Northeast Corridor Capital Investment Plan

Fiscal Years 2022-2026

October 2021

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A plan 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)/CT*rail*
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)
The District of Columbia Department of Transportation (DDOT)
Virginia Railway Express (VRE)
Amtrak
U.S. Department of Transportation (USDOT)

Amtrak train approaching Metropark Station (NJ)

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Construction crew working on the CP243 Interlocking Project (CT)

Letter from the Co-Chairs

The last 18 months have been difficult for rail and transit providers, as well as for passengers. Due to the coronavirus pandemic, ridership and revenues have declined, and many new challenges have emerged. The railroads of the Northeast Corridor continue to adapt to these changing conditions to provide safe and reliable service. However, despite these numerous recent challenges, we recognize the importance of passenger rail to our economy and the environment and remain committed to rebuilding and improving the Northeast Corridor rail system.

In July, the Commission released CONNECT NEC 2035 (C35)—a 15-year plan representing the most ambitious reinvestment program in the NEC's history. C35 initiated a new way of doing business and provides a blueprint for a faster, modern, and more reliable railroad. The unprecedented level of coordination and analysis in the development of C35 now feeds into the five-year Capital Investment Plan (CIP). Commission member agency staff collaborated, reviewed, revised, and submitted near-term data to align with the C35 plan.

While the C35 plan is ambitious, we are fortunate that the Infrastructure Investment and Jobs Act (IIJA) presents an opportunity to pair our new and unprecedented collaborative planning with historic levels of funding for action. Approval of the IIJA would bring transformative investment into the corridor and generate high-quality jobs, support an electrified, sustainable mode of transportation, and strengthen the Northeast's future as a global economic powerhouse.

NEC railroads and project sponsors are already getting started on implementing C35. In FY22, NEC right-of-way infrastructure owners plan an increased level of spending on the capital renewal of basic infrastructure and on special projects. In particular, 29 projects, including Portal North Bridge, expect to begin construction this year.

Despite the difficult period we are emerging from, the Commission's members look forward to implementing C35, generating significant economic activity and restoring the corridor to provide the fast, frequent, and reliable rail service that the region deserves.

Amit Bose
Deputy Administrator, Federal Railroad Administration
Co-Chair, Northeast Corridor Commission

Kevin S. Corbett
President and CEO, NJ TRANSIT
Co-Chair, Northeast Corridor Commission


The Northeast Corridor consists of four right-of-way infrastructure owners (Amtrak, MBTA, CTDOT, and NY MTA Metro-North Railroad) and multiple station owners and service providers.
Boston
MBTA
MA
Springfield
Providence
RI
NY
Hartford
CT
Metro-North Railroad
CTrail
New Haven
Long Island Rail Road
PA
Newark
New York
SEPTA
Trenton
NJ TRANSIT
Harrisburg
Philadelphia
Wilmington
NJ
MARC
Baltimore
Amtrak
MD
DE
DC
Washington
VRE
VA
NEC Main Line
NEC Connecting Corridor
Intercity Rail
Commuter Rail
Massachusetts Bay Transportation Authority
CT rail
Metro-North Railroad
Long Island Rail Road
NJTRANSIT The Way To Go.
SEPTA
MARC
VRE
AMTRAK

Introduction

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. There were over 800,000 commuter rail and intercity trips per day on the NEC in 2019. If the NEC shut down for just a single day, it would cost the economy $100 million in lost productivity due to additional congestion and other transportation impacts.

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. Continued failure to address the NEC's state-of-good-repair (SOGR) needs will further impact service reliability and jeopardize the economic well-being of the Northeast region and the entire nation.

The coronavirus pandemic dramatically reduced all travel throughout the U.S. and the world and created tremendous economic uncertainty regarding NEC agencies' capital budgets and programming activities. Amtrak and commuter agencies were able to survive a challenging FY21 thanks to emergency federal support and demonstrating resiliency amid changes to service and operations and capital plan adjustments.

When the nation fully emerges from the pandemic, the Northeast Corridor Commission (the Commission) expects rail travel to rebound. The Commission also expects rail to continue to be a critical mode of travel for many people, including those without access to a car; agencies' budgets and revenues will recover; and capital investment will contribute to the recovery from the pandemic's economic challenges.

Northeast Corridor Commission members and staff announce CONNECT NEC 2035 at a July 2021 press conference in Moynihan Train Hall (NY).

