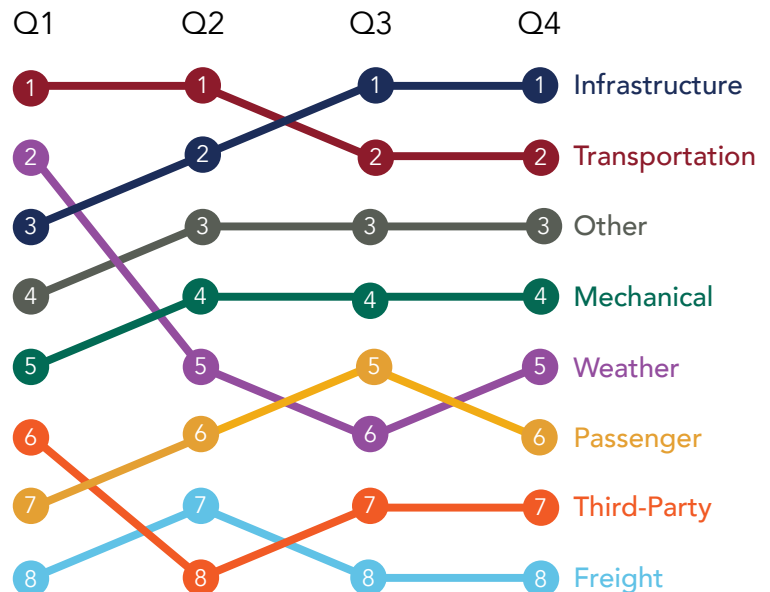


Train-delay minutes by cause

Total and percent change, FY21-22

Cause	FY21	FY22	Change
Infrastructure	13,251	21,361	+61.2%
Mechanical	6,882	11,248	+63.4%
Transportation	16,340	23,234	+42.2%
Passenger	4,016	2,572	-36.0%
Weather	10,587	8,196	-22.6%
Third-Party	569	2,327	+309.0%
Freight	408	478	+17.2%
Other	6,550	15,774	+140.8%
Total	58,603	85,190	+45.4%

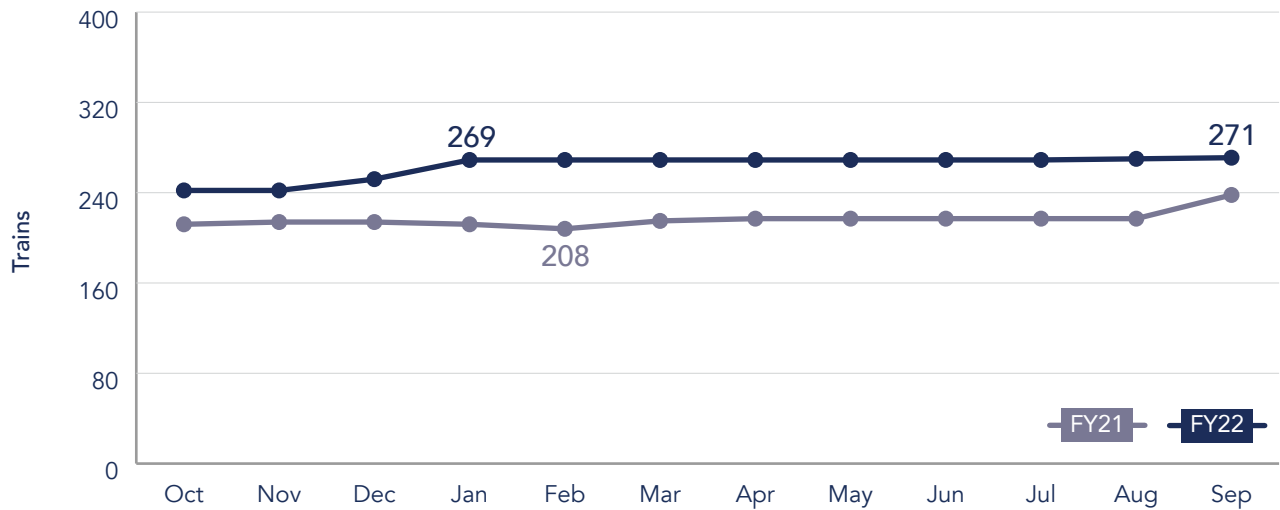
Rank by category, FY22



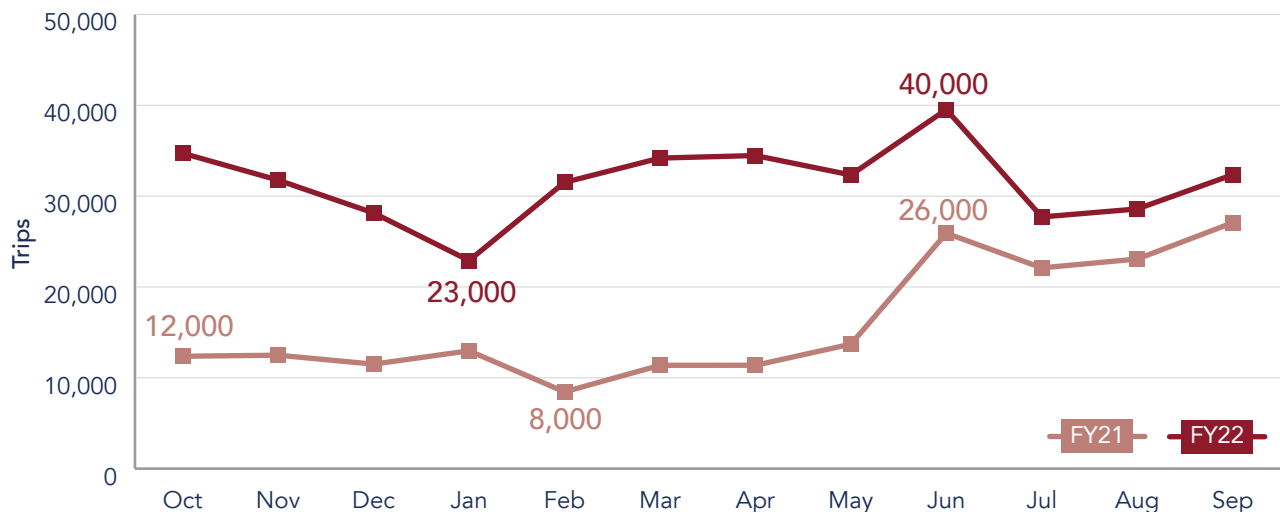
SEPTA NEC Service and Ridership

Period	Average Weekday NEC Trains			Average Weekday NEC Trips		
	FY21	FY22	Change from FY21	FY21	FY22	Change from FY21
Q1 (Oct - Dec)	213	245	+15% ↑	12,121	31,544	+160% ↑
Q2 (Jan - Mar)	212	269	+27% ↑	10,933	29,538	+170% ↑
Q3 (Apr - Jun)	217	269	+24% ↑	17,000	35,444	+108% ↑
Q4 (Jul - Sep)	224	270	+21% ↑	19,272	29,552	+53% ↑
FY Average (Oct - Sep)	217	263	+21% ↑	14,831	31,520	+113% ↑

SEPTA Average NEC Weekday Trains



SEPTA Average NEC Weekday Trips



Region: Mid-Atlantic South

Infrastructure and Operations Detail

Operators: Amtrak, MARC, VRE

RoW Owner: Amtrak

BCC Segments

21: Bacon to Perryville

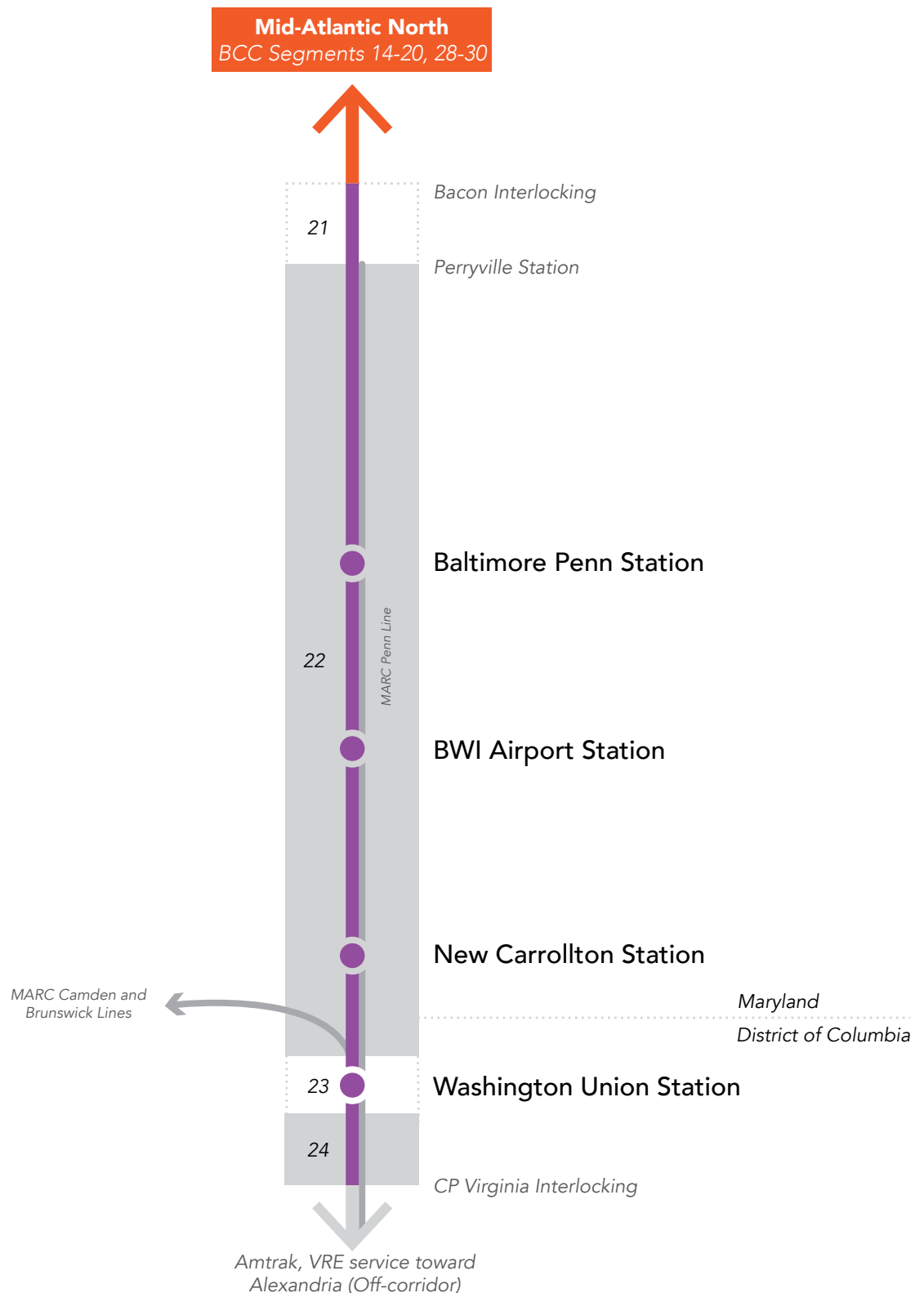
22: Perryville to Washington Union Station

23: Washington Union Terminal

24: Washington Union Station to CP Virginia

Mid-Atlantic South

BCC Segments 21-24



Not all intermediate stations shown.

