NEC FUTURE

A Rail Investment Plan for the Northeast Corridor

RECORD OF DECISION

JULY 2017

U.S. Department of Transportation
Federal Railroad Administration

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A Rail Investment Plan for the Northeast Corridor

Washington, D.C., to Boston, Massachusetts

July 2017

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U.S. Department of Transportation
Federal Railroad Administration

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Acronyms

ADA ..... Americans with Disabilities Act
B&P ..... Baltimore & Potomac (Tunnel)
BWI ..... Baltimore-Washington International
CDOT ..... Connecticut Department of Transportation
CEQ ..... Council on Environmental Quality
EIS ..... Environmental Impact Statement
FRA ..... Federal Railroad Administration
FTA ..... Federal Transit Administration
LIRR ..... Long Island Rail Road
MARC ..... Maryland Area Regional Commuter
MBTA ..... Massachusetts Bay Transportation Authority
MPO ..... metropolitan planning organizations
MTA ..... (New York) Metropolitan Transportation Authority
NEC ..... Northeast Corridor
NEPA ..... National Environmental Policy Act
NMFS ..... National Marine Fisheries Service
NRTC ..... Newark Delaware Regional Transportation Center
O&M ..... operations and maintenance
PATH ..... Port Authority Trans-Hudson
PSNY ..... Penn Station New York
ROD ..... Record of Decision
SDP ..... Service Development Plan
SEHSR ..... Southeast High-Speed Rail
U.S. DOT ..... United States Department of Transportation
USFWS ..... United States Fish and Wildlife Service
USGS ..... United States Geological Service
VMT ..... vehicle-miles traveled
VRE ..... Virginia Railway Express

Summary

This Record of Decision (ROD) documents the Federal Railroad Administration's (FRA) decision regarding NEC FUTURE, a comprehensive planning effort to define a vision for the future role of passenger rail service on the Northeast Corridor (NEC) through 2040 and beyond. The NEC is the rail transportation spine of the Northeast region—extending from Union Station in Washington, D.C., to South Station in Boston, MA—and is a key component of the region's transportation system. This ROD documents the FRA's selection of an investment program for the NEC and describes how this investment program will be advanced.

The purpose of NEC FUTURE is to upgrade aging infrastructure and to improve the reliability, capacity, connectivity, performance, and resiliency of future passenger rail service on the NEC for both Intercity and Regional trips,[1] while promoting environmental sustainability and continued economic growth. In this ROD, the FRA is making a decision to select a corridor-wide vision for the NEC that encompasses improvements to grow the role of rail within the transportation system of the Northeast (the Selected Alternative). To achieve this Grow 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, CT, and between Providence, RI, and Boston, MA, 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.

The Selected Alternative prioritizes a corridor-wide commitment to the existing NEC, brings it to a state of good repair, and provides the additional capacity and service enhancements necessary to address passenger rail needs through 2040 and beyond.

[1] Intercity is passenger rail service between metropolitan areas. Regional describes travel within a metropolitan area.

1. Introduction

This Record of Decision (ROD) documents the Federal Railroad Administration's (FRA) decision regarding NEC FUTURE, a comprehensive planning effort to define a vision for the future role of passenger rail service on the Northeast Corridor (NEC) through 2040 and beyond. The NEC is the rail transportation spine of the Northeast region—extending from Union Station in Washington, D.C., to South Station in Boston, MA—and is a key component of the region's transportation system. This ROD documents the FRA's selection of an investment program that will substantially grow the role of rail on the NEC and across the Northeast, helping to provide the transportation services necessary to maintain a vibrant and competitive economy in the Northeast region.

The FRA prepared this ROD in accordance with the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. § 4321 et seq.), the Council on Environmental Quality's (CEQ) regulations implementing NEPA (40 C.F.R. Parts 1500-1508), the FRA's Procedures for Considering Environmental Impacts (64 Fed. Reg. 28545, May 26, 1999), and the FRA's Update to NEPA Implementing Procedures (78 Fed. Reg. 2713, January 14, 2013).

The FRA sponsored the NEC FUTURE program to comprehensively plan for corridor-wide improvement of the NEC and the region's passenger rail network. During this process, the FRA worked closely with and listened to stakeholders from across the region including the NEC states,[2] federally recognized Indian tribes, communities along the NEC, railroad operators, federal and state resource and regulatory agencies, and regional planning organizations. In making its decision, the FRA considered the information and analysis detailed in the Tier 1 Draft and Final Environmental Impact Statements (including associated reports, studies, and data), public and stakeholder comments, and U.S. Department of Transportation (U.S. DOT) and FRA policy objectives.