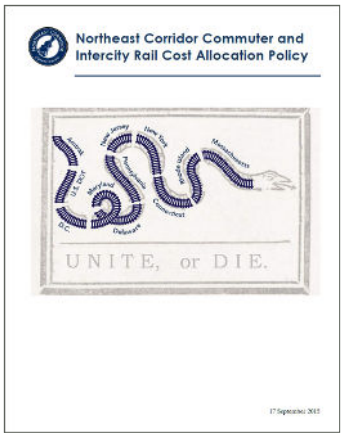
Background

The NEC Commission

The Commission was established 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 NEC Commuter and Intercity Rail 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.

NEC planning and reporting processes, including CONNECT NEC 2035 (C35) and the Capital Investment Plan (CIP), are key components of the transparency, collaboration, and accountability pillar. These processes are intended to enhance coordination on service goals, associated capital investments, and the resources required to implement them. C35 identifies long-term service objectives and associated capital investments; the CIP demonstrates how the Commission and its member agencies could advance C35 in the near-term.

Year One of the CIP is unique. It is an implementation plan constrained by available funding and resources. Year One of the CIP serves as the baseline for quarterly and annual capital program delivery reporting, summarized each year in the NEC Annual Report. Capital program delivery reporting is meant to establish a uniform understanding of capital activities and support greater accountability between all parties.

Figure 1. NEC Commission Plans and Reports

CONNECT 2035

The implementation of C35 will result in 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 capital program delivery reporting.

Annual Report

A report that documents the operational performance of NEC trains, the delivery of Year One of the CIP, and contains recommendations for improvement.

CONNECT NEC 2035 & FY22-26 Capital Investment Plan

Since federal fiscal year 2016, the Commission has developed an annual five-year CIP which integrates infrastructure investments planned by each agency into a single document to create a corridor-wide view of projects and funding needs over the next five years. For the first time, the FY22-26 CIP has CONNECT NEC 2035, a 15-year service development plan and infrastructure planning process, to guide its development.

The Commission released C35 in July 2021, a first-ever multi-agency, multi-year action plan guided by a long-term vision, the Federal Railroad Administration's 2017 NEC FUTURE plan. Through C35, the state governments of the Northeast, the federal government, eight commuter rail agencies, and Amtrak came together as never before to develop a detailed and efficient sequencing of infrastructure investments over 15 years. If funded, this program will achieve significant progress on improving service and addressing the SOGR needs, while keeping this critical system running safely and reliably, and supporting our economy.

The FY22-26 CIP provides more detailed project-level information, including anticipated scopes of work and upcoming project milestones, submitted and vetted by Commission member agencies, for projects which could occur in the next five years according to the C35 sequencing process. Like C35, most of the CIP is fiscally unconstrained and will rely heavily on new funding for implementation.

Unlike C35, the first year of the CIP is fiscally constrained. It serves as an implementation plan and valuable tool for collaboration, transparency, and accountability among NEC agencies. The Commission will use Year One of the CIP as the baseline against which it measures capital program delivery performance. Year One of the CIP is also a barometer of the potential progress that can be achieved with status quo investment levels in the corridor.


Left: A passenger boards the Amtrak Northeast Regional train at Washington Union Station (DC). Middle: Conductor waiting for a train at Trenton Transit Center (NJ). Right: NJ TRANSIT conductor watching over passengers.

The Future of CONNECT NEC & the Capital Investment Plan

The Commission updates the CIP annually per the FAST Act and Cost Allocation Policy and plans to update the CONNECT NEC project delivery analysis roughly every two years. The CIP will continue to include the near-term detail laying out how the Commission is advancing the schedule and sequencing identified in its CONNECT NEC plans.

Agencies are expected to continue advancing project-level planning and any new project information, some of which will be captured through the CIP development process, will in turn feed the next round of CONNECT NEC (C37). Additionally, the Commission plans to continue to use, refine, and improve its CONNECT NEC project delivery tool to incorporate feasible rates of ramping up workforce and equipment resources and to refine program sequencing based on anticipated levels of funding, among other improvements.

FY22-26 Capital Investment Plan

Overview

NEC agencies plan to undertake ambitious investment on the NEC over the next five years to advance the service objectives laid out in C35 and address NEC state-of-good-repair needs. Agencies are planning to invest $49 billion between FY22 and FY26, ramping up significantly from current levels of spending, to advance special projects and capital renewal according to C35 project delivery sequencing if additional funding were made available. At these target investment levels, agencies would be able to advance key projects in every region, lay the groundwork to complete all major backlog projects in the next fifteen years, and complete a portion of the C35 capital renewal program.

Traditionally NEC agencies annually piece together limited federal, Amtrak, state, commuter agency, and/or local funding sources to maintain a safe railroad and advance a few major projects, as shown in Figure 3. This fragmented approach to funding means that the corridor's substantial SOGR needs are not fully addressed and many important projects are delayed. Implementation of the FY22-26 CIP is dependent on a new kind of funding program, as described in C35, with predictable multi-year funding to give agencies the certainty they need to advance project planning and design, hire a larger workforce, buy equipment, and enter into major construction contracts.