Infrastructure

Amtrak, MDOT MTA / MARC, and VRE coordinate on work throughout the Mid-Atlantic South region. In total, \$87 million was invested in FY22 (68% of plan).

10 largest investments by FY22 actual expenditure, Mid-Atlantic South

1. B&P Tunnel Replacement Program (Amtrak)

Note: All B&P Tunnel Replacement Program elements from FY22-26 CIP have been combined into a single project for NEC Commission reporting. All planned scopes, expenditures, and milestones have been combined.

FY22 Planned Expenditure & Scope	\$46.7 M	The FY22 Planning and Program Management scope includes updating the program management components (including updates to the baseline scope, integrated master schedule, and budget), continuing stakeholder engagement components, drafting and advancing negotiations on critical third-party agreements, obtaining necessary regulatory approvals and continuing the coordination of program reporting. The FY22 Design scope is the continuing advancement of Program final design. This includes select revisions to preliminary engineering as required by project phasing and advancement of final design pursuant to the ongoing definition of program elements, work packages and staging along with project delivery strategy, early action and critical path activities. The FY22 scope includes the commencement of historic salvage of materials in accordance with the requirements of the Section 106 Programmatic Agreement and early demolition work in support of the Intermediate Ventilation building. This year's scope includes the completion of approximately 30 property acquisitions and the initiation of the acquisition and relocation processes for additional properties that are necessary for the B&P Tunnel Replacement Program. It also includes property acquisition planning, property research, initiation of plats and appraisals for future year acquisitions, and updates to the estimated cost of property acquisition. This work during FY22 is critical to enabling the timely acquisition of properties in future years. The FY22 scope is the ongoing development of general procurement strategies, construction procurement of the Warwick Avenue Bridge replacement and select relocation of Amtrak utilities. The FY22 scope is completion of final design and network configuration change approval and the start of long lead special trackwork procurement for the replacement and upgrade of five miles of track on Track A between MP 103.4 to MP 98.2 on the Philadelphia Line, Mid-Atlantic Division in Baltimore County. The FY22 scope is the start of long lead special trackwork procurement for Wilkens Interlocking, a new universal interlocking on four tracks between curves 384 and 385 on the Philadelphia Line, Mid-Atlantic Division in Baltimore County. The scope also includes select work fulfilling the requirements of the Section 106 Programmatic Agreement, coordination of force account labor resources and outage requirements along with commencement of long lead C&S fabrication activities self-performed by Amtrak.
FY22 Actual Expenditure & Accomplishments	\$43.2 M	<ul style="list-style-type: none"> Submitted 100% Warwick Ave Bridge design packages. Submitted 60% design for Southern Approach Utility and Roadway Relocations. Submitted 30% Wilkens Interlocking Force Account Design. Submitted 60% Design of South Approach Structures. Submitted 60% Lafayette Bridge Reconstruction design. Submitted 30% West Baltimore MARC Station design. Continued community outreach throughout FY22, including project team participation in community service events, and program open houses. Completed NEPA Re-evaluation #1 with FRA and submitted Re-evaluation #2. For property acquisition and management, Real Estate completed: appraisals (42), offers made (49), offers accepted (32), condemnations filed (3), settlements (12), including properties critical for Intermediate Vent Facility site, relocations identified (34), relocations completed (6). Amtrak property management consultant mobilized during FY22. Resubmitted 30% design for Track A Winans to Bridge; network configuration change approval completed. FRA granted pre-award authority for Track A Winans to Bridge and environmental categorical exclusion. Finalized CMAR delivery strategy for Southern Approach (Package B) Construction package and initiated procurement process. Procurement underway for Warwick Bridge Replacement, Demolition, and Independent Cost Estimator contracts. Labor clearance negotiations underway for Warwick Ave Bridge and other project elements. Obtained Network configuration change approval for new Wilkens Interlocking. ✓ [Construction - Track A Winans to Bridge] Project Start: Achieved Oct 2021 ✓ [Property Acquisition] Complete first FY22 acquisition: Achieved Feb 2022 ✓ [Construction - Approaches] Start project: Achieved Apr 2022 ✓ [Planning, Program Management, Design] Finish project budget baseline: Achieved May 2022 ✓ [Construction - Phase 1 Tunnel] Project Start: Achieved Jun 2022 ✓ [Planning, Program Management, Design] Project schedule baseline approve finish: Achieved Aug 2022 ✓ [Wilkens] Start project: Achieved Aug 2022 <p><i>Additional milestones not shown were reported in FY22. List of milestones for report edited to reduce duplication with Accomplishments narrative provided above.</i></p>
Variance & Explanation	-\$3.6 M	FY22 exceeded program plan by 8% as a result of progress made in program management and design exceeding plan. This variance was offset by an underspend against plan for procurement and acquisition activities associated with select demolition.

Investment detail including expenditures, accomplishments, and explanation of variances are published as submitted by agencies.

10 largest investments by FY22 actual expenditure, Mid-Atlantic South (cont.)

2. Mid-Atlantic South Track Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$25.1 M	Insulated joint replacement, joint elimination, drainage improvement, tie replacement, interlocking steel replacement, mud spot elimination, spot surfacing. This scope of work will take place between Ragan and Lorton.
FY22 Actual Expenditure & Accomplishments	\$36.3 M	The MAD South Track Program continued the implementation of track asset upgrades and modifications on PRIIA segments along the AP line between Philadelphia and Washington, DC. Continuous work of a reactive nature was performed on insulated joints, joint elimination, spot surfacing, spot undercutting, interlocking steel, lubricators, drainage improvements, plus timber and concrete ties. Improvements were also made at Perryville, Ivy City and Lorton Yards. Advancement on stand-alone construction projects include the completion of the Roadbed Stabilization project at MP 81.8 in Chase, Maryland; and the anticipated completion in Autumn 2022 of the Drainage Improvements at MP103.9 in Halethorpe, Maryland. Scope development continued on the Roadbed Stabilization project at MP 52.7 in North East, Maryland. This MAD South program will be combined with the former MAD North Track Program for FY23 and beyond. Efforts across multiple departments were coordinated to facilitate this action.
Variance & Explanation	\$11.2 M	This is the existing STIP Mid-Atlantic South Track Program whose Annual Operating Plan (AOP) budget began at \$23,378,185 at the outset of FY22. A change request was granted in June 2022 for an additional \$11,566,417, revising the FY22 AOP to \$34,944,602. Actual FY22 spending was \$34,001,077. This resulted in a total expenditure of 97.6% of the FY22 budget.
3. Next Generation Acela Infrastructure Upgrades: Baltimore Penn Station (Amtrak)		
FY22 Planned Expenditure & Scope	\$46.5 M	Continue BPS Track Reconfiguration, platforms 2 and 5 construction
FY22 Actual Expenditure & Accomplishments	\$29.8 M	Signals installed by C&S <input checked="" type="checkbox"/> Mobilization and start of Construction: Achieved Nov 2021 <input checked="" type="checkbox"/> Installation of S7 and S8 signals: Achieved Jul 2022 <input checked="" type="checkbox"/> Cat pole foundation finish: Achieved Sep 2022
Variance & Explanation	-\$16.7 M	Baseline realignment completed by WSP
4. Riverside Yard Heavy Maintenance Building (MDOT MTA / MARC)		
FY22 Planned Expenditure & Scope	\$36.6 M	Construction will perform 65% of the work in FY22
FY22 Actual Expenditure & Accomplishments	\$27.8 M	<ul style="list-style-type: none"> Drop Table System (DTS): Equipment start-up scheduled for 11/01/22, with Prefunctional Checks (PFC) on 11/02/22 and Site Acceptance Testing (SAT) on 11/03/22. Wheel Truing Machine (WTM): SAT successfully completed 10/06/22. Overhead Bridge Crane (OHBC): Installation complete Track Work: Track 2 concrete placement complete, embedded track installation in progress. Interior Work: Ongoing (plumbing, electrical, fire protection, etc.); Interior three-coat painting nearing completion. High impact floor installation beginning. Exterior Work: Northside concrete apron ongoing; Concrete apron work along south facade ongoing.
Variance & Explanation	-\$8.8 M	<ul style="list-style-type: none"> Design changes to the gas service. The final locations of the gas service manifold and required steel structure to carry the above ground gas piping required design modifications. Soil conditions required engineering and a new caisson to the scope of work and causing delayed project completion date. Track#1 installation delayed due to finish elevation of a portion of Track 1 concrete.

Investment detail including expenditures, accomplishments, and explanation of variances are published as submitted by agencies.

10 largest investments by FY22 actual expenditure, Mid-Atlantic South (cont.)