For the NEC FUTURE Tier 1 EIS process, the FRA invited the Federal Transit Administration (FTA) to be a cooperating agency because of its likely involvement in the implementation of the NEC FUTURE Selected Alternative (for example, as a funding source for a Tier 2 project) and for its expertise related to commuter rail operations along the NEC. The FTA agreed to be a cooperating agency; their participation is essential to advancing this program in a coordinated manner. As a cooperating agency, the FTA may elect to adopt the findings of, or a portion thereof, of the Tier 1 Final EIS for the proposed action and issue its own ROD, pursuant to 40 CFR 1506.3 or other applicable authorities, as appropriate. Such action by FTA likely would occur when FTA has a funding role in the advancement of a project on the NEC. The FRA will continue to collaborate with the FTA to address consistency of projects (for which FTA provides funding) with the Selected Alternative.

[2] NEC states refers to Maryland, Delaware, Pennsylvania, New Jersey, New York, Connecticut, Rhode Island, and Massachusetts, and Washington, D.C.

In accordance with NEPA, the FRA, as the lead federal agency, issued a Tier 1 Draft Environmental Impact Statement (Tier 1 Draft EIS) in November 2015, which evaluated environmental impacts of three Action Alternatives (Maintain, Grow, and Transform) in comparison with the No Action Alternative. The FRA issued a Tier 1 Final EIS in December 2016, which identified a Preferred Alternative.

In consideration of the technical analyses in the Tier 1 Draft EIS and the Tier 1 Final EIS, public and stakeholder comments on the Preferred Alternative, and U.S. DOT and FRA policy objectives, the FRA selects a Grow Vision as the Selected Alternative, which is a modified version of the Preferred Alternative described in the Tier 1 Final EIS. The Selected Alternative will substantially meet the market demand for passenger rail travel and accommodate the anticipated growth in population and employment and other economic activity in the Northeastern region of the United States.

This ROD is organized as follows: Section 2 presents background on the NEC FUTURE program, including all the alternatives considered as part of NEC FUTURE, a discussion of the feedback received on the Tier 1 Final EIS, and the FRA's rationale for its decision regarding the Selected Alternative. Section 3 describes the Selected Alternative, such as the corridor-wide service objectives and infrastructure elements, state-specific infrastructure elements, and future capacity planning study. Section 4 summarizes the environmental effects of the Selected Alternative and identifies potential measures to avoid and minimize harm. Sections 5 and 6 discuss the agency roles and responsibilities to advance the Selected Alternative, and agency and public coordination. Section 7 is the conclusion and the signature page. Additional materials considered by the FRA in making its decision—including specific details about the decision organized by geography, a summary of feedback received, individual feedback submissions, and corrections and clarifications to the Tier 1 Final EIS—are included as appendices to this document.

2. NEC FUTURE Program

NEC FUTURE is a comprehensive planning effort to consider the future role of passenger rail service on the NEC in the context of current and future transportation demands. Initiated by the FRA in February 2012, NEC FUTURE establishes a framework for future investment in the corridor through 2040 and beyond. NEC FUTURE includes the development of a Tier 1 EIS in compliance with NEPA and a Service Development Plan (SDP), which the FRA will prepare with the NEC Commission and other stakeholders after the ROD to serve as a roadmap for implementation of the Selected Alternative. The FRA released the Tier 1 Draft EIS in November 2015 and the Tier 1 Final EIS in December 2016. While NEC FUTURE focuses on passenger rail, it also considers the interrelationship of freight rail operations and passenger rail.

Passenger Rail includes the following:

- **Intercity** is passenger rail service between metropolitan areas.
- **Regional** describes travel within a metropolitan area. "Regional rail" is passenger rail service within the travel shed of a metropolitan area. "Regional rail" provides local and commuter-focused service characterized by a high-percentage of regular travelers. Regional rail is a broad term that reflects the expanded role of commuter railroads to also serve metropolitan travel needs throughout the day and beyond the work week.

With NEC FUTURE, the FRA determines a long-term vision for improved passenger rail on the NEC, encompassing Intercity and Regional rail services, and an incremental approach to accomplish that vision. The NEC FUTURE vision upgrades aging infrastructure and expands capacity to accommodate and support the significant population and employment growth projected in the region. **The incremental implementation approach allows stakeholders to prioritize immediate, critical needs along the NEC and to continue to plan for future investment in those areas where needs are less urgent or where there is need for further study.** The FRA is the lead federal agency for this effort. The FRA is conducting the program in coordination with the FTA (a cooperating agency in the NEPA process); tribal, state, and local governmental jurisdictions along the NEC; passenger and freight railroads; and other stakeholders.