Types of NEC capital investment

Capital renewal of basic infrastructure includes the routine repair or replacement of existing basic infrastructure assets to keep the NEC safe for train operations and is managed by the infrastructure owner.

Special projects include "major backlog projects" which represent the complete overhaul or replacement of major bridges and tunnels and "improvement projects" aimed at creating new infrastructure above and beyond existing assets or replacing existing assets with markedly superior ones. Special projects are coordinated by any NECC agency.

See Project Information Appendix for more details.

Figure 2. FY22 Planned Expenditure and FY23-26 Target Spend

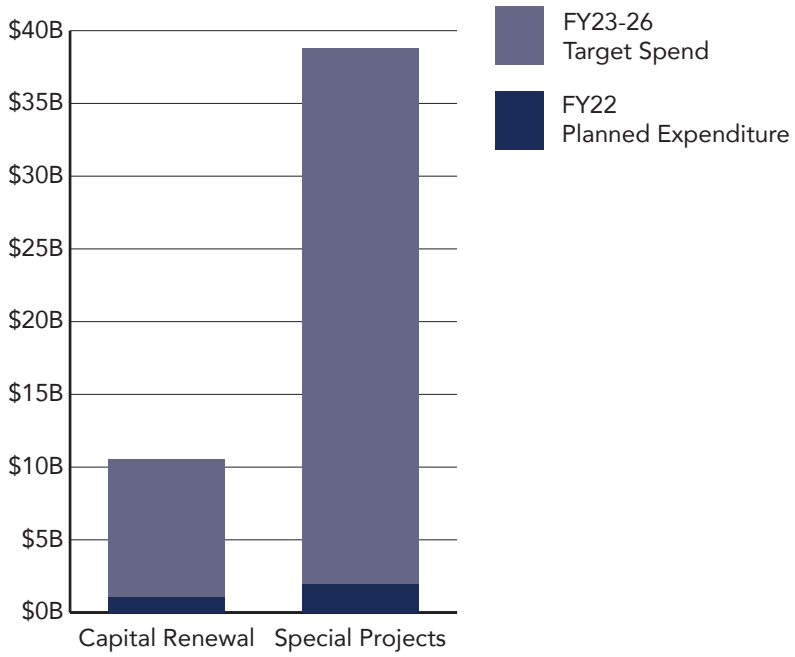


Figure 3. NEC Funding Sources

Baseline Capital Charges: Commitment by all passenger railroads operating on the NEC to contribute funding toward NEC capital renewal needs based on a consistent formula agreed to in the Cost Allocation Policy.

Amtrak's NEC Operating Surplus: Prior to the pandemic, Amtrak's NEC services consistently generated an operating surplus, in part supported by operating payments made by other operators through the Policy. Amtrak reinvests these funds back into corridor infrastructure and other NEC needs like rolling stock.

Amtrak's NEC and National Network Accounts: Each year, as part of its annual legislative and grant request to Congress, Amtrak requests funding for the NEC and National Network accounts. Amounts for the NEC account are provided by Congress and invested in NEC infrastructure and other NEC needs like rolling stock, while a portion of funding for the National Network account are invested in the NEC's connecting corridors.

State, commuter agency, and local sources: Each NEC state and transit agency has its own revenue sources that fund transportation investments including NEC projects, local matches for federal grants, or as a means of sourcing their BCC payments.

Federal formula-based sources: FTA formula-based grant programs are allocated to geographic areas and, ultimately, transit agencies or providers. States and transit agencies can decide to spend some of their allocation on NEC projects or as a means of sourcing their BCC payments. In addition, states may flex some FHWA funds to transit and rail projects.

Federal discretionary grants and loans: NEC infrastructure investment is an eligible activity under a variety of federal competitive grant and loan programs to which agencies may apply for funding:

- FRA Federal-State Partnership for Intercity Passenger Rail Program (formerly SOGR)
- FRA Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program
- FTA Sec. 5309 Capital Investment Grants
- USDOT Rebuilding American Infrastructure with Sustainability and Equity (RAISE) program (formerly known as the TIGER or BUILD program)
- USDOT National Infrastructure Project Assistance
- FRA Railroad Rehabilitation & Improvement Financing (RRIF) Program

Should the Infrastructure Investment and Jobs Act be enacted into law, the federal funding sources listed will receive increased dollar amounts for FY22-FY26.