5. Washington Union Station: Subbasement Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$29.8 M	The Track 22 Reconstruction project contractor will install the new platform, walkway and canopy, and early track/ballast work. Contractor will prep work needed for elevator and escalator to be installed in early FY22. Amtrak Force account team to begin work to reconstruct OCS, Track, and Signals towards the end of the FY22. The Subbasement Structural Replacement project will continue to progress through final design and pre-construction activities. Stakeholder coordination will be ongoing during FY22 as precedent projects continue to develop in support of enabling construction. The Subbasement Utility Relocation Project will mitigate existing storage impacts by enabling Union Station Invesco (USI) to relocate back of house program to other areas in the Station. Union Station Redevelopment Corporation (USRC) will progress the design of substation and generator relocations to final design. USRC and USI will begin construction activities associated with the relocation of existing hydraulic pumps.
FY22 Actual Expenditure & Accomplishments	\$12.9 M	<p>Project activities associated with the Subbasement program continued to progress during FY22, albeit not at the speed that Amtrak would like due to space, ownership and control needs. These needs prompted the litigation discussed below. However, at the end of FY22, the Subbasement Structural Replacement Project design remained at 75%. Field activities in support of design work for S106 compliance and structural load rating for the Subbasement Structural Replacement Project were completed. Concept design for USI Back of House Relocation Project began during FY22 and will continue towards completion during FY23. Construction activities associated with Track 22 Reconstruction Project continued during the fiscal year with subsurface work and platform concrete work largely complete in FY22. No activity associated with USRC Utility Infrastructure relocation occurred.</p> <ul style="list-style-type: none"> ☑ Track 22 platform installed: Achieved Dec 2021 ☑ Track 22: Amtrak Temporary Catenary Removal: Achieved Apr 2022 ➡ Track 22: Remove Protective Barrier Track 22/23: <i>Now estimated Dec 2022</i> ➡ Subbasement Utility: Agreement with USI: <i>Now estimated Jan 2023</i> ➡ Subbasement Utility: Agreement with USRC/USI on Pumps: <i>Now estimated Jan 2023</i> ➡ Subbasement Utility: Agreement with USRC/USI on Sub/Gen: <i>Now estimated Jan 2023</i> ➡ Subbasement Structural: Final Rail Ops Plan: <i>Now estimated Feb 2023</i> ➡ Subbasement Structural: Bid Submission: <i>Now estimated Jul 2023</i> ➡ Subbasement Structural: Construction Submission: <i>Now estimated Aug 2024</i>
Variance & Explanation	-\$16.9 M	Track 22 Reconstruction project delay due to procurement and supply chain issues associated with vertical circulation elements for the project. Subbasement Structural Replacement project delay due to predecessor projects (USI Back of House and USRC Utility Infrastructure) which have not progressed due to required stakeholder coordination that has been paused, which has resulted in a delay of the remaining design completion. In FY21, Amtrak progressed the overall design of the Subbasement Structural Replacement project to 75% complete. The other 25% of the scope of work involves coordination with design elements of the aforementioned predecessor projects and cannot progress without advancement on those initiatives. During FY22, Amtrak has taken initiative to help progress the Back of House Relocation with concept design ideas for our stakeholders on back of house relocation. However, Amtrak has not been able to progress this work at the speed that it would like due to space, ownership and control needs. Amtrak, in April 2022, filed a condemnation action with the United States District Court for the District of Columbia in order to acquire certain leasehold interests in Washington Union Station in order to help progress the predecessor projects. The federal government currently leases the entirety of the station to the Union Station Redevelopment Corporation (USRC), USRC, in turn, subleased most of the station (except the parking garage) to Union Station Investco, LLC. The predecessor projects under those stakeholders have not been advanced as indicated above with the exception of the noted coordination on USI Back of House Relocation. Presently, the overall Subbasement Structural Replacement design tasks are on hold with the exception of railroad affected infrastructure such as OCS and C&S components.
6. Hanson Interlocking (Amtrak)		
FY22 Planned Expenditure & Scope	\$10.6 M	Design, permitting, property easement, utility coordination, construction, testing/commissioning, and closeout of a new electrified interlocking including an access road, four new crossovers with snow melters, CIH and A&B signal houses, RTU House, PTC wayside interface units, power distribution equipment and panels, interlocking lighting, duct bank/cable trough, communication and signal wiring, two new signal bridges, 44 catenary foundations and associated catenary structures, catenary wiring including sectionalizing, with ACSES, SCADA and CETC modifications to provide higher diverging speeds, operational flexibility, and improve reliability. Demolition of Landover Tower and removal of three existing crossovers at Landover Interlocking and modifications to the 91 switch.
FY22 Actual Expenditure & Accomplishments	\$11.9 M	<p>Completed the installation of 44 catenary poles (started in Sept FY21), 2 signal bridges, 22 k beams. Removed 33 catenary poles (including foundations). Replaced roughly 10,000' of static wire, 9000' of transmission line (3 phases) and 4000' of signal line (2 phases). Completed the 60 cycle power install from Pepco. C&S installed signals on the signal bridges (covered until cutover), installed signal and power cable, relays in huts, and terminated at huts, junction boxes and switch machines. ET completed 23 crosswire install, re-profiled track 2 and 3 catenary for k beam install, began switch install on poles and switch heater station installs.</p> <ul style="list-style-type: none"> ☑ Complete Catenary Pole Installation: Achieved Mar 2022 ☑ Complete install of all catenary structures (poles and K beams): Achieved May 2022 ☑ Complete installation of signal bridge structures (not including signals and signal cabling): Achieved Jul 2022 ➡ Remove existing catenary structures: <i>Now estimated Mar 2023</i>
Variance & Explanation	\$1.3 M	Most work on schedule. C&S Construction pulled off project in August for the most part as their crews had to move to the K Tower project for testing and cutover. C&S Construction scheduled to move back to Hanson in October 2022 with cutover in the first half of FY23. B&B electricians and ET forces are also working multiple projects but moving work forward at Hanson.

Investment detail including expenditures, accomplishments, and explanation of variances are published as submitted by agencies.

10 largest investments by FY22 actual expenditure, Mid-Atlantic South (cont.)

7. Baltimore Penn Station: Master Plan (Amtrak)		
FY22 Planned Expenditure & Scope	\$18.4 M	Continued design and construction for the Baltimore Penn Station Historic Headhouse Exterior Envelope work, moving into Core & Shell Construction and continued design development for the Station Expansion and Fit Out. Continued execution of enabling projects, program management support and lease executions.
FY22 Actual Expenditure & Accomplishments	\$11.3 M	<p>In FY22, the Baltimore program has achieved significant design milestone in terms of the completion of 100% design for the exterior envelope of the headhouse. The design for Headhouse Core and Shell, interior fitout and expansion of the station has significantly progressed and is at 60% design phase. Design efforts for enabling projects such as relocation of C&S facilities from the station to new locations to facilitate construction at the existing station and temporary facilities has also been started and already at 15%. Notice to proceed to the developer on construction of the exterior envelope was also issued this year and the construction progress is well underway.</p> <ul style="list-style-type: none"> ☑ NTP for SOGR Exterior Envelope Construction: Achieved Jan 2022 ➡ 60% Design Documentation for Station Expansion: Now estimated Aug 2023 ➡ Notice to Proceed for Station Expansion Construction: Now estimated Sep 2023 ➡ Complete Exterior Envelope Construction: Now estimated Dec 2023
Variance & Explanation	-\$7.1 M	The variance is mainly due to delayed start of construction of the Headhouse Exterior Envelope. Construction did not start in Q1 of FY22 as the lease agreement was in negotiations and was signed late in Q1. Notice to proceed for construction of exterior envelope was issued in early Q2.
8. Susquehanna River Bridge Replacement Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$11.5 M	Advance design to 60%
FY22 Actual Expenditure & Accomplishments	\$11.2 M	<ul style="list-style-type: none"> • Project restarted and Commence Final Design. • Contract Mod #14 for Early Action & NEPA reevaluation was executed for FY22. • Public Outreach & Stakeholder Agencies kick-off meeting was held with FRA, MTA/MDOT, WILMAPCO, City of Havre De Grace, Norfolk Southern, MARC, BG&E, and IKEA • Awarded Federal State-Partnership for State of Good Repair Grant Program (FY21). • Completed Labor Clearance for Demolition of Remnant Piers. • Completed Priority #1 Geotechnical Borings and Started Barge Priority #3 Borings and Priority 1B & 4A • Bridge Inspection was performed. • Project Delivery Workshop completed. Phase I procurement method will be CMAR. • Modified Track Alignment submitted 2/25 – reviewed and approved by Amtrak and reengaged with FRA • Early Action Packages Submissions: Package A (90%), Package B (100%), Package C (30%), Package D.2 (100%) <ul style="list-style-type: none"> ➡ Design Submission - Approach Structures - 60%: Now estimated Jun 2023 ➡ Design Submission - Main Structure - 60%: Now estimated Jun 2023 ➡ Design Submission - Track and Rail Systems (Signals, OCS, Comm) - 60%: Now estimated Jun 2023 ➡ Grace Interlocking Design (Precursor Activity) - 60%: Now estimated Jun 2023
Variance & Explanation	-\$0.3 M	There were no variances in FY22.
9. Mid-Atlantic South Catenary Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$5.1 M	Continuation of the SAP installation on Tracks 2 & 3, Switch heater upgrades and catenary wire replacements.
FY22 Actual Expenditure & Accomplishments	\$10.8 M	More than 770 SAPs installed. Upgraded/replacement Cat pole designs were completed including new foundations; foundations installed and steel procurement and orders placed.
Variance & Explanation	\$5.7 M	Project costs and schedule variances were a result of supply chain delays including steel supply, procurement and workforce shortages. Additionally there were issues in managing the budget to account for a projected expense of approximately \$2.8MM in as a result of the derailment. The field charges resulted in nearly \$5MM that we were not consulted about, only informed of after the fact, which resulted in our being over budget.
10. Next Generation Acela Infrastructure Upgrades: Ivy City Yard (Amtrak)		
FY22 Planned Expenditure & Scope	\$0	No planned activity in FY22
FY22 Actual Expenditure & Accomplishments	\$5.9 M	<p>IWW installed.</p> <ul style="list-style-type: none"> ☑ Construction Completion S&I Modifications: Achieved Mar 2022 ☑ Completion of Industrial Waste Water: Achieved Sep 2022
Variance & Explanation	\$5.9 M	Change request created to capture additional budget increases.

Investment detail including expenditures, accomplishments, and explanation of variances are published as submitted by agencies.

