

1.1 INTRODUCTION

The Federal Railroad Administration (FRA) is the lead Federal agency issuing this Final Environmental Impact Statement (FEIS) to evaluate the Hudson Tunnel Project (the “Proposed Action” or the “Project”) in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 USC § 4321 et seq.). The New Jersey Transit Corporation (NJ TRANSIT) and the Port Authority of New York and New Jersey (PANYNJ) are joint lead agencies for the FEIS. The Proposed Action is intended to preserve the current functionality of the Northeast Corridor’s (NEC) Hudson River passenger rail crossing between New Jersey and New York and strengthen the resilience of the NEC. The Project would consist of construction of a new rail tunnel under the Hudson River, including railroad infrastructure in New Jersey and New York connecting the new rail tunnel to the existing NEC, and rehabilitation of the existing NEC tunnel beneath the Hudson River.

Prior to issuing permits or approvals for a project, including approval of funding, Federal agencies must consider the environmental effects of their actions under NEPA. Accordingly, FRA and NJ TRANSIT prepared this EIS to comply with the requirements of the Council on Environmental Quality’s (CEQ) regulations implementing NEPA (40 CFR Parts 1500-1508),¹ and the FRA *Procedures for Considering Environmental Impacts* (FRA’s Environmental Procedures, 64 FR 28545, May 26, 1999, as updated in 78 FR 2713, January 14, 2013). Where relevant, the analysis also meets the NEPA procedures of the two Cooperating Agencies for the Project—the Federal Transit Administration (FTA) and the U.S. Army Corps of Engineers (USACE)—including and the joint Federal Highway Administration (FHWA) and FTA *Environmental Impact and Related Procedures* (23 CFR Part 771). The EIS also documents compliance with other applicable Federal, New Jersey and New York State, and local environmental laws and regulations, including Section 106 of the National Historic Preservation Act; the Conformity requirements of the Clean Air Act; the Clean Water Act; the Rivers and Harbors Act of 1899; Section 4(f) of the Department of Transportation Act of 1966 (Section 4(f)); the Endangered Species Act; Executive Order 11988 and U.S. Department of Transportation (USDOT) Order 5650.2 on Floodplain Management; Executive Order 11990 on Protection of Wetlands; the Magnuson-Stevens Act related to Essential Fish Habitat; the Coastal Zone Management Act; Executive Order 12898 on Environmental Justice; and the *Environmental Justice Policy Guidance for Federal Transit Administration Recipients*, FTA C 4703.1. The EIS also meets the requirements of state and local agencies from which permits or approvals will be sought, including the New Jersey Department of Environmental Protection (NJDEP) and the New York State Department of Environmental Conservation (NYSDEC). It also meets the requirements of New York City Environmental Quality Review (CEQR), which applies to New York City agencies that will issue permits or approvals for portions of the Project.

¹ This EIS was prepared in accordance with CEQ’s regulations implementing NEPA (40 CFR Parts 1500-1508) from 1978, as amended in 1986 and 2005. CEQ comprehensively updated its NEPA implementing regulations effective September 14, 2020; the revised regulations apply to any NEPA process begun after that date. For NEPA reviews initiated prior to September 14, 2020, the lead Federal agency may continue to apply the prior regulations. FRA initiated the NEPA process for the Hudson Tunnel Project in 2016 with publication of a Notice of Intent (NOI) in the Federal Register, and is applying the CEQ regulations that were in effect at the time of that NOI.



CEQ's NEPA regulations require Federal agencies to consider reasonable alternatives to the proposed action as well as the effects of their actions on the human and natural environment. Consistent with those regulations, this EIS describes potential alternatives to the Proposed Action and describes the evaluation process FRA and NJ TRANSIT conducted to identify the Preferred Alternative. For the Preferred Alternative, it describes the potential impacts the Project would have on social, economic, and environmental conditions; and measures to avoid, minimize, or mitigate adverse impacts.

This chapter reflects the following changes made since the Draft Environmental Impact Statement (DEIS) for the Hudson Tunnel Project:

- Updated descriptions of the roles and responsibilities of the various parties involved in design, environmental review, and future funding and construction of the Project;
- Identification of the Project Sponsor for the Project;
- Additional information about the NEC FUTURE program and the Project's relationship to proposed capacity enhancement for the NEC; and
- Updated discussion of existing conditions in the North River Tunnel.

This chapter contains the following sections:

- 1.1 Introduction
 - 1.1.1 Roles and Responsibilities
 - 1.1.2 Project Sponsor and Joint Lead Agency
 - 1.1.3 Overview of Project Purpose and Need
- 1.2 Project Background
 - 1.2.1 Access to the Region's Core (ARC) Project
 - 1.2.2 Gateway Program
 - 1.2.3 NEC FUTURE
 - 1.2.4 Project's Relationship to Proposed Capacity Enhancement
- 1.3 Project Purpose
- 1.4 Project Need
 - 1.4.1 Need to Rehabilitate the North River Tunnel
 - 1.4.2 Need to Maintain Existing Passenger Rail Service
 - 1.4.3 Summary
- 1.5 Goals and Objectives

1.1.1 ROLES AND RESPONSIBILITIES

FRA is the lead Federal agency and NJ TRANSIT and the PANYNJ are joint lead agencies for this FEIS. This FEIS describes and presents information about the Preferred Alternative for the Hudson Tunnel Project, including information on how the Hudson Tunnel Project may progress toward construction following completion of the NEPA review process. This section describes the roles and responsibilities of parties involved in this FEIS and the NEPA review, and that may be involved and responsible for progressing the Project after the NEPA review. See also Section 1.1.2 of this chapter for more detail regarding the change to roles and responsibilities since publication of the Draft Environmental Impact Statement (DEIS).