Infrastructure Investment and Jobs Act

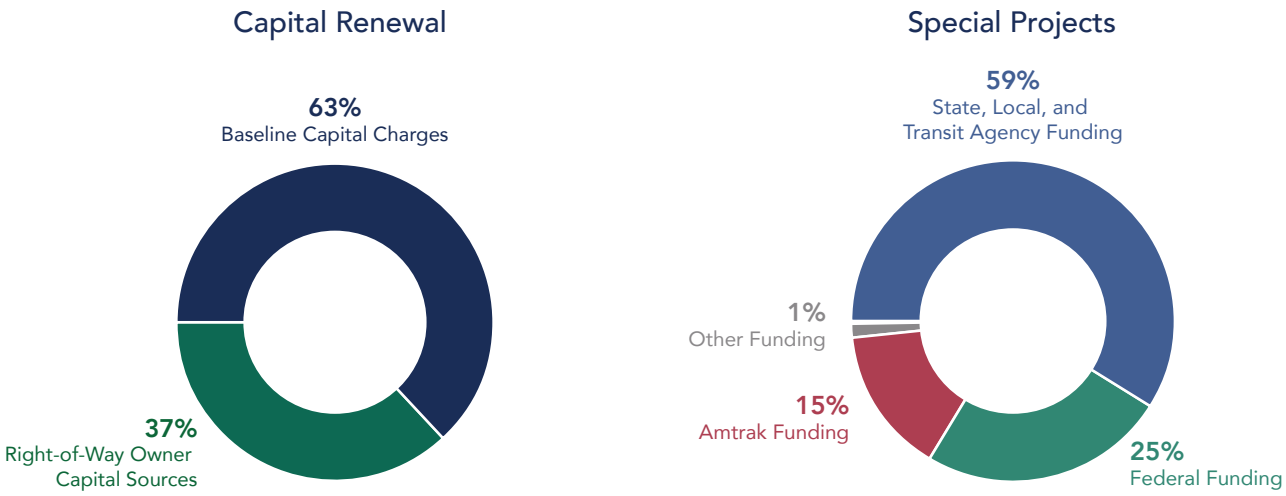
Following the release of C35 in July 2021, Congress took steps to increase federal rail funding through the bipartisan Infrastructure Investment and Jobs Act (IIJA), including a reformed Federal-State Partnership for Intercity Passenger Rail Grant Program. At the time of CIP publication, the legislation has passed the Senate and is awaiting action in the House. Should the IIJA be enacted into law, project sponsors on the NEC may seek to combine a mix of this new federal funding available through several programs with state and local sources to implement the C35 plan and advance projects in the most efficient way possible.

One-Year Information

Of the total $3.0 billion planned expenditure in FY22, $1.1 billion of that is on capital renewal of basic infrastructure and $1.9 billion on special projects. These planned investments are funded through a variety of sources including baseline capital charges (see Project Information Appendix for more details); discretionary federal grants and FTA formula funds; Amtrak's annual appropriations; and state, local, and/or commuter agency sources.

Planned FY22 spending is higher than in previous plans. FY21 planned expenditure was $1.9 billion. This increase can be attributed to large projects such as Walk Bridge in Connecticut, Penn Station Access in New York, and Portal North Bridge in New Jersey advancing construction this year. Nevertheless, at current funding levels agencies are only able to advance existing projects and no additional major backlog or improvement projects are entering the pipeline in FY22.[1]

Figure 4. FY22 Funding Sources by Type



[1] Data for this plan were gathered in Summer of 2021.

One-Year Plan Highlights

FY22 Capital Renewal and Special Project Investments

Year One of the CIP is a resource for operators to understand how owners will spend baseline capital charges in the upcoming year. Project sponsors also provide FY22 special project investment details. Draft plans are provided by owners and project sponsors for review and comment.

The Project Information Appendix includes additional detail on FY22 planned investments and BCC spending levels by operator territory. Complete FY22 details can be found on the Commission website at www.nec-commission.com/FY22-26-CIP.

1 New England

Capital renewal investments in New England include:

- Installing **fencing** to secure critical infrastructure assets in Pawtucket, Niantic, New London, and other locations;
- Initiating **state-of-good-repair upgrades** at several movable bridges, replace bridge timbers on the Connecticut River Bridge and Middletown Avenue Bridge, and conduct culvert repairs and replacements;
- Replacing **track infrastructure** such as wood and concrete ties, interlocking steel, and insulated joints;
- Renewing two turnouts at **Branford Interlocking** and **Orms Interlocking** to provide more reliable rail operations; and
- Completing upgrades to concrete guardrail ties and replace rail components as part of the **South Station Tie and Rail Replacement Project**.