All Mid-Atlantic South investments by submitting agency

Investment Name	FY22 Planned Expenditure	FY22 Actual Expenditure	Variance
Amtrak			
Aberdeen, MD High Level Platforms Project	\$0	\$0.0 M	\$0.0 M
B&P Tunnel Replacement Program	\$46.7 M	\$43.2 M	-\$3.6 M
Baltimore Penn Station: Master Plan	\$18.4 M	\$11.3 M	-\$7.1 M
BWI 4th Track Phase 1	\$0	\$0	\$0
ENV 900 2ND ST WAS DC UST AREA-GROUNDWATER/SOIL REMEDIATION	\$0	\$0.0 M	\$0.0 M
Gunpow Substation 18 New Prefabricated Control House	\$0.7 M	\$0.3 M	-\$0.5 M
Hanson Interlocking	\$10.6 M	\$11.9 M	\$1.3 M
Intercity Trainset (ICT) Maintenance Facilities: Ivy City Yard	\$0	\$0.9 M	\$0.9 M
Ivy City Potable Water System Replacement Project	\$8.9 M	\$0.1 M	-\$8.8 M
Ivy City Remediation	\$0.1 M	\$0.1 M	-\$0.0 M
Jericho Park Frequency Converter Replacement	\$1.5 M	\$0.0 M	-\$1.5 M
MARC Martin's Yard: Power-Operated Switch	\$0.8 M	\$0	-\$0.8 M
Maryland Section Reliability Improvements	\$0	\$0.0 M	\$0.0 M
Mid-Atlantic South Catenary Program	\$5.1 M	\$10.8 M	\$5.7 M
Mid-Atlantic South Facilities Program	\$4.0 M	\$0.9 M	-\$3.2 M
Mid-Atlantic South Signal System Upgrades to 562 Project	\$8.4 M	\$0.4 M	-\$8.1 M
Mid-Atlantic South Signals Program	\$1.1 M	\$1.1 M	\$0.0 M
Mid-Atlantic South Structures Program	\$7.3 M	\$3.2 M	-\$4.1 M
Mid-Atlantic South Substations Program	\$1.7 M	\$1.5 M	-\$0.2 M
Mid-Atlantic South Track Program	\$25.1 M	\$36.3 M	\$11.2 M
New Carrollton Station: State of Good Repair Improvements	\$0.8 M	\$0.2 M	-\$0.5 M
Next Generation Acela Infrastructure Upgrades: Baltimore Penn Station	\$46.5 M	\$29.8 M	-\$16.7 M
Next Generation Acela Infrastructure Upgrades: Ivy City Yard	\$0	\$5.9 M	\$5.9 M
Next Generation Acela Infrastructure Upgrades: New Carrollton Station	\$1.7 M	\$1.4 M	-\$0.3 M
Penn Coach Yard & Ivy City Track Pan Upgrades	\$0.3 M	\$0	-\$0.3 M
STA NEW CARROLLTON MD - ELEVATOR/ESCALATORS REPLACEMENT	\$0	\$0.9 M	\$0.9 M
Susquehanna River Bridge Replacement Program	\$11.5 M	\$11.2 M	-\$0.3 M
Washington DC Handrail and Stair Improvements	\$0.3 M	\$0	-\$0.3 M
Washington DC Metropolitan Lounge Refresh	\$0	\$0.0 M	\$0.0 M
Washington DC Platform 16/17 Refresh	\$1.5 M	\$0	-\$1.5 M
Washington DC Platform Emergency Lighting	\$0.2 M	\$0.0 M	-\$0.2 M
Washington DC Refresh Program	\$0	\$0.2 M	\$0.2 M
Washington Terminal & Ivy City Facility Electrical Upgrades Project	\$3.0 M	\$0.0 M	-\$3.0 M
Washington Union Station Hi-Level Platform Refresh	\$0.4 M	\$1.5 M	\$1.2 M
Washington Union Station: Claytor Concourse Modernization Program	\$8.7 M	\$1.2 M	-\$7.5 M
Washington Union Station: Long Term Station Expansion	\$11.9 M	\$5.7 M	-\$6.2 M

All Mid-Atlantic South investments by submitting agency (cont.)

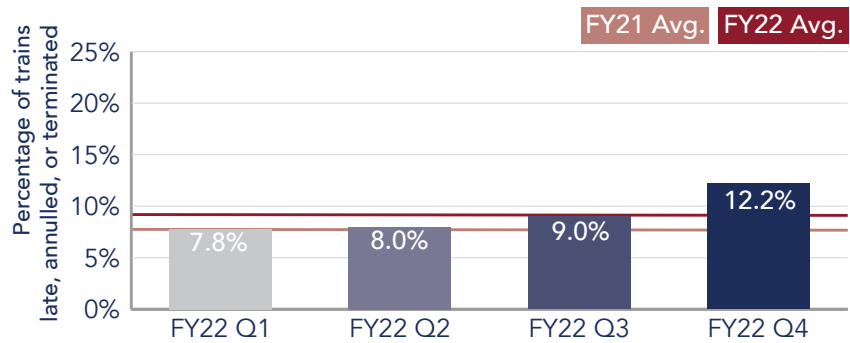
Investment Name	FY22 Planned Expenditure	FY22 Actual Expenditure	Variance
Washington Union Station: Near Term Rail Program	\$5.8 M	\$0.5 M	-\$5.3 M
Washington Union Station: Subbasement Program	\$29.8 M	\$12.9 M	-\$16.9 M
MDOT MTA / MARC			
MARC Martin's Yard: Storage Improvements	\$6.9 M	\$0.1 M	-\$6.9 M
Penn-Camden Connector	\$0.6 M	\$0.5 M	-\$0.1 M
Riverside Yard Heavy Maintenance Building	\$36.6 M	\$27.8 M	-\$8.8 M
VRE			
VRE Midday Storage Facility	\$0.5 M	\$0.0 M	-\$0.5 M

Operations: MARC

MARC's Penn Line service operates entirely on the NEC Main Line between Perryville, MD and Washington Union Station, while the Camden and Brunswick services operate on CSX lines that connect to the NEC at "C" Interlocking, just north of Washington Union Station.

Train performance profile

Metric	FY21	FY22
Percent NEC trains late, annulled, or terminated	7.9%	9.3%
Percent NEC trains not completed	0.96%	1.4%
Avg min late per NEC train	22.9	18.2

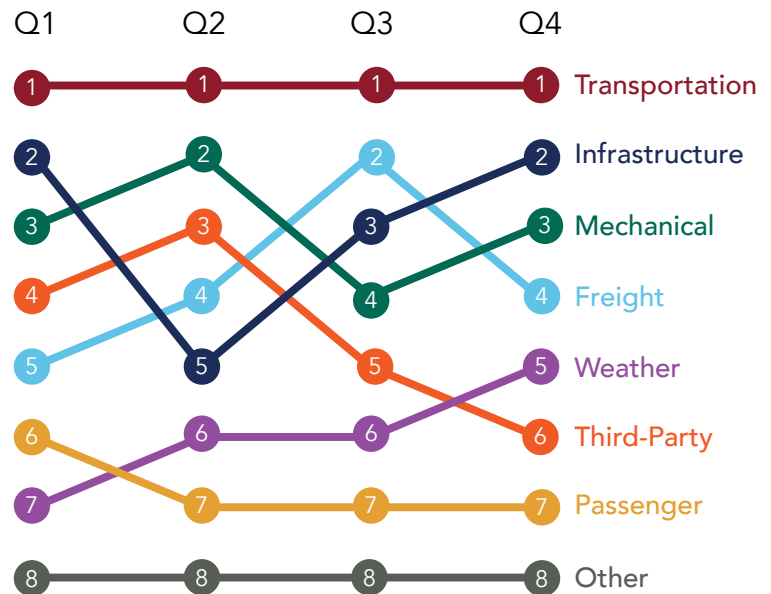


Train-delay minutes by cause

Total and percent change, FY21-22

Cause	FY21	FY22	Change
Infrastructure	5,623	12,297	+118.7%
Mechanical	6,331	8,076	+27.6%
Transportation	12,670	28,562	+125.4%
Passenger	607	929	+53.0%
Weather	1,720	3,419	+98.8%
Third-Party	1,056	5,744	+443.9%
Freight	2,604	7,489	+187.6%
Other	-	-	-
Total	30,611	66,516	+117.3%

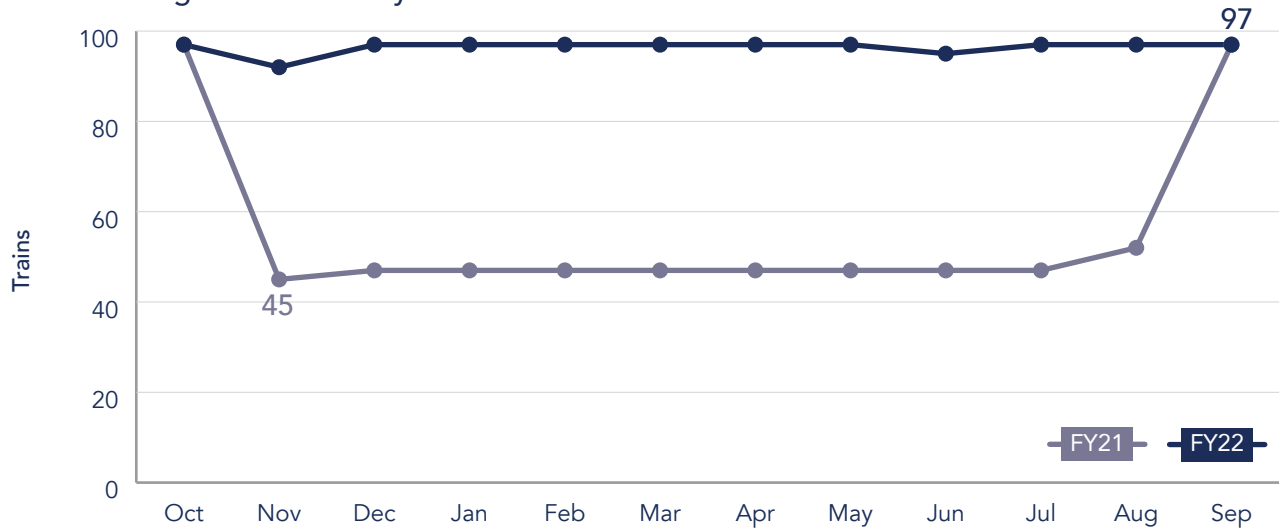
Rank by category, FY21



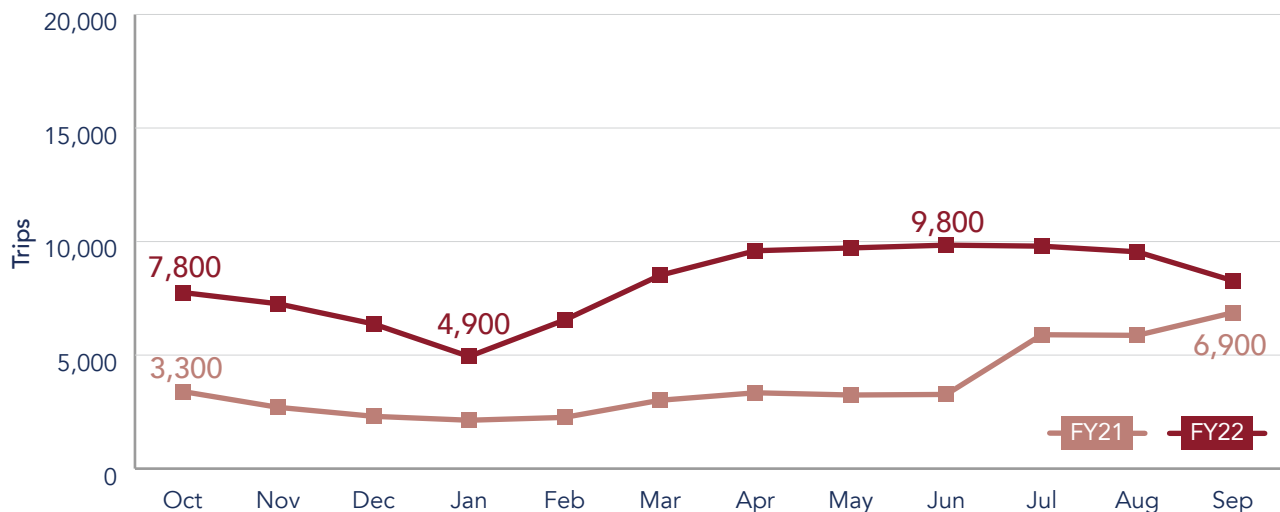
MARC NEC Service and Ridership

Period	Average Weekday NEC Trains			Average Weekday NEC Trips		
	FY20	FY21	Change from FY20	FY20	FY21	Change from FY20
Q1 (Oct - Dec)	97	64	-34% ↑	28,946	2,799	-90% ↓
Q2 (Jan - Mar)	91	47	-48% ↓	25,689	2,465	-90% ↓
Q3 (Apr - Jun)	37	47	+28% ↓	1,278	3,283	+157% ↑
Q4 (Jul - Sep)	89	65	-27% ↓	2,931	4,281	+46% ↑
FY Average (Oct - Sep)	78	56	-29% ↓	14,711	3,207	-78% ↓