- **FRA, NJ TRANSIT, and the PANYNJ:** FRA is the lead Federal agency for the preparation of the FEIS; NJ TRANSIT and the PANYNJ are joint lead agencies for the FEIS.
- **Cooperating Agencies:** Pursuant to the Council on Environmental Quality's NEPA regulations, Cooperating Agencies are Federal agencies, other than a lead agency, that have jurisdiction by law or special expertise with respect to environmental impacts for a proposed project. For the Hudson Tunnel Project, the USACE and FTA are Cooperating Agencies.

- The USACE is a Cooperating Agency because it will have a permitting action as part of Project implementation; and
- FTA is a Cooperating Agency given its technical expertise and current and potential future role in supporting the advancement of this Project through NEPA, final design, and construction.
- **Amtrak (the National Railroad Passenger Corporation):** Amtrak is the owner and operator of the NEC in the Project area, including the existing North River Tunnel and Penn Station New York (PSNY). Amtrak is responsible for developing the preliminary design of the Hudson Tunnel Project.
- **Project Partners:** Consisting of NJ TRANSIT, Amtrak, and the PANYNJ, who are working together to advance the Hudson Tunnel Project.
- **Gateway Program Development Corporation:** A New Jersey non-profit corporation established to coordinate, develop, operate, finance, manage, own, or otherwise engage in activities to effectuate the Gateway Program (described below in Section 1.2.2), with support from various partner agencies. The Hudson Tunnel Project is an independent element of the larger Gateway Program.
- **Gateway Development Commission (GDC):** A public authority and government-sponsored authority created when the States of New York and New Jersey enacted the Gateway Development Commission Act in each of the two states in July 2019. GDC is governed by a Board of Commissioners comprised of three Commissioners from the State of New York, three Commissioners from the State of New Jersey, and one Commissioner appointed by Amtrak. The GDC is empowered to facilitate and coordinate activities to effectuate the Gateway Program (described below in Section 1.2.2; the Hudson Tunnel Project is an independent element of the larger Gateway Program), including applying for and receiving Federal, state, and local funds. The predecessor to the GDC was the Gateway Program Development Corporation.
- **Lead Federal agency:** FRA is the lead Federal agency for NEPA review, including preparation of this EIS. For purposes of Project implementation, the lead Federal agency will be the agency that will provide the majority of Federal funding for Project implementation and be responsible for ensuring compliance with mitigation commitments identified in the Record of Decision (ROD). If FRA provides the majority of Federal funding for implementation of the Project, it will be the lead Federal agency responsible for ensuring that environmental and other Project commitments identified in the ROD are met. If FTA is the agency providing the majority of Federal funding for implementation of the Project, it will be the lead Federal agency responsible for ensuring environmental and other Project commitments identified in the ROD are met.
- **Project Sponsor:** The entity that receives Federal financial assistance that will be responsible for advancing the Project through final design and construction and for meeting the commitments identified in the lead Federal agency's ROD. The PANYNJ is currently the Project Sponsor, and will be responsible for committing to mitigation measures through construction. The PANYNJ will remain the Project Sponsor until such time as the GDC assumes the role of Project Sponsor. The PANYNJ and the GDC anticipate that change will occur prior to the award of Federal financial assistance for the Project.²

² On May 12, 2021, the Board of the GDC voted to formally recognize its commitment to take over the role of Project Sponsor of the Hudson Tunnel Project from the PANYNJ prior to the award of any Federal financial assistance for the Project.



- **Project contractor:** The party or parties that will build the Project under the direction of the Project Sponsor. The Project contractor will be selected by the Project Sponsor through a procurement process.
- **Permittees for Department of Army Permit:** Amtrak and NJ TRANSIT are the joint applicants for a Department of Army permit from the USACE. The USACE will be responsible for ensuring that the Permittee or Joint Permittees listed on any Department of Army permit relevant to the Project implement the measures necessary for compliance with the terms and conditions of the permit. As the Project design advances, the role of the Permittee(s) may be transferred to another entity or entities, subject to approval of the USACE, at which time the full responsibility for compliance with the terms and conditions of the Department of Army permit will also be transferred.

1.1.2 PROJECT SPONSOR AND JOINT LEAD AGENCY

FRA, as the lead Federal agency, and NJ TRANSIT, as a joint lead agency, prepared the DEIS. On June 29, 2018, the PANYNJ notified FTA that the PANYNJ would serve as the grant applicant and NEPA Project Sponsor (see **Appendix 1** of this FEIS). On August 17, 2018, the PANYNJ formally notified the FRA about its intent to serve as NEPA Project Sponsor for the Hudson Tunnel Project. Pursuant to 23 CFR § 771.109(c)(2), as a local governmental entity, the PANYNJ subsequently became a joint lead agency for this FEIS.

Prior to becoming NEPA Project Sponsor and in addition to continuing its role as a Project Partner, the PANYNJ was a Participating Agency for the DEIS that provided support and assistance to the Project Partners during development of the preliminary engineering and planning for the Hudson Tunnel Project's design. In becoming a joint lead agency, the PANYNJ relied on the efforts of FRA and NJ TRANSIT in developing the DEIS and concurs with the conclusions of this FEIS.