Tower 1 Interlocking. Completing final design and beginning construction to upgrade signals, communication systems, and tracks, which will provide immediate operational, reliability, and resiliency benefits to MBTA's South Side Commuter Rail system, Amtrak's NEC and Lake Shore Limited services.

More New England special project highlights:

- **Fitter Interlocking.** Continuing construction of a new interlocking to minimize operational disruption and improve NEC reliability.
- **Back Bay Platform Ventilation.** Completing final design to bring Back Bay Station to a state of good repair.
- **Pawtucket / Central Falls Station.** Finishing construction to introduce a new commuter rail station in Pawtucket, RI.
- **Shoreline East Track and Catenary Improvements.** Commencing construction to support future electrification of Shoreline East.

2 Connecticut-Westchester (New Haven Line)

Capital renewal investments in Connecticut-Westchester (NHL) include:

- Advancing design and preparing temporary power sources for the **Substations 128 and 178 Replacement Project**;
- Continuing construction of the Willet Avenue and Highland Street **undergrade bridge spans**;
- Completing software revisions and final fiber optic tie-in for **Positive Train Control** installation on the NHL;
- Completing preliminary engineering and commencing final design for the **Time for CT Program**; and
- Beginning **pre-construction activities** to install nearly 31,000 ties, surface approximately 51 track miles, lay about 33 miles of rail, and install approximately 26 switches.

Stamford Station Improvements. Finishing upgrades and repairs to ensure continued safe operations and improve passenger experience. Enhancements include increasing canopy and windscreen coverage, adding pedestrian paths a new pedestrian bridge and parking garage, rehabilitating aging sections of the platforms, and improving ADA compliance.

More Connecticut-Westchester (NHL) special project highlights:

- **Walk Bridge Program.** Entering construction phase for bridge proper including utility relocation and demolition of south half of bridge.
- **New Haven Line Station Platform Replacement Program.** Beginning construction of new platforms at Darien Station and design of new platforms at New Haven Station.

3 New York City Metro

Capital renewal investments in New York City Metro include:

- Repairing and replacing **overhead catenary** infrastructure and ancillary equipment at Bergen, Dock West, and Morris;
- Bringing **track assets** to a state of good repair such as surfacing, upgrading drainage, and replacing insulated joints, interlocking steel, and ballast;
- Completing 102 miles of **high-speed surfacing** in New Jersey for a smoother and safer ride;
- Continuing construction of the **Clark to Ham Constant Tension Upgrade Project** by completing foundation installation on Track 4, procuring catenary steel structures, and installing lower catenary poles; and
- Issuing notice to proceed for construction to begin installing new monopoles as part of the **Kearny to Waverly Transmission Tower Upgrade Project**.

Penn Station Access. Initiating final design to introduce Metro-North NHL service to PSNY, construct four new commuter stations in the Bronx, and bring Amtrak's Hell Gate Line to a state of good repair.

Portal North Bridge. Commencing construction to replace the century-old Portal Bridge over the Hackensack River with a new bridge to facilitate increased capacity and reduced delays and operating costs.

More New York City Metro special project highlights:

- **Penn Station New York: Platforms 7 & 8 Refurbishment.** Beginning construction to replace six staircases and bring platforms to a state of good repair.
- **Hudson Tunnel.** Continuing pre-construction activities to construct a new, two-track tunnel and modernize the existing tubes.
- **Trenton Transit Center State of Good Repair.** Commencing design for several structural and customer-facing improvements to bring the station to a state of good repair.

4 Mid-Atlantic North

Capital renewal investments in Mid-Atlantic North include:

- Addressing **ride quality** issues by improving drainage, bridge approaches, and bridge exits by replacing ballast with netting and Geo Cell;
- Bringing **substation assets** to a state of good repair by performing work on breakers, control houses, fencing, frequency converters, lighting transformers, and other necessary components;
- Performing over 1 million feet of **high-speed surfacing** at interlockings and track segments to ensure tracks are aligned for a smooth ride;
- Procuring a contractor for the installation of a new water main to replace the existing 100-year-old water main at **Penn Coach Yard**; and
- Initiating construction at the Bryn Mawr substation as part of the **Zoo to Paoli Catenary Structure Upgrade Project**.

Zoo Interlocking. Starting retaining wall and track work as part of state-of-good-repairs to this critical Harrisburg Line interlocking. Upgrades will enhance Amtrak and SEPTA operational efficiency, increase train speed and capacity, and decrease travel times for passengers.