MARC Average NEC Weekday Trains



MARC Average NEC Weekday Trips

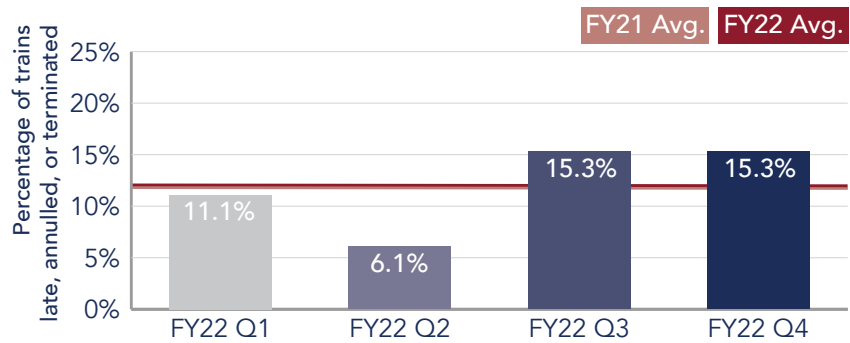


Operations: VRE

VRE operates two commuter lines out of Washington Union Station to Manassas, VA over NS track and Fredricksburg, VA over CSX track. Both lines operate on a segment of the NEC Main Line just south of Washington Union Station.

Train performance profile

Metric	FY21	FY22
Percent NEC trains late, annulled, or terminated	11.8%	11.9%
Percent NEC trains not completed	0.09%	0.00%
Avg min late per NEC train	17.1	19.3

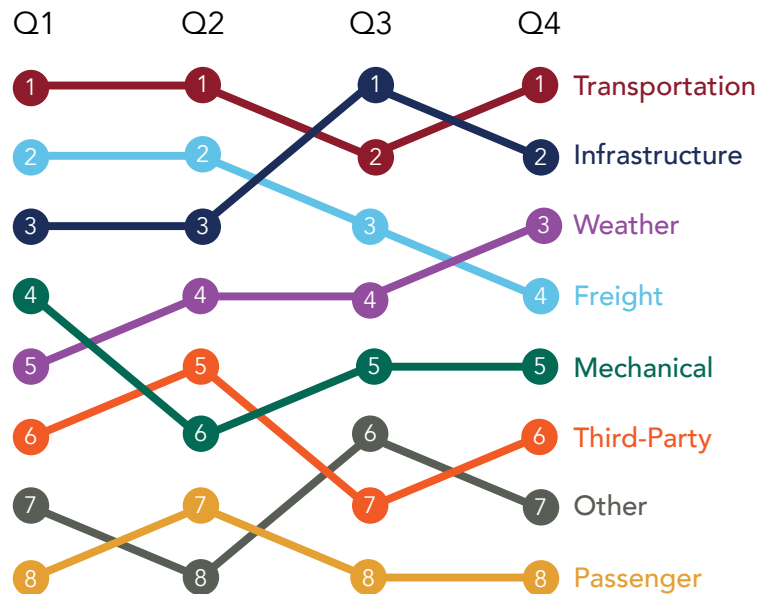


Train-delay minutes by cause

Total and percent change, FY21-22

Cause	FY21	FY22	Change
Infrastructure	3,051	4,891	+60.3%
Mechanical	501	1,135	+126.5%
Transportation	5,184	7,325	+41.3%
Passenger	923	38	-95.9%
Weather	390	1,975	+406.4%
Third-Party	2,861	325	-88.6%
Freight	139	4,190	+2,914.4%
Other	-	140	-
Total	13,049	20,019	+53.4%

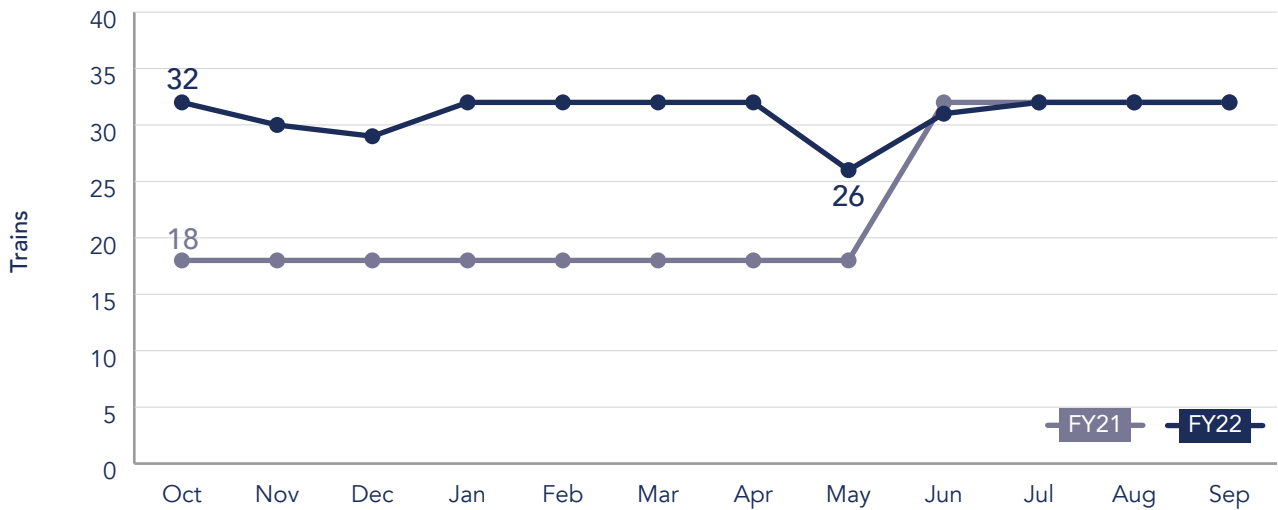
Rank by category, FY21



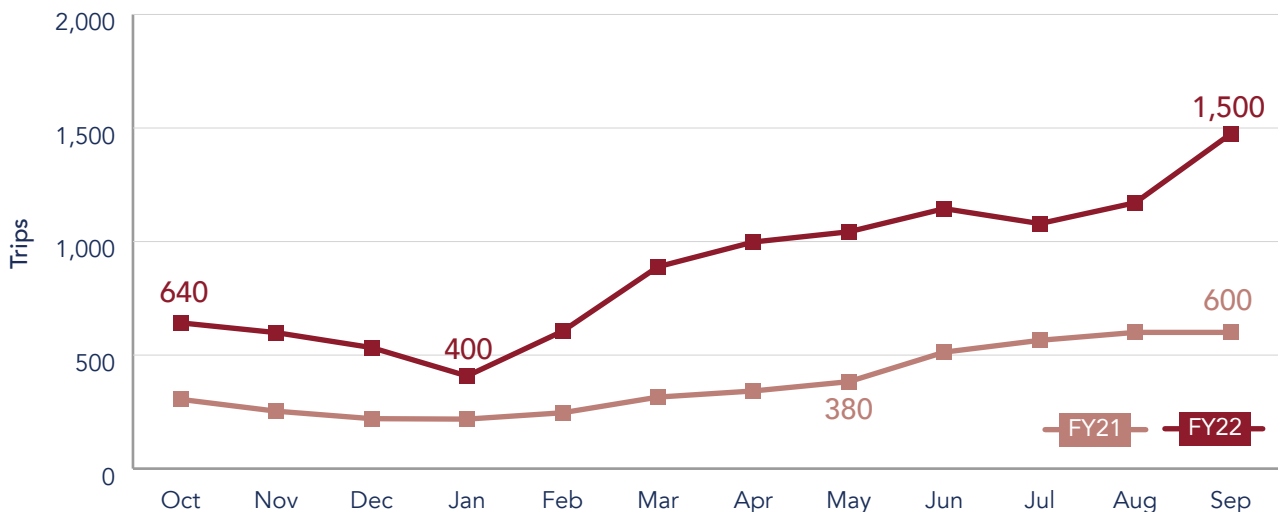
VRE NEC Service and Ridership

Period	Average Weekday NEC Trains			Average Weekday NEC Trips		
	FY21	FY22	Change from FY21	FY21	FY22	Change from FY21
Q1 (Oct - Dec)	18	30	+68% ↑	259	591	+128% ↑
Q2 (Jan - Mar)	18	32	+78% ↑	260	634	+144% ↑
Q3 (Apr - Jun)	23	30	+32% ↑	413	1,062	+157% ↑
Q4 (Jul - Sep)	32	32	0%	588	1,241	+111% ↑
FY Average (Oct - Sep)	23	31	+37% ↑	380	882	+132% ↑