2.1 PURPOSE AND NEED

2.1.1 Purpose Statement

The purpose of NEC FUTURE is to upgrade aging infrastructure and to improve the reliability, capacity, connectivity, performance, and resiliency of future passenger rail services on the NEC for both Intercity and Regional rail trips, while promoting environmental sustainability and continued economic growth.

2.1.2 Need Statement

The NEC FUTURE process focuses on meeting current and future passenger rail transportation needs in the Study Area.[3] For the purposes of analysis, the FRA established a planning horizon of 2040. However, the investments proposed in NEC FUTURE are likely to include infrastructure improvements expected to last well beyond 2040 and into the next century. Therefore, while 2040 is the horizon year, the FRA considered future needs of the NEC beyond the 2040 planning horizon in the development and analysis of alternatives.

The overall needs addressed by NEC FUTURE include aging infrastructure, insufficient capacity, gaps in connectivity, compromised performance, and lack of resiliency. Addressing these needs is essential to support the reliability of the passenger rail system. In addition, the FRA is committed to promoting environmental sustainability and economic growth. The needs are described further below:

- **Aging Infrastructure –** The quality of service on the NEC currently falls short due to the aging and obsolete infrastructure that has resulted from insufficient investment to maintain a state of good repair.
- **Insufficient Capacity –** The NEC cannot meet today's or forecasted future demand due to physical and operational constraints arising from critical infrastructure chokepoints and individual railroad operating practices that are driven primarily by operator-specific policies or local customer needs rather than a consideration of network-wide needs. Growth in passenger travel further exacerbates these constraints.
- **Gaps in Connectivity –** Improved connectivity both between different rail service providers on the NEC rail network and among the different transportation modes is needed to expand the reach and effectiveness of the rail network.
- **Compromised Performance –** Improvements in train frequency, travel time, and fare options are necessary to make passenger rail competitive with other modes. Capacity constraints create a congested passenger rail network, which affects reliability.
- **Lack of Resiliency –** Poor infrastructure, insufficient capacity, and lack of redundancy constrain the NEC's ability to continue to function during unanticipated outages, and catastrophic events, whether weather-related or otherwise. Such resiliency and redundancy are needed to improve reliability of the NEC.

[3] The Study Area includes a broad geographic area, stretching 457 miles from Washington, D.C., in the south, to Boston, MA, in the north, encompassing 50,000 square miles. The analysis of markets and services connecting to the NEC considers areas outside of the Study Area, such as Virginia and New Hampshire. See the Tier 1 Final EIS, Volume 1, Chapter 2.

The FRA places importance on addressing these passenger rail-specific needs, while also considering environmental sustainability and economic growth:

- **Environmental Sustainability –** Expanding the availability of more energy-efficient transportation modes such as passenger rail is necessary to support desired improvements in air quality and environmentally friendly growth patterns.
- **Economic Growth –** Reliable, efficient, and cost-effective movement of passengers and goods is necessary to support continued economic growth in the Study Area.

2.2 ALTERNATIVES CONSIDERED

From the initiation of NEC FUTURE, the FRA encouraged discussion and consideration of a wide range of possible alternatives or future visions for the NEC. The dialogue about markets served and how to offer travelers better rail connections was a priority for the FRA in framing possible alternatives, taking precedence over ideas about specific infrastructure solutions. At the outset of NEC FUTURE, during the Tier 1 EIS public and agency scoping, the FRA identified over 100 different suggestions for service or infrastructure improvements.

The FRA's key findings during the early stage of the alternatives development process related to 1) defining service dynamics—evaluating passenger preferences for frequency of service, trip time, and one-seat-ride services; and 2) defining the role that rail can play in transporting travelers across the NEC region. (The Tier 1 Final EIS, Volume 2, Appendix B, *Preliminary Alternatives Evaluation Report*, provides additional details on this process.)

Service Types

- **Intercity-Express** is premium Intercity rail service operating at speeds of 160–220 miles per hour (mph) on the NEC, making limited stops and only serving the largest markets.
- **Intercity-Corridor** is non-premium Intercity rail service that operates at speeds of 110–160 mph on the NEC and on connecting corridors to markets beyond the electrified territory of the NEC.
- **Regional rail** refers to service concentrated within a single metropolitan region. Regional rail trains provide local and commuter-focused service with a high percentage of regular travelers and typically with fares discounted for weekly or monthly travel.