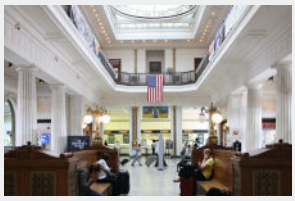
More Mid-Atlantic North special project highlights:

- **30th Street West Catenary Replacement.** Completing design and starting construction to replace and modernize the overhead catenary system, which will improve system reliability.
- **Coatesville Station Improvements.** Commencing construction to implement ADA-accessible features, parking options, and multimodal connections that will enhance future economic development.
- **Southwest Connection Improvement Project.** Finishing construction of replacement and reconfiguration of signals, track, catenary, and interlockings to improve system reliability.

5 Mid-Atlantic South

Capital renewal investments in Mid-Atlantic South include:

- Bringing structures to a state of good repair by replacing three culverts, upgrading movable bridges, enhancing ventilation in the **First Street tunnel**, and installing one bridge strike mitigation beam;
- **Undercutting** over 75,000 feet of track to support state of good repair efforts, decrease service delays, and reduce maintenance costs;
- Replacing 1,000 feet of track and associated block ties and concrete in the **B&P Tunnel** to mitigate service disruptions;
- Refreshing **Washington Union Station Platforms 16 and 17** such as removing and replacing platform tactile warning strips, rehabilitating concrete platform edges, and performing trip hazard mitigation to ensure ADA compliance; and
- Conducting operational and safety upgrades to Washington Union Station's **Ivy City electrical infrastructure** such as completing construction for generator connection and substation upgrades.



Baltimore Penn Station Master Plan. Continuing design and construction to advance critical state of good repair projects and accommodate future growth and development. These initiatives and improvements to rail operations will transform Baltimore Penn Station into a vibrant transportation hub.

More Mid-Atlantic South special project highlights:

- **MARC Martin's Yard Upgrade.** Continuing construction activities to build two additional storage tracks and electrify track that will increase train storage capacity and facilitate faster movements in and out of Martin's Yard.
- **Baltimore & Potomac Tunnel Procurement and Design Activities.** Beginning procurement and design work for various reconstruction elements of the B&P Tunnel Replacement Program.
- **Washington Union Station: Near Term Rail Program.** Finalizing design of critical infrastructure to enhance station operational flexibility, fix safety and security deficits, and facilitate more efficient train movements.
- **Susquehanna River Bridge Replacement: Phase 1.** Advancing design to 60% for approaches, main structure, rail systems, and Grace interlocking.

6 Amtrak System-wide

Capital renewal investments for Amtrak System-wide include:

- Investing over $180 million in **new engineering equipment** to support the renewal and improvement of the NEC. This will expand Amtrak's capacity to carry out engineering projects with new specialized equipment, while supporting production programs such as undercutting, surfacing, and tie replacement;
- Designing, procuring, and installing **wayside signage** where Amtrak high speed main line tracks operate near freight railroad tracks and switches;
- Finishing final design and beginning procurement of **voice radio systems** to upgrade all wayside and office radio equipment; and
- Inspecting overhead catenary system structures and related components as part of the **Electric Traction System/Aerial System Assessment Project**.

Next Generation High Speed Fleet Infrastructure. Undertaking various investments in the next generation of high speed fleet infrastructure and will continue construction on the following initiatives in FY22:

More Amtrak System-wide special project highlights to support the next-generation high speed fleet:

- **Ride Quality Investment.** Improving current track surfacing to facilitate more efficient maintenance operations and better ride quality for passengers.
- **Safety Mitigation.** Investing in several safety initiatives that permit Amtrak Tier III trainsets to operate at maximum speeds on the NEC.

Five-Year Information

The five-year plan information in the CIP reflects current projections, building off of C35 analysis, of what could be accomplished on the NEC in FY22-26 if sufficient funding were made available. C35 was the first iteration of a 15-year plan to reduce the NEC state-of-good-repair backlog and improve the system to meet 2035 service goals. C35 focused on sequencing construction to maximize productivity of track outages and minimize service impacts. It was not constrained by funding availability or an analysis of how quickly agencies can grow their workforces and develop contracts with the private sector. The Commission and its members are now commencing this kind of analysis. It is possible that some work in these early years may be shifted to later years based on these factors, potentially reducing early-year costs and increasing out-year costs.

Of the $49 billion FY22-26 target spend, approximately $10 billion would be spent on capital renewal of basic infrastructure and approximately $39 billion on special projects. The capital renewal investment would allow right-of-way owners to address NEC state-of-good-repairs needs as sequenced in C35.

An investment of $13 billion in major backlog projects would allow not only for the completion of Walk Bridge Program and Portal North Bridge, but also for advancing five additional major backlog projects to construction (see Five-Year Highlights).

Approximately $17 billion would be spent on major station projects including completing SOGR work and advancing design and construction of station expansion and modernization at New York Penn, Philadelphia 30th Street, Baltimore Penn, and Washington Union Stations.