VRE Average NEC Weekday Trains



VRE Average NEC Weekday Trips



Region: Amtrak System-wide

Infrastructure and Operations Detail

Operators: Amtrak

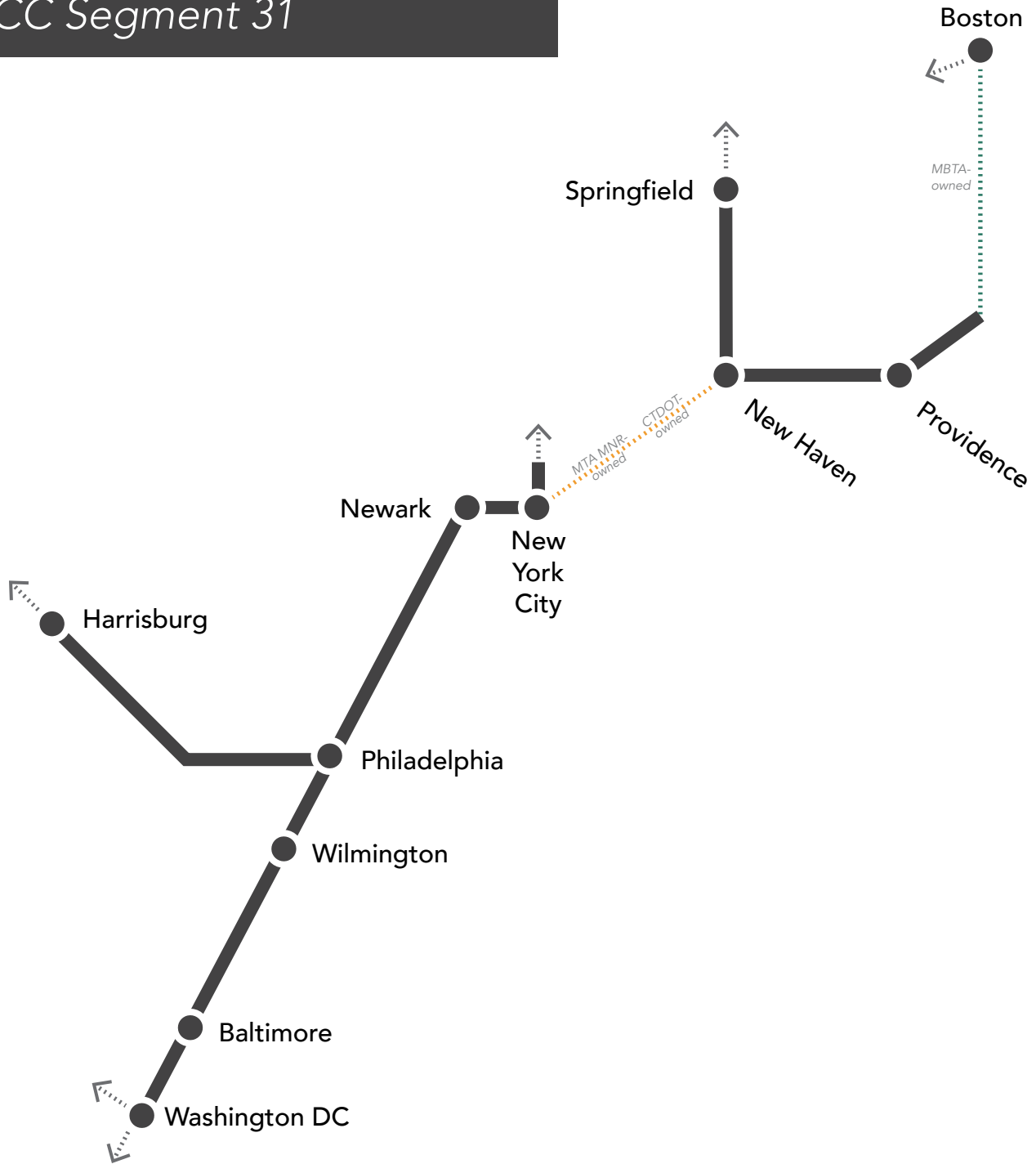
RoW Owner: Amtrak

BCC Segments

31: Amtrak System-wide

Amtrak System-wide

BCC Segment 31



Not all intermediate stations shown.

Segment 31 comprises of capital renewal investments that cannot be tied to a specific location and have benefits throughout the Amtrak-owned portion of the NEC.

- Amtrak-owned
- Non Amtrak-owned
- Non-NEC Connecting Corridors

Infrastructure

Some Amtrak investments span multiple regions or are non-geographically specific. These investments are represented in this Amtrak System-wide region. In total, \$78 million was invested in these investments in FY22 (56% of plan).

10 largest investments by FY22 actual expenditure, Amtrak System-wide

1. Turnout Renewal Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$74.0 M	In FY22, our Switch Exchange System production group will replace the #34 crossover at Lehigh Interlocking, the #32, #23, and #E21 crossovers at Mantua Interlocking, the #17 and #9 crossovers at Overbrook Interlocking, the #12, #21, and #W32 crossovers at Girard interlocking, the #127 and #125 crossovers and #123 turnout at Dock Interlocking, and the #W43 crossover at Elmora Interlocking. Our Independent Track South Production group will finish the replacements and associated trackwork at Thorn Interlocking and replace the #12, #23, and #34 crossovers at Baldwin Interlocking, the #12 crossover at Biddle Interlocking, and the #61, #67, and #76 crossovers and #43, and #87 turnouts at Paul Interlocking. In addition, the New England division forces will replace the #21 crossover at Branford Interlocking, the #21 crossover at Lawn Interlocking, the #21 crossover at Orms Interlocking, and the #12 and #21 crossovers on the Empire Line at CP124.
FY22 Actual Expenditure & Accomplishments	\$63.9 M	<p>Over all this program was able to install 47 of the planned 52 Turnouts for FY22. List of installed locations below:</p> <ul style="list-style-type: none"> • C.EN.101860.0091 TURN LAWN I/L #21 X/O - INSTALL • C.EN.101860.0169 TURN PAUL I/L #61A T/O-INSTALL • C.EN.101860.0174 TURN PAUL I/L #61B T/O-INSTALL • C.EN.101860.0226 TURN THORN I/L #51 A T/O - INSTALL • C.EN.101860.0234 TURN MANTUA I/L #21E X/O-INSTALL • C.EN.101860.0239 TURN MANTUA I/L #23 X/O-INSTALL • C.EN.101860.0244 TURN MANTUA I/L #32 X/O-INSTALL • C.EN.101860.0275 TURN LEHIGH I/L #34 X/O-INSTALL • C.EN.101860.0280 TURN LEHIGH I/L #23 X/O-INSTALL • C.EN.101860.0297 TURN ODENTON MD-YARD TK1 RENEWAL • C.EN.101860.0346 TURN DOCK I/L #125 X/O-INSTALL • C.EN.101860.0361 TURN DOCK I/L #123 T/O-INSTALL • C.EN.101860.0371 TURN BALDWIN I/L #12 X/O-INSTALL • C.EN.101860.0376 TURN BALDWIN I/L #23 X/O-INSTALL • C.EN.101860.0381 TURN BALDWIN I/L #34 X/O-INSTALL • C.EN.101860.0386 TURN GIRARD I/L #12 X/O-INSTALL • C.EN.101860.0391 TURN GIRARD I/L #21 X/O-INSTALL • C.EN.101860.0396 TURN GIRARD I/L #W32 X/O-INSTALL • C.EN.101860.0401 TURN OVERBROOK I/L #17 X/O-INSTALL • C.EN.101860.0406 TURN OVERBROOK I/L #9 X/O-INSTALL • C.EN.101860.0411 TURN PAUL I/L #67 X/O - INSTALL • C.EN.101860.0416 TURN BIDDLE I/L #12 X/O-INSTALL • C.EN.101860.0421 TURN PAUL I/L #76 X/O - INSTALL * • C.EN.101860.0440 TURN PAUL I/L #43 T/O - INSTALL • C.EN.101860.0445 TURN PAUL I/L #87 T/O - INSTALL • C.EN.101860.0450 TURN PAUL I/L #36 T/O - INSTALL • C.EN.101860.0470 TURN GUNPOW I/L #23A TO-INSTALL • C.EN.101860.0475 TURN GUNPOW I/L #32 X/O-INSTALL • C.EN.101860.0480 TURN GUNPOW I/L #92 TO-INSTALL • C.EN.101860.0291 TURN ORMS I/L #21 X/O INSTALL <p>* 1 of 2 turnouts installed</p>
Variance & Explanation	-\$10.1 M	<p>The following install were pushed into FY23 at the mid point September 2022.</p> <ul style="list-style-type: none"> • C.EN.101860.0421 TURN PAUL I/L #76 X/O - INSTALL * • C.EN.101860.0450 TURN PAUL I/L #36 T/O - INSTALL • C.EN.101860.0430 TURN "K" I/L DIAMOND CROSSING - INSTALL • C.EN.101860.0291 TURN ORMS I/L #21 X/O INSTALL <p>* 1 of 2 turnouts installed</p>

Investment detail including expenditures, accomplishments, and explanation of variances are published as submitted by agencies.

10 largest investments by FY22 actual expenditure, Amtrak System-wide (cont.)

2. Engineering Major Equipment Acquisition (Amtrak)		
FY22 Planned Expenditure & Scope	\$155.1 M	Continue overseeing multi year procurement, fabrication and delivery of MoW Equipment including but not limited to switch tampers, undercutting machines, track laying machines, stabilizers, tampers, Brandt trucks, ballast cars, side dump cars, flat cars, and material hopper conveyor cars along with begin fabrication of TLM, BMS and railbound tunnel crane.
FY22 Actual Expenditure & Accomplishments	\$52.2 M	Marginally exceeded overall revised budget target of \$47.30M . Open POs: \$60.71 with deliveries up to Apr 2025.
Variance & Explanation	-\$102.9 M	Supply chain-related delays have pushed back equipment delivery dates.
3. TLS Concrete Tie Replacement Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$41.9 M	FY22 the following work will be consist of performing complete renewal of concrete tie and continuous welded rail for aging infrastructure that is at end of life between Bacon to Prince (Track 3) AP Line 51 to AP Line 57.1 and Oak to Bush (Track 4) AP Line 63.1 to AP Line 71.5
FY22 Actual Expenditure & Accomplishments	\$34.0 M	In FY'22, the TLS workgroup installed over 28,406 concrete ties and over 112,000 CWR ft of rail. This total includes work completed on Track 3 between Bacon and Prince (AP Line) and on Track A between Elmora and Union (AN Line).
Variance & Explanation	-\$7.8 M	In FY'22, the TLS workgroup installed 28,406 concrete ties and over 112,000 CWR. --vs-- ECR Revised Scope of 27,165 concrete ties and 108,663 Ft. CWR. The TLS completed 105% ECR adjusted scope. // Original FY'22 baseline scope was 37,831 concrete ties and 151,325 Ft. CWR. The TLS completed 75% of original baseline scope.
4. Next Generation Acela Infrastructure Upgrades: Safety Mitigation (Amtrak)		
FY22 Planned Expenditure & Scope	\$27.7 M	The installation of fencing, and guard rails at select locations on the NEC, per Tier III FRA Waiver. Installation of intrusion mitigation fencing and guiderail installation at 18 locations on the NEC and other work required.
FY22 Actual Expenditure & Accomplishments	\$23.1 M	<ul style="list-style-type: none"> SAFE PROT: Installation of a split point derail on approach track, and associated C&S equipment along with track surfacing where required. The only current location is the Framingham Lead in Mansfield, MA at (MP204.1). PTSO: Purchased all the equipment to install on the New Acela Fleet and preparation for the installation work. MOW LCCAS: Purchased a large majority of the hardware necessary to install on the MOW Equipment. Finalized the back office design for the systems. <ul style="list-style-type: none"> <input checked="" type="checkbox"/> PTSO: NTP A/E Task Order to Create Technical Document: Achieved Nov 2021 <input checked="" type="checkbox"/> PTSO: NTP Solution for PTSO Agreement: Achieved Nov 2021 <input checked="" type="checkbox"/> SAFE PROT: Install Split Point Derail on Framingham Lead: Achieved Apr 2022
Variance & Explanation	-\$4.6 M	Project work complete per schedule. There were no major variances.
5. Production Wood Tie/Timber Replacement Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$15.5 M	The FY22 scope of this program is the replacement of wood ties and timbers at the following locations: On the Harrisburg Line Rheems to State, on the AP Line Washington Union Station, Overbrook, Brandy to Wine and Bell to Landlith, Landover, Grove, Winans to Bridge, and Lorton Auto Train facility in Virginia; On the Springfield Line between Windsor and Spring; on the Empire Line between MP 142 and 169; On the AN Line between Elmora and Union.
FY22 Actual Expenditure & Accomplishments	\$20.4 M	The program stayed on track this FY, the sole gang working on this program stayed on the same location/line and completed previously planned scope, regardless of personnel, weather or equipment issues.
Variance & Explanation	\$4.8 M	FY22 scope did not continue onto FY23 scope due to supporting as head-end gang for the TLS program, and continuing division related clean up work. We are in the middle of re-scoping this program per tech data of bad ties.
6. Production High Speed Surfacing Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$16.7 M	FY22 the following work will be performed: Start Interlockings and track segments on the following lines AB, AP, AH, AN, AR and AZ. Start undercutter settlement surfacing and dropping new stones as needed and track raises.
FY22 Actual Expenditure & Accomplishments	\$19.5 M	We were able to stay on program for most of the year with some deviations to support post-installation work that were critical to the safety and integrity of the ride quality.
Variance & Explanation	\$2.8 M	Variances included severe deviations caused by both division safety-related requests or production post-install work.