Through an iterative evaluation process that included technical analyses and public and stakeholder outreach, the FRA ultimately developed three Action Alternatives to evaluate in detail in the Tier 1 Draft EIS. In evaluating the alternatives, the FRA used a number of technical tools (see Tier 1 Final EIS, Volume 2, Appendix B) to assess engineering feasibility, ridership, operational impacts, capital and operating costs, environmental impacts, and public benefits. The level of technical analysis and associated tools to develop applicable data were more detailed as the alternatives advanced through the development process. Additionally, throughout the process, the FRA sought input from stakeholder railroads, states, federal and state resource agencies, regional planning entities, and the public.

This iterative approach to alternatives development allowed for the refinement and re-packaging of elements of alternatives leading to the FRA's identification of the Action Alternatives, which presented a range of future visions for the role of rail in the NEC, to be further analyzed and compared to a No Action Alternative.

2.2.1 No Action Alternative

As a baseline for comparison, consistent with NEPA requirements, the FRA defined and evaluated a No Action Alternative that included planned and programmed improvements to the NEC (see Tier 1 Final EIS, Volume 2, Appendix B). The FRA also incorporated improvements to other transportation modes (e.g., aviation, highway) into the overall analysis of the No Action Alternative. The FRA did not include the associated capital costs of planned/programmed improvements for these other transportation modes.

Several ongoing independent rail projects located within the Study Area—referred to as "Related Projects"—were not included in the No Action Alternative due to their funding status. However, the FRA considered these Related Projects in developing the Action Alternatives and in many cases incorporated them as infrastructure elements. These Related Projects generally fall within one of the following three categories:

- Unfunded or partially funded projects on the NEC with ongoing or completed NEPA analysis and Preliminary Engineering
- Fully or partially funded projects on a connecting corridor but not on the NEC
- Fully or partially funded transit or freight projects located off-corridor, but that connect with the NEC

For the purposes of NEC FUTURE, the FRA assumed that the No Action Alternative could maintain current service levels provided on the NEC; the FRA also assumed that maintaining current service levels would require some additional investment beyond current funding levels. However, even with these assumptions, the No Action Alternative could not achieve a corridor-wide state of good repair, or meet the mobility needs of the Study Area or FRA policy objectives. Moreover, infrastructure that is not in a state of good repair incurs higher risk of unplanned service disruptions with many chokepoints that limit operational flexibility and the ability to recover from service issues. The FRA also considered a disinvestment scenario in which current funding levels do not grow and remain short of what is necessary to maintain current service levels. If funding sufficient to maintain existing service levels is not available, the NEC's reliability, capacity, and service levels will continue to degrade.

2.2.2 Action Alternatives

In the Tier 1 Draft EIS, the FRA defined and developed the Action Alternatives on a programmatic level to focus on corridor-wide solutions. The FRA's approach to the alternatives development

process allowed for consideration of holistic solutions that meet the needs of the entire Study Area, free from constraints on existing physical assets and those imposed by institutional and jurisdictional operating agreements. These alternatives established comprehensive long-term visions for the corridor's future development and are defined by (1) a range of corridor-wide service options (service plans) required to meet varying degrees of projected growth and demand, and (2) infrastructure needed to accommodate the service. Assumptions made at the Tier 1 level were representative and illustrative to support analysis in both the alternatives development process and the Tier 1 Draft EIS.

The Action Alternatives provided a range of options and information to aid in the determination of the appropriate role of rail within the region's future transportation network. While focused on rail solutions (addressing the Purpose and Need), the Action Alternatives had different implications for other transportation modes, including the region's airports, highways, and transit networks. In this way, they allowed policymakers to make decisions with this broader transportation system in mind.

The Action Alternatives represented a range of possible future visions for the Study Area, each intended to capture a different role for passenger rail in the future. The descriptions of the Action Alternatives represented how the NEC could and would be influenced by many variables. The naming (Maintain, Grow, Transform) captured the FRA's intent to have each Action Alternative describe a different role for the future of passenger rail. The specific features of each Action Alternative represented the service and infrastructure investment necessary to achieve three separate visions for passenger rail on the NEC.