This FEIS clarifies where and how FRA, NJ TRANSIT, and/or the PANYNJ led analyses, made or concurred with impact determinations, hosted and/or participated in public and/or agency meetings, and served in any other capacity in the NEPA process. Consistent with the roles and responsibilities identified in Section 1.1.1, as the current Project Sponsor, the PANYNJ will comply with mitigation measures and commitments identified in the ROD. The lead Federal agency will be responsible for ensuring that the Project Sponsor meets the commitments identified in this FEIS and the ROD.

1.1.3 OVERVIEW OF PROJECT PURPOSE AND NEED

The existing NEC rail tunnel beneath the Hudson River is known as the North River Tunnel.³ **Figure 1-1** illustrates the location of the North River Tunnel and its approach tracks. This tunnel is used by Amtrak for intercity passenger rail service and by NJ TRANSIT for commuter rail service. As shown in the figure, the approach to the tunnel begins east of NJ TRANSIT's Frank R. Lautenberg Secaucus Junction Station in Secaucus, New Jersey (which is 5 miles east of Amtrak and NJ TRANSIT's Newark Penn Station). The tracks of the NEC approach the North River Tunnel on a raised embankment through the New Jersey Meadowlands in Secaucus and North Bergen, New Jersey. The tracks enter a tunnel portal at the western face of the Palisades⁴ in North Bergen, passing beneath Union City and Weehawken, New Jersey and the Hudson River before emerging at Penn Station New York (PSNY) in New York City. The North River Tunnel actually has two separate tunnels (individually referred to as "tubes"), each accommodating a single track for

³ "North River" is an alternate name for the Hudson River, based on an early Dutch name for the river.

⁴ The Palisades are a line of steep cliffs that run along the western side of the Hudson River from northeastern New Jersey into southern New York State. In North Bergen and Union City, the Palisades are approximately 300 feet above the land to their west and east.



— Existing Northeast Corridor Existing North River Tunnel

0 5,000 FEET

electrically powered trains, and extends approximately 2.5 miles from the tunnel portal in North Bergen to PSNY.

In October 2012, Superstorm Sandy inundated the North River Tunnel and today the tunnel remains compromised. The North River Tunnel is currently safe for use by Amtrak and NJ TRANSIT trains traveling between New Jersey and New York City and beyond. However, it is in poor condition as a result of the storm damage and has required emergency maintenance that disrupts service for hundreds of thousands of rail passengers throughout the region. Despite the ongoing maintenance, the damage caused by the storm continues to degrade systems in the tunnel and can only be addressed through a comprehensive reconstruction of the tunnel.

Since completion of the DEIS, the COVID-19 global health crisis has resulted in substantial decreases in the number of people traveling by rail. Any evaluation of the long-term implications of the COVID-19 global health crisis at this time would be speculative; therefore, this EIS assumes that in the long-term, rail ridership will recover and return to previous levels. While Amtrak has reduced some service during the COVID-19 global pandemic, NJ TRANSIT continues to operate at its normal service volumes.

The Project would rehabilitate the North River Tunnel without disrupting existing levels of train service, and provide redundant capability for rail service crossing the Hudson River. To perform the needed rehabilitation in the existing North River Tunnel, each tube of the tunnel will need to be closed for more than a year. If no new Hudson River rail crossing is provided, closing a tube of the existing tunnel for rehabilitation would reduce the number of trains that could serve PSNY to a fraction of current service, because the single remaining tube would have to support two-way service. For that reason, to ensure rehabilitation is accomplished without notable reductions in weekday service, the Project would include construction of two new rail tubes beneath the Hudson River (the Hudson River Tunnel) that can maintain the existing level of train service while the damaged North River Tunnel tubes are taken out of service one at a time for rehabilitation. Once the North River Tunnel rehabilitation is complete, both the old and new tunnels will be in service, providing redundant capability and increased operational flexibility for Amtrak and NJ TRANSIT.

1.2 PROJECT BACKGROUND

The existing North River Tunnel is located on the NEC. The NEC is the most heavily used passenger rail line in the U.S., both in terms of ridership and service frequency. The NEC extends from Washington, D.C., in the south to Boston, Massachusetts, in the north, serving the densely populated Northeast region, including PSNY. Amtrak, the nationwide intercity passenger rail operator, operates over the entire NEC, providing regional service, long distance service, and high-speed Acela Express service. Amtrak owns the majority of the NEC, including the portion in New Jersey and the North River Tunnel. NJ TRANSIT operates an extensive commuter rail network in New Jersey that extends to Philadelphia, Pennsylvania; Orange and Rockland Counties in New York; and New York City. In New Jersey, NJ TRANSIT owns much of the commuter rail network that converges on the NEC. NJ TRANSIT's rail lines all include direct or connecting service to PSNY. **Figures 1-2 and 1-3** illustrate the NEC and NJ TRANSIT routes that serve PSNY via the North River Tunnel.