Investment detail including expenditures, accomplishments, and explanation of variances are published as submitted by agencies.

10 largest investments by FY22 actual expenditure, Amtrak System-wide (cont.)

7. Rail Replacement Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$12.2 M	<p>This FY22 program will replace the highest critical continuous welded rail (CWT) or curve patch first. The following FY22 work will be performed:</p> <ul style="list-style-type: none"> The curve patch locations on the NY Line include: - Replacing rail at MP 26.39, and at MP 24.69. The rail on the AZ Line includes: - Replacing rail on the low sided rail on track #2 at Bergen, and Replacing rail on the low sided rail on track #3 at Bergen. On the AB Line the FY 22 planned list includes: Replacing rail at: NED AB Line: Groton(MP124.2) to High Street (MP142.9). – Replacing rail on the NED AB Line: Cranston (MP181.2) to Atwells (MP184.2). – Replacing rail between Atwells (MP184.2) to ORMS (MP185.6).
FY22 Actual Expenditure & Accomplishments	\$11.9 M	<p>For FY22, the original Rail Replacement Program planned to install approximately 107,650 ft. of “New CWR” on the AB, AN, and AP Lines, and replace 72,000 ft of “fit” rail on the AS Line. All of the AB line (NED) elements were completed and 1 AN Line (New York) element was completed for a total of over 71,000. of “New CWR”. The elements in Perryville and Baltimore (AP Line) were cancelled. The rest of the elements on the AP, AN and AS Line were deferred to FY23.</p>
Variance & Explanation	-\$0.3 M	<p>The gang worked more efficiently than planned, so their budget was not completely spent. The AN Line (New York) element that was completed installed 922 ft. of “New CWR”. (The original plan was to install 1,050 ft. of “New CWR” but the original surveyor didn’t measure correctly.) The elements in Perryville and Baltimore (AP Line) were cancelled. The rest of the elements on the AP, AN and AS Line were deferred to FY23.</p>
8. Track Undercutting Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$23.1 M	<p>Out-of-face Undercutting between Bacon to Prince (Tk 3) and Oak to Bush (Tk 4). In total, approximately 75,500' of track will be undercut in FY'22.</p>
FY22 Actual Expenditure & Accomplishments	\$11.3 M	<p>In FY'22, the Undercutting workgroup performed 21,101 Ft Undercutting. This total includes work completed on Track 3 between Bacon and Prince (AP Line), on Track 4 between Grace and Oak (AP Line), and on Track 2 between Prince and Perry (AP Line).</p>
Variance & Explanation	-\$11.8 M	<p>In FY'22, the Undercutting workgroup performed 21,101 Ft Undercutting --vs-- Original FY'22 baseline scope of 75,662 Ft Undercutting. The Undercutting workgroup completed 28% of original baseline scope.</p>
9. Amtrak Owned Positive Train CTRL (PTC) Installation Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$11.6 M	<p>FY22 will focus on increased functionality to the on-board computer system such as the Boxcars Technology and Back to Back technology, upgrades to communications systems to make them compatible with PTC, upgrades to the back office systems and wayside upgrades associated with increased functionality technology.</p>
FY22 Actual Expenditure & Accomplishments	\$10.6 M	<p>FY22 work focused on increased functionality to the on-board computer system such as the Boxcars Technology and Back to Back technology, upgrades to communications systems to make them compatible with PTC, upgrades to the back office systems and wayside upgrades associated with increased functionality technology. WIU location improvements included: CP Newark, Zoo, Line7 Rev 16 Line9 (Hudson).</p>
Variance & Explanation	-\$0.9 M	<p>Contractor was delayed due to staffing and equipment issues during 2 of the 4 quarters of FY22 causing a variance in budget and schedule. The plan for FY23 is to increase production to make up for deficits in schedule.</p>
10. Fence Upgrades Program (Amtrak)		
FY22 Planned Expenditure & Scope	\$14.8 M	<p>In FY22 fencing will be installed in a significant number of locations across the Northeast Corridor (NEC). Work will be done in the following locations in FY22:</p> <ul style="list-style-type: none"> In the New England Division, we are installing fencing in Pawtucket, Niantic, East Greenwich, Branford, Wallingford, New London and a few other locations. In the New York Division, we are installing fencing in the Bronx, Metuchen and Elizabeth. In the Mid-Atlantic Division, we are installing fencing in Parkesburg and Baltimore.
FY22 Actual Expenditure & Accomplishments	\$9.9 M	<ul style="list-style-type: none"> New England Division – Pawtucket, RI – work complete; E. Greenwich, RI – work complete; New London, CT – work complete; Stonington, CT - work complete; New York Division - Bronx, NY – work complete; Metuchen (TK1), NJ – work complete; Metuchen (TK4), NJ – work complete; Elizabeth, NJ – phase 1 work complete; New Brunswick, NJ work complete. Mid-Atlantic Division– Baltimore, MD – work complete; Parkesburg, PA - work complete. Chester, PA – work complete.
Variance & Explanation	-\$5.0 M	<p>Work was suspended in multiple locations due to pending NEPA evaluations</p>

Investment detail including expenditures, accomplishments, and explanation of variances are published as submitted by agencies.

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Content continues on next page.

All Amtrak System-wide investments

Investment Name	FY22 Planned Expenditure	FY22 Actual Expenditure	Variance
Amtrak			
ACELA 21 Electric Traction Load Flow Study	\$0.1 M	\$0.1 M	\$0.0 M
AEI Tag Reader Wayside Defect Detection	\$1.4 M	\$0.4 M	-\$1.0 M
Amtrak NEC Nortrak Operating Rods Replacement Project	\$1.0 M	\$0.3 M	-\$0.6 M
Amtrak Owned Positive Train CTRL (PTC) Installation Program	\$11.6 M	\$10.6 M	-\$0.9 M
Amtrak Station Signage Upgrades	\$0	\$0.1 M	\$0.1 M
Asbestos, Lead Paint, and Mold Removal	\$0	\$0.2 M	\$0.2 M
Bridges & Tunnels Security Enhancements	\$0	\$0.2 M	\$0.2 M
Communications System Upgrades Program	\$7.2 M	\$4.2 M	-\$3.0 M
Electric Traction System Aerial System Assessment Project	\$2.4 M	\$1.2 M	-\$1.2 M
Engineering Advanced Technology Track Inspection Program	\$1.3 M	\$2.7 M	\$1.4 M
Engineering Asset Management System	\$3.8 M	\$8.8 M	\$5.0 M
Engineering Capital Program/Project Management	\$15.0 M	\$8.5 M	-\$6.5 M
Engineering Equipment Acquisition Program	\$22.8 M	\$9.3 M	-\$13.6 M
Engineering Equipment Heavy Overhaul Program	\$9.7 M	\$3.6 M	-\$6.1 M
Engineering Major Equipment Acquisition	\$155.1 M	\$52.2 M	-\$102.9 M
Engineering Vehicle Acquisition Program	\$4.4 M	\$1.4 M	-\$3.0 M
ET Linear Assets Research and Development Program	\$3.5 M	\$1.5 M	-\$1.9 M
Fence Upgrades Program	\$14.8 M	\$9.9 M	-\$5.0 M
High Speed Adjacent Track Signage	\$1.4 M	\$0	-\$1.4 M
Maintenance Facility Security Enhancements	\$0	\$0.0 M	\$0.0 M
Mid-Atlantic AMTEC Upgrades	\$0	\$3.0 M	\$3.0 M
NEC Trip Time Reduction	\$1.8 M	\$1.0 M	-\$0.8 M
Next Generation Acela Infrastructure Upgrades: Ride Quality Improvement	\$4.5 M	\$1.0 M	-\$3.5 M
Next Generation Acela Infrastructure Upgrades: Safety Mitigation	\$27.7 M	\$23.1 M	-\$4.6 M
Next Generation Acela Infrastructure Upgrades: Tier III Waiver Gates	\$0	\$7.8 M	\$7.8 M
Passenger Information Display Systems Program (PIDS)	\$0	\$0.5 M	\$0.5 M
Production High Speed Surfacing Program	\$16.7 M	\$19.5 M	\$2.8 M
Production Wood Tie/Timber Replacement Program	\$15.5 M	\$20.4 M	\$4.8 M
Radio Infrastructure Upgrades Project	\$2.2 M	\$2.2 M	-\$0.0 M
Rail Grinding Program (Amtrak)	\$6.8 M	\$5.9 M	-\$0.9 M
Rail Replacement Program	\$12.2 M	\$11.9 M	-\$0.3 M
Rolling Stock Heavy Overhaul Program	\$2.5 M	\$1.4 M	-\$1.0 M
STA STATIONS CUSTOMER FACING IMPROVEMENTS	\$0	\$1.1 M	\$1.1 M
Static Sign Standard Manual Upgrades	\$1.4 M	\$0.1 M	-\$1.3 M
Stations Systemwide Escalator Safety Initiative - PM	\$0.4 M	\$0	-\$0.4 M
TLS Concrete Tie Replacement Program	\$41.9 M	\$34.0 M	-\$7.8 M

All Amtrak System-wide investments (cont.)