The FRA presented the range of possible futures to the public and stakeholders in the Tier 1 Draft EIS to solicit feedback and preferences. Each Action Alternative would require significant investments to achieve its objectives, ranging from simply maintaining the current role that passenger rail plays on the NEC to a much more expansive role. The Action Alternatives presented in the Tier 1 Draft EIS were as follows:

- **Alternative 1 (Maintain)** maintained the role of rail as it is today, with the level of rail service keeping pace with the growth in population in the Study Area. Alternative 1 included new rail services and commensurate investment in the NEC to expand capacity, add tracks, and relieve key chokepoints. Alternative 1 brought the existing NEC to a state of good repair, but did not expand the role of rail beyond its current role in the broader transportation system within the Northeast.
- **Alternative 2 (Grow)** grew the role of rail, expanding rail service at a rate greater than the proportional growth in regional population and employment. Alternative 2 maximized capacity of the existing NEC, eliminated most train operations conflicts, provided additional capacity for improved performance, connected new markets, and removed speed restrictions where practical and safe. Alternative 2 brought the existing NEC to a state of good repair.

- **Alternative 3 (Transform)** transformed the role of rail, supporting trips over longer distances and to places not currently well connected by passenger rail, and positioning rail as the dominant mode for interregional travel to urban centers along the NEC. Alternative 3 included a continuous second spine operating between Washington, D.C., and Boston. The second spine was separate from the existing NEC, but connected to and integrated with services offered on the existing NEC at designated Major Hub and Hub stations. The second spine supported speeds up to 220 mph between major NEC markets and provided additional capacity for Intercity and Regional rail services throughout the Study Area. Alternative 3 also included service and infrastructure improvements on the existing NEC to increase capacity, eliminate chokepoints, and bring the existing NEC to a state of good repair.

2.2.3 Preferred Alternative

In the Tier 1 Final EIS, the FRA identified a Preferred Alternative that would achieve a Grow Vision as described by the service objectives in Alternative 2 and as documented in the Tier 1 Draft EIS. The Preferred Alternative would significantly enhance NEC passenger rail service across the region, providing sufficient capacity to greatly increase service frequency, improve travel time, and increase connectivity between markets on and off the NEC rail network. In contrast to Alternative 2, the Preferred Alternative further prioritized a commitment to the existing NEC over expansion to off-corridor routings, for example by adding capacity between New Haven, CT, and Providence, RI, along the existing route rather than adding a new segment between New Haven and Hartford, CT, and Providence, RI. The Preferred Alternative also included increasing NEC service on the Hartford/Springfield Line.

The Preferred Alternative included investments that would support reliable operations of a substantially larger volume of Intercity and Regional rail services. A conflict-free route was included with opportunities for separate Intercity-Express operations. The technical evaluation indicated that the Grow Vision (which was included in Alternative 2 in the Tier 1 Draft EIS) was the best fit for the range of NEC users and markets served. Similarly, public and stakeholder comments on the Tier 1 Draft EIS overwhelmingly supported continued investment in the NEC, a better-connected and integrated rail network, and a plan with flexibility to respond to future travel needs. In light of these comments, the FRA focused the Preferred Alternative on maintaining and improving the NEC while optimizing added capacity to support the Grow Vision (see Tier 1 Final EIS, Volume 1, Chapter 4).

In identifying the Preferred Alternative, the FRA followed an iterative process. This approach allowed the FRA to consider the overall vision for the role of rail in a holistic manner. The FRA's decision-making process provided the flexibility necessary to evaluate various factors together and to better understand the interrelationships between markets, service, infrastructure, and environmental considerations. The FRA's decision-making framework incorporated the following key factors (Figure 2-1):

- **Tier 1 Draft EIS Findings.** As evaluated in the Tier 1 Draft EIS, what do the results of the technical analysis show about the alternatives? What is the ridership, trip time, frequency of service they support? What would be the environmental and economic impacts?
- **Stakeholder and Public Comments.** What did we hear from the public and stakeholders about NEC FUTURE throughout the process, particularly about the alternatives evaluated in the Tier 1 Draft EIS? What do the public, the states, and the railroad operators want for the NEC in the future and how can that be achieved?
- **Policy Objectives.** How well do the alternatives address goals of the U.S. DOT and the FRA?[4] For example, do they create opportunities for enhanced service and operating efficiencies for the operating railroads?