Amtrak's NEC service and NJ TRANSIT's commuter rail service provide connections between the major cities of the Mid-Atlantic and Northeast states and commuter access for thousands of people who work in the region. Therefore, both services are important to the region's economy. The Tier 1 Final EIS for the NEC FUTURE program, described in more detail below in Section 1.2.3, describes the importance of the NEC to the region's economy:

The Northeast regional economy, which approximates the Northeast and Mid-Atlantic regions, is unique among U.S. regional economies in that it is the most



-  Existing North River Tunnel
-  Rail Station (not all shown)
-  Northeast Corridor
-  Connecting Rail Corridor
-  National Rail Network

0 50 MILES



Amtrak Northeast Corridor and Connecting Rail Network
Figure 1-2



http://www.njtransit.com/portal/rail/System_Map.pdf

LEGEND

- Train
- Transfer Station
- Station
- Light Rail
- PATH/PREDCO Services
- Accessible Station
- Ferry Connection
- Transfer required to New York

No Smoking permitted at NJ TRANSIT Stations and Platforms
 PATH/PREDCO Services
 NJ TRANSIT Information (973) 275-5555
 NJ TRANSIT Telephone Text (800) 772-2287
 NJ TRANSIT Security Hotline (888) TIPS NJT or (888) 847-7658
 Text Tips to NJTPD (65873)
 NJ TRANSIT Mobile App

NJ TRANSIT Information
 (973) 275-5555

NJ TRANSIT Telephone Text
 (800) 772-2287

NJ TRANSIT Security Hotline
 (888) TIPS NJT
 or
 (888) 847-7658
 Text Tips to NJTPD (65873)

Atlantic City Line

Atlantic City

BUY YOUR TICKET
 WITH YOUR PHONE
 DOWNLOAD THE FREE NJ TRANSIT MOBILE APP

NON-DISCRIMINATION POLICY:
 NJ TRANSIT is committed to ensuring that no person is excluded from, or denied the benefits of our services on the basis of race, color, or national origin as protected by Title VI of the Civil Rights Act of 1964, as amended. No person or group of persons shall be discriminated against with regards to the routing, scheduling, or quality of transportation service on the basis of race, color, or national origin. Any person who believes that they have, individually, or as a member of any specific class of persons, been subjected to discrimination on the basis of race, color, or national origin, or wishes to obtain additional information regarding NJ TRANSIT's Title VI obligations, may file a complaint or inquiry in writing to NJ TRANSIT Customer Service Title VI Division, One Penn Plaza East, Newark, NJ 07102. A complaint must be filed within 180 days of the alleged discrimination.



NJ TRANSIT Commuter Network Figure 1-3



densely urban region in the United States, with the NEC connecting some of the nation's largest and most mature urban economies. . . . The region's infrastructure has some of the oldest assets in the nation's transportation network. To maintain its role as a global economic center, the region must modernize its aging infrastructure and add capacity to support future growth. Absent the ability to efficiently move large numbers of people in, out, and between these large economic centers daily, the negatives of large metropolitan economies begin to cancel the positives, tempering economic development and incentivizing businesses to expand elsewhere in the United States.⁵

Recent census data indicate that in 2015, 13.3 percent of the workforce in Manhattan consists of residents of New Jersey and 7.8 percent of all New Jersey workers commute to Manhattan.⁶ In its 2017 Fiscal Year, Amtrak carried approximately 20,900 weekday passenger trips (one-way ride) each day on more than 100 trains between New York and New Jersey, not counting passengers who traveled through the North River Tunnel and PSNY but did not get off or on at PSNY. In its 2017 Fiscal Year, NJ TRANSIT carried approximately 189,000 weekday trips each day on approximately 350 trains between New York and New Jersey.

Extensive engineering work and environmental documentation have been prepared over the past two decades for a new Hudson River rail tunnel as part of efforts to improve passenger rail service in the region, and ongoing work continues related to preservation and expansion of service. Relevant past and ongoing studies include those for the Access to the Region's Core (ARC) Project, the Gateway Program, and the NEC FUTURE program. These initiatives are described in the following sections.

1.2.1 ACCESS TO THE REGION'S CORE (ARC) PROJECT

Detailed studies and design were conducted for the ARC Project from 1995 through 2010, including a Draft, Supplemental Draft, and Final EIS, as well as supplemental studies after completion of the EIS in support of the project's construction. These studies evaluated several options for construction of a new tunnel under the Hudson River in combination with an expansion of station capacity in midtown Manhattan to accommodate growing passenger demand. The final selected alternative for the ARC Project included two additional tracks from Secaucus Junction Station, alongside the NEC in the Meadowlands, through a tunnel beneath the Palisades and under the Hudson River, to a new station in Manhattan under West 34th Street between Sixth and Eighth Avenues. It included a loop track at Secaucus to connect NJ TRANSIT's Hoboken Division lines to the NEC; and a new midday rail storage yard in Kearny. The combination of these improvements and the purchase of new rolling stock would have allowed NJ TRANSIT to increase service throughout its system substantially, with peak hour service to Midtown doubled. The improvements also would have created additional peak-hour capacity for Amtrak; Amtrak planned to add one train during the peak hour each day.

While the ARC Project included many of the same elements as the Hudson Tunnel Project's Preferred Alternative, its purpose was to allow an increase in rail passenger capacity; it did not connect to PSNY and did not include rehabilitation of the North River Tunnel. The project was canceled in 2010 shortly after initial construction had begun. FRA and NJ TRANSIT have used materials developed as part of the ARC Project's NEPA review to provide baseline information for the study of the Project, as appropriate.

⁵ FRA, NEC FUTURE Tier 1 Final EIS, December 2016, Volume II, pp. 6-2 and 6-3, available at https://www.fra.dot.gov/necfuture/tier1_eis/feis/volume_2/chapter_06.aspx.