Approximately $9 billion would initiate, continue, and complete improvement projects. Example project activity includes beginning construction on a new third track in Massachusetts to support existing and new service, completing two Delaware station projects, and replacing outdated signal systems to allow bi-directional train movements and support more efficient operations on the Harrisburg Line.

Figure 5. NEC Planned and Target Expenditures: One-, Five-, and Fifteen-Years (billions)

	One-Year Planned Expenditure (FY22)	Five-Year Target Expenditure (FY22-26)	Fifteen-Year Target Expenditure (FY22-36)
Capital renewal of basic infrastructure	**$1.1**	**$10.5**	**$38.9**
Special projects	**$1.9**	**$38.8**	**$77.7**
Major backlog	$0.5	$12.8	$27.0
Major stations	$0.4	$17.2	$28.8
Improvement[1]	$1.0	$8.8	$21.9
Total Spend	**$3.0**	**$49.3**	**$116.6**

Note: (1) Improvement projects include Planning Studies.

Five-Year Plan Highlights

Select projects which could advance to construction in FY22-26 if additional funding were available

The following highlights include a sample of projects which have some funding for pre-construction activities but need additional funding to advance to construction in the next five years. These highlights include projects of particular significance for their potential to improve service reliability and address SOGR needs.

The Project Information Appendix includes additional detail on all NEC project activity which could occur in FY22-26. Complete details can also be found on the Commission website at www.nec-commission.com/FY22-26-CIP.

Connecticut River Bridge Replacement

New England

This project will replace the century old bridge between Old Saybrook and Old Lyme, CT. This major backlog project will address critical NEC SOGR needs as many key elements of the bridge have reached the end of their design life and require extensive maintenance. Replacing the bridge would improve reliability for both Amtrak and Shore Line East trains.

The Connecticut River Bridge Replacement is currently in final design and could advance to construction in the next five years.

East River Tunnel Rehabilitation

New York City Metro

This project would rehabilitate Tubes 1 and 2 of the East River Tunnel between Penn Station, NY and Queens, NY. The tubes are in desperate need of rehabilitation and improvement due to continually worsening conditions given its age and damage related to Superstorm Sandy. Completing this project would ensure continuation of operations for LIRR, NJ TRANSIT, and Amtrak and address current capacity constraints which cause bottlenecks in and out of Penn Station.

Five-Year Plan Highlights: Select projects which could advance to construction in FY22-26

Penn Station Reconstruction & Expansion

New York City Metro

This project will reconstruct the existing New York Penn Station to transform the outdated and over-capacity station, relieve overcrowding, and be part of an integrated complex with Moynihan Train Hall and Penn Expansion. The Penn Expansion project will provide additional track and platform capacity to support growth in rail service possible with the new Gateway Hudson Tunnels. The station is badly in need of major investment to maintain and expand operations, renew its infrastructure, and re-establish itself as the premier rail transportation center in the New York Metropolitan region.

Gateway Program: Hudson Tunnel Project

New York City Metro

Hudson Tunnel Project is scheduled to be the next project in the Gateway Program to advance to construction after Portal North Bridge. This project will construct a new two-track rail tunnel beneath the Hudson River, rehabilitate and modernize the existing two-track North River Tunnel, and construct the third and final rail right-of-way preservation section beneath Hudson Yards. When complete, the project will provide increased reliability and operational flexibility for Amtrak and NJT on the NEC.

Harrisburg Line Interlocking Projects

Mid-Atlantic North

This group of projects includes interlocking improvements for Amtrak's Keystone Corridor and SEPTA's Paoli-Thorndale Line, replacing or reconfiguring outdated interlockings that present a challenge to reliability. The interlocking improvements support existing and future ridership growth and support flexible operations. With current funding, agencies can complete early action work at Zoo interlocking, but additional funding is needed to complete the entire scope of that project and the other interlockings' SOGR work.

Five-Year Plan Highlights: Select projects which could advance to construction in FY22-26

Susquehanna River Bridge Replacement Phase 1

Mid-Atlantic South

In Phase 1, this major backlog project improves speed and reliability by replacing the existing two-track movable Susquehanna River Bridge with a modern, two-track, high-level, fixed structure. Built in 1906, the existing two-track bridge is nearing the end of its useful life. The current bridge requires trains to reduce speeds for almost a mile due to its condition. A new asset is required in order to maintain operations through this section of Maryland.