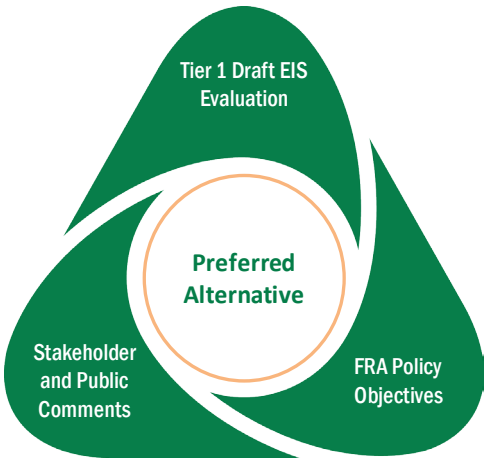


Figure 2-1: Framework for Decision-Making

2.3 ALTERNATIVES EVALUATION

In the Tier 1 Final EIS, the FRA evaluated the Preferred Alternative using the same metrics used to evaluate the No Action Alternative and Action Alternatives in the Tier 1 Draft EIS (see Tier 1 Final EIS, Volume 1, Chapter 9). The evaluation metrics demonstrated how the Preferred Alternative's improvements in mobility, service frequency, and travel times would meet the Purpose and Need and ultimately result in improvements in both Intercity and Regional rail travel throughout the NEC.

As presented in the Tier 1 Final EIS, all of the Action Alternatives addressed the state-of-good-repair needs of the existing NEC. Beyond that, the FRA's analysis showed that Alternative 1 fell short of the service required to grow the rail share of the travel market and could not meet passenger demand in critical markets, such as the New York metropolitan area. Relative to Alternatives 2 or 3, Alternative 1 was less effective in meeting projected growth in demand to 2040 and beyond. Alternative 3, while addressing the need to grow Regional rail services along the existing NEC, was more expansive in the scale of services, and offered significant travel time improvements between major urban centers. Alternative 3 also resulted in much greater environmental impacts; additionally, forecast ridership benefits were modest compared to Alternative 2 and did not outweigh the additional capital investment required to add a second end-to-end two-track spine. The Preferred Alternative ridership was higher than that of Alternative 2 and capital costs somewhat lower, while ridership was similar to Alternative 3.

[4] For more information on U.S. DOT and FRA policy objectives, see the Tier 1 Final EIS, Volume 1, Chapter 4.

The FRA highlighted the differences between the three Action Alternatives and the Preferred Alternative in the Tier 1 Final EIS. The Preferred Alternative incorporated the Grow Vision from Alternative 2, striking a balance between the capacity limitations of Alternative 1 and the investment suggested by Alternative 3. The Preferred Alternative further refined the Grow Vision by enhancing capacity south of New York City and prioritizing a commitment to improve the existing NEC.

The Preferred Alternative balanced the ongoing investment necessary to sustain and improve the existing NEC with improved service offering more choices to current and future travelers. The Preferred Alternative took advantage of enhanced service concepts (common-ticketing, integrated schedules, run-through services, timed transfers) to offer higher quality passenger rail service for all users. The Preferred Alternative provided the opportunity for advanced rail service to seamlessly integrate Intercity and Regional rail operations with a greatly improved Intercity-Corridor service to reach and connect local stations with Hub and terminal stations. The Preferred Alternative would transform the passenger experience by greatly enhancing convenience, reliability, travel time savings, and travel choices.

Markets served, types of services, and service objectives were a key focus for the FRA in defining the Preferred Alternative. The service objectives for passenger rail that defined the Preferred Alternative were most responsive to the NEC FUTURE Purpose and Need statement and to stakeholder and public input. Furthermore, the FRA focused on finding ways to increase the integration of the rail network, for the NEC and its connecting corridors, with the Preferred Alternative.

The Preferred Alternative included improved service to all NEC markets, one-seat-ride service to and between stations on the Hartford/Springfield Line and NEC markets, and additional service to selected new markets. In this regard, the Preferred Alternative represented a corridor-wide commitment to the NEC and the urban centers it connects today, including easier connections within the NEC and more coordinated connections for trains operating south to Richmond, VA, and Charlotte, NC, west to Harrisburg and Pittsburgh, PA, and north to Albany and Buffalo, NY, and to Hartford, CT, and Springfield, MA. The FRA defined representative service plans and infrastructure elements to test the feasibility of the Preferred Alternative and evaluate its benefits.