⁶ U.S. Census Bureau. 2018. OnTheMap Application. Longitudinal-Employer Household Dynamics Program. <http://onthemap.ces.census.gov/>.

1.2.2 GATEWAY PROGRAM

The Gateway Program is a comprehensive program of phased strategic rail infrastructure improvements designed to preserve and improve current services and create new capacity that will allow the doubling of passenger trains on the NEC between Newark, New Jersey, and PSNY. The objective of the Gateway Program is two-fold: (1) to update and modernize existing infrastructure and repairs to infrastructure elements that are damaged due to age or events such as Superstorm Sandy; and (2) to increase track, tunnel, bridge, and station capacity, eventually creating four mainline tracks between Newark and PSNY to allow the doubling of passenger trains in this section of the NEC. The individual projects that make up the Gateway Program will advance through planning, environmental review, funding, and construction separately; some of these projects are approved for construction while others are in the planning stages. The Gateway Program is in the planning and design phase, but certain projects that are components of the Gateway Program, including the Hudson Tunnel Project and the Hudson Yards Right-of-Way Preservation Project, are proceeding ahead of the rest of the program as critical infrastructure projects with independent utility. As appropriate, FRA and NJ TRANSIT have used the work conducted for the Gateway Program Feasibility Study to provide baseline information for the study of the Project.

1.2.3 NEC FUTURE

In 2012, FRA launched NEC FUTURE to consider the role of rail passenger service in the context of current and future transportation demands and to evaluate the appropriate level of capacity improvements to make across the NEC. The intent of the NEC FUTURE program is to help develop a long-term vision and investment program for the NEC. Through NEC FUTURE, FRA evaluated overall capacity improvements and environmental consequences associated with improved NEC rail services, including trans-Hudson service. However, as described above, the Hudson Tunnel Project addresses a specific need related to deterioration of the existing North River Tunnel and so it is considered independently from the other projects analyzed in the NEC FUTURE EIS. FRA released the NEC FUTURE Tier 1 Final EIS in December 2016. The Preferred Alternative evaluated in the Tier 1 Final EIS consisted of an investment program that grows the role of rail by identifying numerous upgrades and state-of-good-repair projects along the length of the NEC.

In July 2017, FRA issued the ROD for the NEC FUTURE program, which completed the Tier 1 environmental review process under NEPA. The ROD documents FRA's formal selection of an investment program for the NEC, referred to as the Selected Alternative. The Selected Alternative is a refinement of the Preferred Alternative identified in the Tier 1 Final EIS and represents a vision for the NEC that will serve as a framework to help prioritize, facilitate, and expedite investment in the NEC for the next several decades. It is a corridor-wide commitment to the NEC to bring it to a state of good repair and provide additional capacity and service enhancements to address passenger rail needs for the future. To achieve this vision, the Selected Alternative includes the following four components:

- *Improve Rail Service:* Corridor-wide service and performance objectives for frequency, travel time, design speed, and passenger convenience.
- *Modernize NEC Infrastructure:* Corridor-wide repair, replacement, and rehabilitation of the existing NEC to bring the corridor into a state of good repair and increase reliability.
- *Expand Rail Capacity:* Additional infrastructure between Washington, D.C., and New Haven, Connecticut, and between Providence, Rhode Island, and Boston, Massachusetts, as needed to achieve the service and performance objectives, including investments that add capacity, increase speeds, and eliminate chokepoints.



- *Study New Haven to Providence Capacity:* Planning study in Connecticut and Rhode Island to identify additional on- and off-corridor infrastructure as needed to achieve the service and performance objectives.

Currently, the Northeast Corridor Commission, formed to facilitate collaborative planning (among other responsibilities) and comprised of representatives from each of the eight Northeast Corridor states, the District of Columbia, Amtrak, and the USDOT, is leading the development of a plan to implement the NEC FUTURE Selected Alternative, called CONNECT NEC 2035. The NEC FUTURE Selected Alternative is consistent with the Hudson Tunnel Project and it, as well as CONNECT NEC 2035, includes new Hudson River tunnel investments similar to the Preferred Alternative.

1.2.4 PROJECT'S RELATIONSHIP TO PROPOSED CAPACITY ENHANCEMENT

The North River Tunnel's peak-hour operation, with a total of 24 Amtrak and NJ TRANSIT trains in each direction during the morning and evening peak hours, is the maximum current capacity for the tunnel, due to the existing constraints at PSNY and elsewhere on the NEC between Newark, New Jersey and PSNY.

PSNY provides access to New York City for passenger railroad trains operated by Amtrak, NJ TRANSIT, and the Metropolitan Transportation Authority (MTA) Long Island Rail Road (LIRR). The station operates both as a through station for Amtrak and as a terminal station for all three railroads. Prompted by the growing demand for passenger rail service to and from Manhattan in recent decades, over the past several years the three railroads have regularly performed extensive operations analysis and have implemented infrastructure improvements that have allowed the railroads to increase service capacity and frequency. The three railroads fully use the capacity of the tracks and platforms within PSNY during peak hours. There is no additional capacity to process trains at the platforms, given the time required for trains to wait at the platform for passengers to board and alight, and to move through the station during peak periods. In addition, no peak-period capacity is available to route additional trains beyond PSNY through the East River Tunnels either for passenger (i.e., revenue) service or for midday storage in Sunnyside Yard in Queens, and there is limited storage capacity within the PSNY complex itself. Therefore, ultimately, no increase in rail capacity between Newark Penn Station and PSNY can occur until substantial infrastructure improvements, such as those considered as part of NEC FUTURE or the Gateway Program, are built.