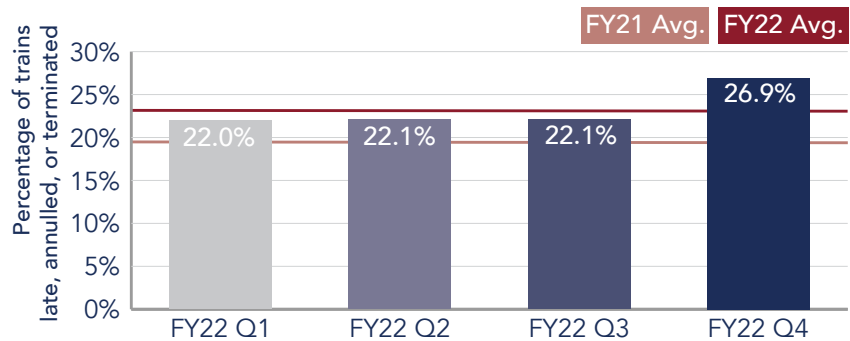
Investment Name	FY22 Planned Expenditure	FY22 Actual Expenditure	Variance
Track Rehabilitation Program	\$4.6 M	\$4.3 M	-\$0.3 M
Track Undercutting Program	\$23.1 M	\$11.3 M	-\$11.8 M
Turnout Renewal Program	\$74.0 M	\$63.9 M	-\$10.1 M
UV Sanitization - Elevator Cab	\$0.8 M	\$0	-\$0.8 M

Operations: Amtrak

Amtrak operates intercity service on along the NEC Main Line between Boston, MA and Washington D.C. and on the three NEC Branch Lines to Springfield, MA, Spuyten Duyvil, NY, and Harrisburg, PA. Amtrak's Northeast Regional, Acela, Hartford Line, and Keystone Services routes operate entirely on the NEC main and branch lines and several state-supported and long distance routes operate on sections of the NEC.

Train performance profile

Metric	FY21	FY22
Percent NEC trains late, annulled, or terminated	19.14%	23.4%
Percent NEC trains not completed	0.27%	0.28%
Avg min late per NEC train	60.3	62.8

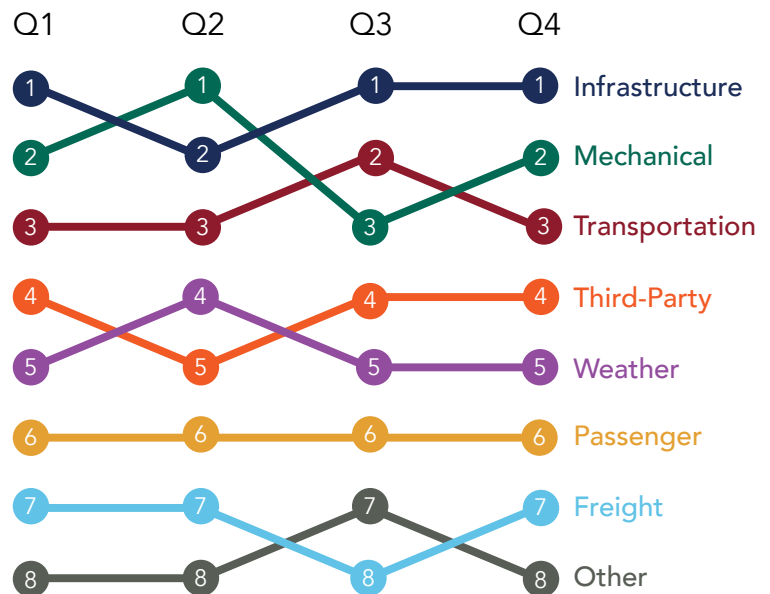


Train-delay minutes by cause

Total and percent change, FY21-22

Cause	FY21	FY22	Change
Infrastructure	40,860	75,886	+85.7%
Mechanical	33,780	72,623	+115.0%
Transportation	28,729	60,984	+112.3%
Passenger	11,773	24,354	+106.9%
Weather	16,771	33,277	+98.4%
Third-Party	22,073	41,433	+87.7%
Freight	3,314	5,419	+63.5%
Other	2,396	3,247	+35.5%
Total	159,696	317,223	+98.6%

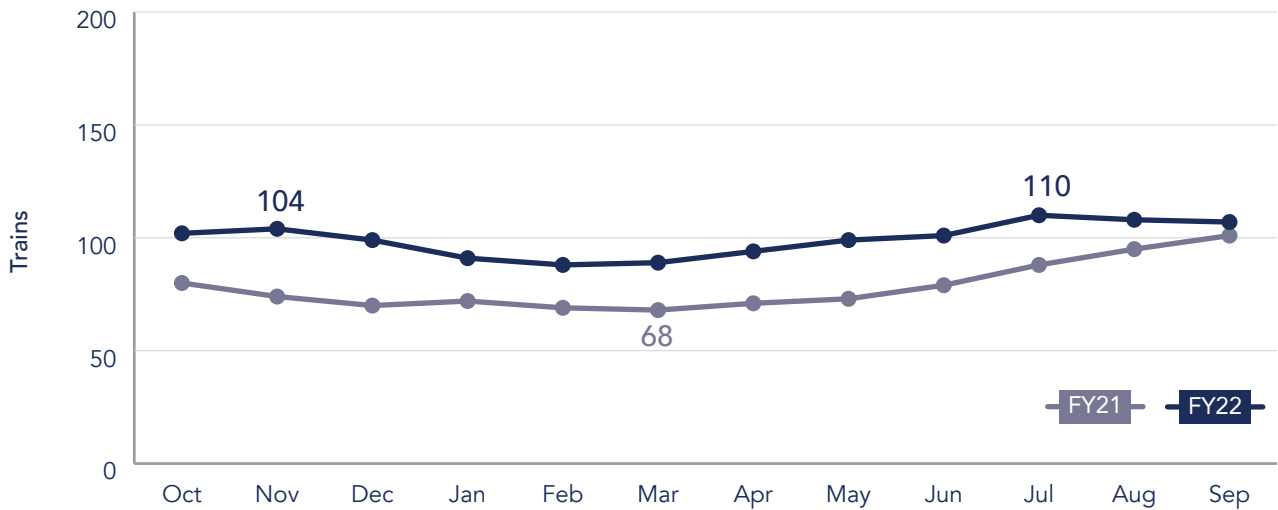
Rank by category, FY21



Amtrak NEC Service and Ridership

Period	Average Weekday NEC Trains			Average Weekday NEC Trips		
	FY21	FY22	Change from FY21	FY21	FY22	Change from FY21
Q1 (Oct - Dec)	75	101	+36% ↑	9,248	33,804	+266% ↑
Q2 (Jan - Mar)	69	89	+29% ↑	9,255	25,374	+174% ↑
Q3 (Apr - Jun)	74	98	+32% ↑	19,968	40,208	+101% ↑
Q4 (Jul - Sep)	95	108	+14% ↑	30,206	43,324	+43% ↑
FY Average (Oct - Sep)	78	99	+27% ↑	17,169	35,678	+108% ↑

Amtrak Average NEC Weekday Trains



Amtrak Average NEC Weekday Trips

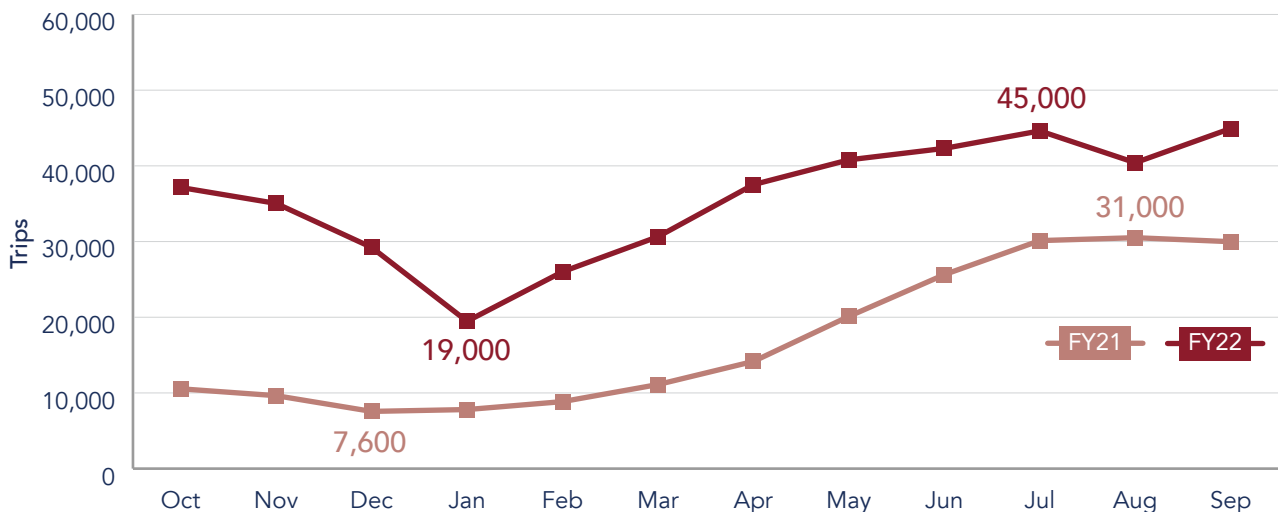


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Page vi: "Penn Station Ceiling. Views of the West 33rd St. Concourse of Penn Station on Tuesday, Aug. 2, 2022, where the a section of the ceiling has been raised and lighted panels installed" by flickr user Metropolitan Transportation Authority, 2022. Used under Creative Commons License Attribution 2.0 Generic (CC BY 2.0); <https://creativecommons.org/licenses/by/2.0/>. Photo available at <https://flic.kr/p/2nBVKGn>.

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Page 15, Clinton Station: Courtesy of CTrail, 2022. Photo available at <https://twitter.com/shorelineeast/status/1512452483389575169>.

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Page 28, middle: Courtesy of Amtrak, 2019.

Page 28, right: Courtesy of the Northeast Corridor Commission, 2022.

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Front Cover: New London, CT
Back Cover: Newark, NJ