2.4 SUMMARY OF PUBLIC FEEDBACK FROM TIER 1 FINAL EIS

Upon issuance of the Tier 1 Final EIS (December 16, 2016), the FRA committed to a no less than 30-day waiting period before issuance of the ROD. In light of the volume of feedback received following the issuance of the Tier 1 Final EIS, the FRA announced on the NEC FUTURE program website that it would issue the ROD no earlier than March 1, 2017. Contemporaneous with its development of this ROD, the FRA reviewed and considered all feedback received through May 12, 2017. The FRA received feedback from more than 1,300 individuals, agencies, and organizations. In

selecting the Grow Vision and issuing this ROD, the FRA considered feedback on the Tier 1 Final EIS, in addition to previously received comments on the Tier 1 Draft EIS. Appendix A to this ROD (Feedback Submissions and Responses) provides a comprehensive summary of the feedback received on the Tier 1 Final EIS and Preferred Alternative along with the FRA's responses. The following is a high-level thematic summary of the feedback received:

- **Feedback on the Grow Vision for the NEC** – The FRA received many submissions expressing support for improving rail service and performance on the NEC and several submissions noted the importance of the NEC to economic growth in the region. However, the feedback diverged with regard to the priorities reflected in the Grow Vision. On the one hand, many submissions emphasized the importance of improving the existing NEC as a top priority. Stakeholder railroads and states expressed unanimous support for the near-term improvements necessary to bring the NEC to a state of good repair. Some submissions encouraged the FRA to adopt a more ambitious vision, including high-speed service and expansion to additional markets, potentially including a second spine.
- **Feedback on Analysis in the Tier 1 Final EIS** – The FRA received a range of feedback relating to the adequacy of the analysis in the Tier 1 Final EIS. Some submissions raised questions about the definition of alternatives or level of detail of the analysis provided in the Tier 1 Final EIS. The FRA also received feedback about the assumptions and methods for ridership forecasting as well as the completeness of or accuracy of environmental resource data, particularly with regard to identification of local environmentally sensitive areas.
- **Feedback on Public Involvement on the Tier 1 Final EIS** – The FRA received many submissions on issues regarding public involvement opportunities related to the Tier 1 Final EIS. Many submissions requested an extension to the 30-day waiting period prior to issuance of the ROD to allow for more public review and feedback. The FRA also received feedback on public notice and overall outreach efforts after issuance of the Tier 1 Final EIS and throughout the NEC FUTURE program. The FRA received some submissions regarding the FRA's process for identifying the Preferred Alternative in the Tier 1 Final EIS and the opportunity for public input before the FRA identified the Preferred Alternative.
- **Feedback on elements of the Preferred Alternative** – The FRA received feedback regarding specific infrastructure elements included in the Preferred Alternative, including new segments, new track, station improvements, and chokepoint relief projects, expressing either support or opposition to the potential location of specific infrastructure elements, the feasibility or need for the improvement, and relationship of other projects to the proposed improvements. Generally, submissions identified concerns with impacts to specific environmentally sensitive or culturally significant resources, as well as the potential effects to passenger service on the existing NEC. Submissions received also supported adopting a vision that provides the flexibility to both respond to near-term priorities and provide for long-term growth.

- **Feedback on the Old Saybrook to Kenyon New Segment Included in the Preferred Alternative** – The majority of feedback regarding the Preferred Alternative infrastructure elements expressed opposition to the Old Saybrook to Kenyon new segment, based on the expected impacts to shoreline communities, including impacts to historic resources, businesses, natural resources, and overall quality of life. Feedback strongly urged the FRA to exclude the Old Saybrook to Kenyon new segment altogether from the ROD and conduct further research and outreach before making any decision on the type or location of new capacity in this section of the corridor.
- **Feedback on Plans for Tier 2 Project Studies** – Many submissions addressed issues related to Tier 2 project studies. Submissions requested ongoing public involvement in the Tier 2 project studies that follow the Tier 1 ROD; some suggested specific ways in which stakeholders should be included in the subsequent Tier 2 planning processes. Some submissions discussed the range of alternatives to be considered in Tier 2 project studies and sought specific commitments from the FRA in the Tier 1 ROD. Submissions from federal and state agencies encouraged continued agency coordination through the Tier 2 project studies. Several submissions recommended that the FRA take steps to streamline environmental reviews for Tier 2 projects. Finally, several submissions addressed the development of the SDP for the NEC following completion of the Tier 1 ROD.

The feedback helped to highlight the importance of selecting an investment plan that would improve passenger rail service on the existing NEC, achieve a reliable NEC, expand rail capacity, and appropriately take into account the impacts of NEC expansion on those living or working along the rail line. While the feedback suggests that there is support for moving forward with implementing the Grow Vision, it also helped clarify that finding a solution to address the capacity, performance, and resiliency needs of the NEC between New Haven, CT, and Providence, RI, will require further study before the Tier 2 NEPA process can begin in that portion of the corridor.