B&P Tunnel Replacement Program

Mid-Atlantic South

This program of projects will ultimately replace the functionally outdated, low speed, two-track, mile-and-a-half-long B&P Tunnel constructed in 1873 with the new Frederick Douglass Tunnel, a modern higher speed, two-mile long tunnel which will reduce trip times for more than 22,000 daily passengers by permitting speeds up to 100 mph, a dramatic improvement from the current maximum speed of 30 mph, the lowest non-terminal speed on the NEC. In addition to the new tunnel, the program includes track improvements and improvement of the northern and southern approaches to the new tunnel between Winans interlocking and Baltimore Penn Station.

High Capacity Signaling: Washington to Baltimore

Mid-Atlantic South

This project is needed to significantly improve minimum intervals between trains from the current signal system headway of about 7 minutes to about 3 minutes, in order to accommodate increased Amtrak and MARC train frequencies proposed in CONNECT NEC 2035. This means required close train spacing between Grove and Bridge Interlockings, necessitating a higher capacity signaling system.

Addressing State of Good Repair on the Northeast Corridor

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 basic infrastructure, 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 C35 project delivery analysis created a roadmap to vastly reduce the SOGR backlog over 15 years.

Major Backlog Assets

C35 proposes to complete all major backlog projects over the next 15 years. These large bridge and tunnel replacement or rehabilitation projects will eliminate a significant portion of the SOGR backlog for many generations. The cost of addressing major backlog asset SOGR is based on the total project cost of the associated replacement or rehabilitation projects. Total project cost estimates may fluctuate between plans as projects advance design but is currently estimated at $27 billion. Two major backlog projects are currently under construction: Walk Bridge Program and Portal North Bridge.

Figure 6. Estimated cost of addressing major backlog SOGR, FY22-36 (billions)

Major Backlog Projects		**$27.0**
CT	Connecticut River Bridge Replacement	$0.4
	Devon Bridge Replacement	$1.0
	Saugatuck Bridge Replacement	$0.4
	Walk Bridge Program	$0.7
	Cos Cob Bridge Replacement	$1.0
NY	Pelham Bay Bridge Replacement	$0.6
	East River Tunnel Rehabilitation	$1.2
NJ	Gateway: Hudson Tunnel Project	$11.6
	Gateway: Portal North Bridge	$1.7
	Gateway: Sawtooth Bridges Replacement	$1.4
	Gateway: Highline Renewal[1]	$0.2
MD	Susquehanna River Bridge Replacement (Phase 1)	$2.1
	Bush River Bridge Rehabilitation[1]	$0.3
	Gunpowder River Bridge Rehabilitation[1]	$0.5
	Baltimore & Potomac Tunnel Replacement Program	$3.9

Note: (1) These projects do not have any pre-construction or construction activity planned during FY22-26 so are not included in this plan. Details for major backlog projects with planned FY22-26 activity can be found in the Project Information Appendix.

Basic Infrastructure Assets

C35 also proposes major investment in basic infrastructure capital renewal to reduce that backlog and will make meaningful progress towards bringing all assets to a state of good repair by 2035. Through C35, the Commission has revised its approach to measuring capital needs for basic infrastructure SOGR. The previous assessment measured a snapshot value of the basic infrastructure backlog based on a percent of assets beyond their useful life. That estimate, static at $11.6 billion for many years, was based on an Amtrak study from 2013. It has not accounted for assets that fell out of SOGR since 2013 and it never accounted for assets that will fall out of SOGR in the future.

The new $38.9 billion figure reflects overall projected basic infrastructure capital renewal spending over 15 years, using updated asset data and unit costs and accounting for both assets already in the backlog and assets that will enter the backlog, based on an analysis that factors in asset age and condition (where available) and the track outage needs associated with capital renewal investment. A significant portion of these costs will be funded by the Cost Allocation Policy's Baseline Capital Charges (BCCs). This roughly $1 billion annual funding level, referred to as normalized replacement, is the amount agencies would spend every year to keep the NEC in SOGR. Investment above that level would reduce the backlog over the next 15 years and bring annual investment needs beyond 2035 closer to normalized replacement levels.

But it is important to remember that basic infrastructure assets will age beyond their useful life in 2036 and every year beyond that, making annual basic infrastructure capital renewal investments the job of every generation.

Figure 7. Estimated cost of addressing basic infrastructure SOGR, FY22-36 (billions)

Basic infrastructure asset replacements by discipline[1]	**$38.9**
Track	$5.9
Communication & Signals	$2.6
Electric Traction	$11.6
Structures	$18.8

Note: (1) Basic infrastructure asset replacement cost reflects C35 analysis which estimated the cost of replacing most assets that reach or exceed 95% of their projected useful life during the next fifteen years. Force account protection and supervision costs are divided proportionally between the four basic infrastructure disciplines.

Existing Portal Bridge (NJ)

CP243, part of the Walk Bridge Program (CT)

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