The Hudson Tunnel Project would double the number of tracks on the NEC between Frank R. Lautenberg Secaucus Junction Station in New Jersey and the PSNY approach tracks at approximately Ninth Avenue in Manhattan. With the Preferred Alternative, there would be four tracks through this section of the NEC rather than two. Ultimately, the increase in rail service capacity between Secaucus and PSNY would be one element of a larger program to increase rail service capacity on the NEC between Newark, New Jersey and New York City described above. However, while the Hudson Tunnel Project would increase the number of tracks between Secaucus and PSNY, it would not result in an increase in rail service until other improvements such as those included in NEC FUTURE and the Gateway Program occur.

As explained in Section 1.4, a new Hudson River crossing on the NEC is urgently needed to maintain existing service. While the Project addresses maintenance and resilience of the NEC Hudson River crossing, it would not increase rail capacity and therefore would not facilitate an increase in rail service. This future need, while important, is not part of the purpose or scope of the Hudson Tunnel Project, and an increased scope required to address the future need for increased capacity as part of the Proposed Action would result in unacceptable delays to the implementation of the tunnel rehabilitation project. At the same time, the Project would not

preclude other future projects to expand rail capacity in the area. Accordingly, while the Project may be an element of a larger future program to expand rail capacity, it would meet an urgent existing need and is being evaluated as a separate project from any larger initiative. As explained above, ultimately, an increase in peak-period rail capacity and train service between Newark Penn Station and PSNY cannot be realized until other substantial infrastructure capacity improvements are built. These improvements would be the subject of one or more separate design, engineering, and environmental reviews, as appropriate.

Because of the importance of the NEC Hudson River crossing to essential commuter and intercity rail service between New Jersey and New York, the Project is time-sensitive and needs to be accomplished as soon as possible. Therefore, this Project to address the need related to deterioration of the existing North River Tunnel is being advanced independently of any initiatives to expand rail capacity on the NEC, but does not preclude other future projects to expand rail capacity in the area.

1.3 PROJECT PURPOSE

The purpose of the Hudson Tunnel Project is: to preserve the current functionality of Amtrak's NEC service and NJ TRANSIT's commuter rail service between New Jersey and PSNY by repairing the deteriorating North River Tunnel; and to strengthen the NEC's resiliency to support reliable service by providing redundant capability under the Hudson River for Amtrak and NJ TRANSIT NEC trains between New Jersey and the existing PSNY. These improvements must be achieved while maintaining uninterrupted commuter and intercity rail service and by optimizing the use of existing infrastructure.

1.4 PROJECT NEED

The existing North River Tunnel is a critical NEC asset and is the only intercity passenger rail crossing into New York City from New Jersey and areas west and south.⁷ This tunnel, constructed between 1904 and 1908 and opened for service in 1910, is more than 100 years old and was designed and built to early 20th-century standards. Service reliability through the tunnel, already suboptimal because of the tunnel's age and antiquated standards, has been further compromised because of the damage to tunnel components caused by Superstorm Sandy.

1.4.1 NEED TO REHABILITATE THE NORTH RIVER TUNNEL

Superstorm Sandy inundated both tubes in the North River Tunnel with seawater in October 2012, resulting in the cancellation of all Amtrak and NJ TRANSIT service into New York City for five days. Seawater rose to above the top of rail for approximately 3,200 feet of the tunnel's north tube and 2,300 feet of the south tube. The flood level reached above the height of the bench walls at the tunnel's lowest point.⁸ The bench walls were inundated for approximately 1,900 feet in the north tube and 800 feet in the south tube. While the tunnel was restored to service and is now safe for travel, chlorides from the seawater remain in the tunnel's concrete liner, bench walls, and

⁷ As shown in **Figure 1-3**, the PANYNJ's Port Authority Trans Hudson (PATH) rail service also crosses the Hudson River, serving local New Jersey and New York commuters rather than intercity or regional commuters.

⁸ The bench wall is a ledge along a tunnel's side wall that can serve as a walkway for maintenance and emergency use; the bench wall also houses ducts that contain electrical wiring, equipment, cables, and other essential equipment. The North River Tunnel has two bench walls, one on each side.



ballast, causing ongoing damage to these elements as well as to embedded steel, track and third rail systems, and signaling, mechanical and electrical components.⁹

The most serious damage affects the concrete bench walls, which run the length of the tunnel and provide emergency egress and maintenance and first responder access to trains and track. Ducts housed inside the bench walls contain electrical wiring, utility cables, and other essential equipment, including high-voltage feeder cables that provide traction power (i.e., power for trains) for the PSNY complex. The bench walls have longitudinal cracks, severe spalls with exposed steel, and corrosion of embedded steel elements, all of which were created by or exacerbated by the seawater inundation. The continuous bench walls and duct work cannot perform reliably or be repaired. While the tunnel is structurally sound and safe for continuing passenger rail use, these conditions necessitate that the existing bench walls be replaced. These should be constructed at the proper height to meet current fire-life safety standards (National Fire Protection Association (NFPA) 130). This replacement should occur portal to portal, since it is not practical to construct the middle portion of a bench wall at different height than the two ends, given that the bench wall operates as one continuous system providing emergency egress and housing duct work inside.

In addition, the North River Tunnel's ballasted trackbed is coated with chlorides remaining from the seawater that flooded the tunnel. The existing rail system in the North River Tunnel consists of rock ballast, treated timber ties, running rail and third rail. Full removal of the chlorides from the ballast, including from the inaccessible surfaces, is not physically possible; therefore, the ballast needs to be entirely removed. This requires removal of the tie and rail systems as well, in order to remove the ballast. Moreover, the ballasted track is a leading cause of train delays and a major contributor to the lack of reliability. The heavy train traffic in the tunnel causes the ballast to degrade at an accelerated pace. As the ballast degrades, this creates fine dust and debris that lead to clogs and water retention as well as pump damage. Water retention results in wet ballast, which short circuits the track, creating false signals that lead to one of the major causes of train delays in the North River Tunnel. Degradation of the ballasted track components (perishable wood ties and ballast) can also affect the geometry of the track, which leads to poor ride quality, more wheel and rail wear and increased impact on the truck assemblies. Most major tunnel rail systems worldwide now use either a type of direct fixation track or concrete-embedded traditional ties, rather than ballasted track. The North River Tunnel needs replacement of the ballasted trackbed with a new direct fixation track system and track drainage system to address these issues.

In addition, the areas of the tunnel liner behind the bench walls and beneath the tracks and ballast are currently not accessible, because of their location behind those permanent features. Localized repairs on the existing tunnel lining are needed to address leaks, cracks, and spalls, including areas that are currently inaccessible beneath the ballast and behind the bench walls.

The damage caused by Superstorm Sandy is compounded by the tunnel's age and the intensity of its current use, resulting in frequent delays due to component failures within the tunnel. The damage to the bench walls and ballast and track systems necessitates full portal-to-portal replacement of these elements, which form integrated systems running the length of the tunnel. Moreover, both systems would need to be reconstructed to meet modern standards including fire and life safety; it would be both impractical and unsafe to reconstruct a portion of either system to a higher standard while other portions remain constructed to an older, incompatible standard.

Given the unanticipated delays to the construction schedule for the Project, in 2020, Amtrak began the North River Tunnel Interim Reliability Improvements Program to accelerate immediate

⁹ HNTB. *Structural Assessment of the Amtrak Under River Tunnels in NYC Inundated by Super Storm Sandy*. September 2014. Available at: www.amtrak.com/content/dam/projects/dotcom/english/public/documents/corporate/reports/Amtrak-NYC-Tunnels-Assessment-Report.pdf.

maintenance and repair in the tunnel prior to its full rehabilitation. Through that program, Amtrak is examining options for a variety of repairs and improvements to the North River Tunnel with the goal of improving safety and reliability for the public over the next decade in advance of comprehensive rehabilitation. Measures that Amtrak identifies for implementation will advance into preliminary engineering, followed by construction beginning in 2022. Improvements that do not require advanced design will commence sooner. Amtrak expects that targeted interventions developed through this program can temporarily mitigate many of the maintenance issues in the North River Tunnel that result in train delays, but they cannot deliver the comprehensive rehabilitation of the North River Tunnel contemplated as part of the Hudson Tunnel Project and necessary for the long-term preservation and safe use of the tunnel. Amtrak states that the improvements that they will implement as part of the North River Tunnel Interim Reliability Improvements Program will substantially improve rail operations through the tunnel in the near term, but will not eliminate the need for a complete rehabilitation of the North River Tunnel in the long term to address safety concerns and the damage and ongoing deterioration caused by Superstorm Sandy.

1.4.2 NEED TO MAINTAIN EXISTING PASSENGER RAIL SERVICE

Prior to the COVID-19 global pandemic, the existing two-track North River Tunnel was operating at its full peak-hour capacity in the morning and evening peak periods, without redundancy for reliable train operations during disruptions or maintenance. Any service disruption therefore results in major passenger delays and substantial reductions to overall system flexibility, reliability and on-time performance. With no other Hudson River passenger rail crossing into PSNY, single-point failures can suspend rail service, causing delays that cascade up and down the NEC and throughout NJ TRANSIT's commuter system, disrupting service for hundreds of thousands of passengers. For example, such a failure occurred on April 14, 2017, when a power outage in one of the tunnel's tubes during the evening peak period stranded approximately 1,200 passengers in a NJ TRANSIT train in the tunnel for several hours and resulted in cascading delays to Amtrak, NJ TRANSIT, and Long Island Rail Road trains headed into and out of PSNY that evening.

This condition is exacerbated by the need to perform increased maintenance to address damage caused by Superstorm Sandy. These maintenance demands are difficult to meet because of the intensity of rail service in the tunnel. Efforts to maintain the North River Tunnel in a functional condition currently require frequent nightly and weekend tunnel outages with reductions in service due to single-track operations. To allow for these regular maintenance activities, Amtrak and NJ TRANSIT operate with an adjusted, reduced schedule on weekends to allow one tube of the North River Tunnel to be closed on weekends for a 55-hour window beginning on Friday evening and ending early on Monday morning. This revised schedule has substantially fewer trans-Hudson trains than the regular weekend schedule prior to the adjustment and constrains NJ TRANSIT's ability to serve current customer demand for weekend travel. Despite the ongoing maintenance, including the Interim Reliability Improvements Program, service disruptions will continue to occur, and over time will happen more frequently as the deterioration related to the seawater inundation continues and components fail in an unpredictable manner.

Because of the importance of the North River Tunnel to essential commuter and intercity rail service between New Jersey and New York City, rehabilitation of the existing North River Tunnel needs to be accomplished without notable reductions in weekday service.

Removing one tube in the existing North River Tunnel from operation without new redundant capability in place would reduce weekday service to volumes well below the current maximum capacity of 24 trains per hour in the peak direction. Such a scenario would reduce tunnel capacity by well over 50 percent due to the need to accommodate two-way service on the single remaining track. The theoretical best case scenario for single-track operation would provide nine trains per hour in the peak direction (a 63 percent reduction in peak direction service), but even this reduced



level of service represents throughput under perfect operating conditions, and is therefore higher than what would be expected in a real-world operating environment. Such a dramatic reduction in service levels would force many rail passengers to switch to alternate modes of transportation for several years until rehabilitation work is complete and full service is restored. Because all trans-Hudson transportation routes and services were operating at or near capacity during peak travel hours (prior to COVID-19), public transportation services paralleling the North River Tunnel (PATH trains, commuter buses, and ferries) would experience extreme overcrowding and delays and many passengers might elect not to make the trip or to travel via automobile on the region's congested roadway system. Those passengers who choose to continue using passenger rail service through the North River Tunnel could face potentially unsafe levels of overcrowding on trains and station platforms. Furthermore, if the single remaining available track were forced to close for an emergency repair, all trans-Hudson passenger rail service would have to be suspended for the duration of the emergency closure. Based on existing ridership prior to the COVID-19 global health crisis,¹⁰ a full closure of the North River Tunnel would disrupt up to 20,900 daily weekday Amtrak passenger trips (one-way rides) and up to 189,000 daily weekday NJ TRANSIT passenger trips, on up to approximately 500 trains per day, as a worst-case scenario. In addition, Amtrak passengers who travel through the North River Tunnel and PSNY but do not get off or on at PSNY would also be affected. This scenario would have wide-ranging negative effects on local, regional, and national travel patterns and economic activity and on regional environmental conditions.

1.4.3 SUMMARY

In summary, the Hudson Tunnel Project will address the following critical needs:

- *Improve the physical condition and rehabilitate the existing North River Tunnel:* Both tubes in the North River Tunnel were inundated with seawater during Superstorm Sandy in October 2012, resulting in the cancellation of all Amtrak and NJ TRANSIT service into New York City for five days. The more than 100-year-old North River Tunnel, already in need of repair due to its age, has been further compromised as a result of the storm damage and service reliability has suffered.
- *Preserve existing NEC capacity and functionality during rehabilitation of existing North River Tunnel:* The need to maintain existing levels of rail service is critical as it supports intercity, regional, and local mobility and associated economic benefits regionally and nationally.
- *Strengthen the NEC's resiliency to support reliable service by providing redundant capability at the critical Hudson River crossing, so as to reduce commuter and intercity rail delays caused by unanticipated events or routine maintenance:* The lack of redundant capability across the Hudson River means that any service outage, either unplanned or for planned maintenance, results in substantial reductions to NEC reliability and on-time performance. Once the Project is constructed, maintenance can take place without these service disruptions.

¹⁰ Reflecting conditions prior to March 2020, when the COVID-19 global health crisis resulted in substantial decreases in the number of people using rail. This EIS does not assess the long-term implications of the COVID-19 global health crisis, since any evaluation at this time would be speculative. This EIS assumes that in the long-term, commuting patterns will recover and return to their previous levels.

1.5 GOALS AND OBJECTIVES

FRA and NJ TRANSIT established five goals and related objectives to address the Project purpose and need. The objectives further define the goals and provide specific and measurable means by which to evaluate the Project alternatives.

- Goal 1:** Improve service reliability and upgrade existing tunnel infrastructure in a cost-effective manner.
- Objective 1.1: Reduce infrastructure-related delays due to poor condition of the North River Tunnel following Superstorm Sandy.
 - Objective 1.2: Rehabilitate the North River Tunnel to modern system standards.
- Goal 2:** Maintain uninterrupted existing NEC service, capacity, and functionality by ensuring North River Tunnel rehabilitation occurs as soon as possible.
- Objective 2.1: Optimize use of existing infrastructure.
 - Objective 2.2: Use conclusions from prior planning studies as appropriate and to the maximum extent possible.
 - Objective 2.3: Avoid regional and national economic impacts associated with loss of rail service.
- Goal 3:** Strengthen the NEC's resiliency to provide reliable service across the Hudson River crossing, facilitating long-term infrastructure maintenance and enhancing operational flexibility.
- Objective 3.1: Construct additional tracks to allow for continued NEC rail operations during maintenance periods and unanticipated human-caused and natural events.
- Goal 4:** Do not preclude future trans-Hudson rail capacity expansion projects.
- Objective 4.1: Allow for connections to future capacity expansion projects, including connections to Secaucus Junction Station through to the Portal Bridge over the Hackensack River, and connections to station expansion projects in the area of PSNY.
- Goal 5:** Minimize impacts on the natural and built environment.
- Objective 5.1: Avoid/minimize adverse impacts on communities and neighborhoods.
 - Objective 5.2: Strive for consistency with local plans and policies.
 - Objective 5.3: Preserve the natural and built environment to the extent practicable.

*