2.5 IDENTIFICATION OF THE SELECTED ALTERNATIVE

The Selected Alternative (described in Section 3) is a refinement of the Preferred Alternative identified in the Tier 1 Final EIS. In identifying the Selected Alternative, the FRA considered the same factors used to identify the Preferred Alternative: the technical analyses in the Tier 1 Draft EIS, U.S. DOT and FRA policy objectives, and comments received from the public and stakeholders. In addition, the FRA considered the technical analyses in the Tier 1 Final EIS and feedback received following issuance of the Tier 1 Final EIS (see Section 2.4 and Appendix A).

The conclusions the FRA reached in support of the Preferred Alternative largely remain the same. Specifically, the Preferred Alternative's service objectives, commitment to achieving a state of good repair on the existing NEC, and recommended infrastructure elements between Washington, D.C., and New Haven, CT, and between Providence RI, and Boston, MA, best meet the NEC FUTURE

Purpose and Need. Furthermore, the Preferred Alternative responded to comments calling for the preservation and improvement of the existing NEC, including more frequent and reliable service on the existing network. Additionally, in comparison with the other alternatives considered, the Preferred Alternative best addressed the following U.S. DOT and FRA policy objectives:

- Meeting market demand and expanding services to new markets
- Providing flexibility to respond to future changes in the Northeast region
- Advancing new approaches to delivering NEC services
- Increasing resiliency and redundancy
- Reducing the negative impacts of transportation
- Providing positive economic opportunities for the NEC region

Accordingly, the FRA has identified a Selected Alternative that includes the Preferred Alternative's service and performance objectives, its commitment to achieving a state of good repair on the entire NEC, and its infrastructure elements between Washington, D.C., and New Haven, CT, and between Providence, RI, and Boston, MA.

Following the release of the Tier 1 Final EIS, the FRA determined that the technical analysis in the Tier 1 Draft and Final EIS, the comments received during the Tier 1 Draft EIS comment period, and the feedback received following the issuance of the Tier 1 Final EIS warranted refinement of the Preferred Alternative in portions of Connecticut and Rhode Island. Based on the Tier 1 Draft and Final EIS analysis, and consistent with the NEC FUTURE Purpose and Need, between New Haven, CT, and Providence, RI, the FRA found a fundamental need to expand capacity, improve performance, and increase resiliency, including some sections using new rights-of-way. Due to physical constraints in the geography of the area, expanding largely within or along the existing NEC right-of-way is not possible and does not meet the NEC FUTURE Purpose and Need. However, the Tier 1 Draft EIS analysis also indicated that the costs and environmental effects associated with off-corridor routing from Hartford, CT, to Providence, RI, included in Alternative 2 (from the Tier 1 Draft EIS) remained a concern. Comments received during the Tier 1 Draft EIS comment period and feedback received following issuance of the Tier 1 Final EIS indicated that there is broad public concern regarding the impacts associated with the Old Saybrook to Kenyon new segment included in the Preferred Alternative. At this time, there is no consensus regarding the appropriate railroad infrastructure elements in this area. Therefore, unlike the Preferred Alternative, the Selected Alternative does not include capacity-expanding infrastructure elements between New Haven, CT, and Providence, RI. In this location, the Selected Alternative includes a capacity planning study to identify infrastructure elements between New Haven, CT, and Providence, RI, to achieve the Grow Vision.

3. NEC FUTURE Decision

3.1 OVERVIEW OF SELECTED ALTERNATIVE

The NEC FUTURE Tier 1 ROD completes the first step in a tiered environmental review process. In this ROD, the FRA identifies the Selected Alternative, which adopts a Grow Vision for the NEC. The Selected Alternative is a corridor-wide vision for the NEC to achieve modern, efficient passenger rail service for travelers on the NEC, and consists of 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, CT, and between Providence, RI, and Boston, MA, 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.

The Selected Alternative establishes corridor-wide service and performance objectives to guide investment decisions so that they support increased train service that is substantially faster and more reliable. Achieving those corridor-wide service and performance objectives will require collaboration with the NEC states and nine railroad[5] operators.

The Selected Alternative approves infrastructure elements as presented in the Preferred Alternative to achieve a corridor-wide Grow Vision only between Washington, D.C., and New Haven, CT, and between Providence, RI, and Boston, MA. Subsequent Tier 2 project planning will determine the specifics of each infrastructure element (i.e., location, construction type).[6]

For the NEC between New Haven, CT, and Providence, RI, the Selected Alternative does not include infrastructure elements. Instead, the Selected Alternative requires a capacity planning study, in partnership with Connecticut and Rhode Island, to identify the on- and off-corridor infrastructure

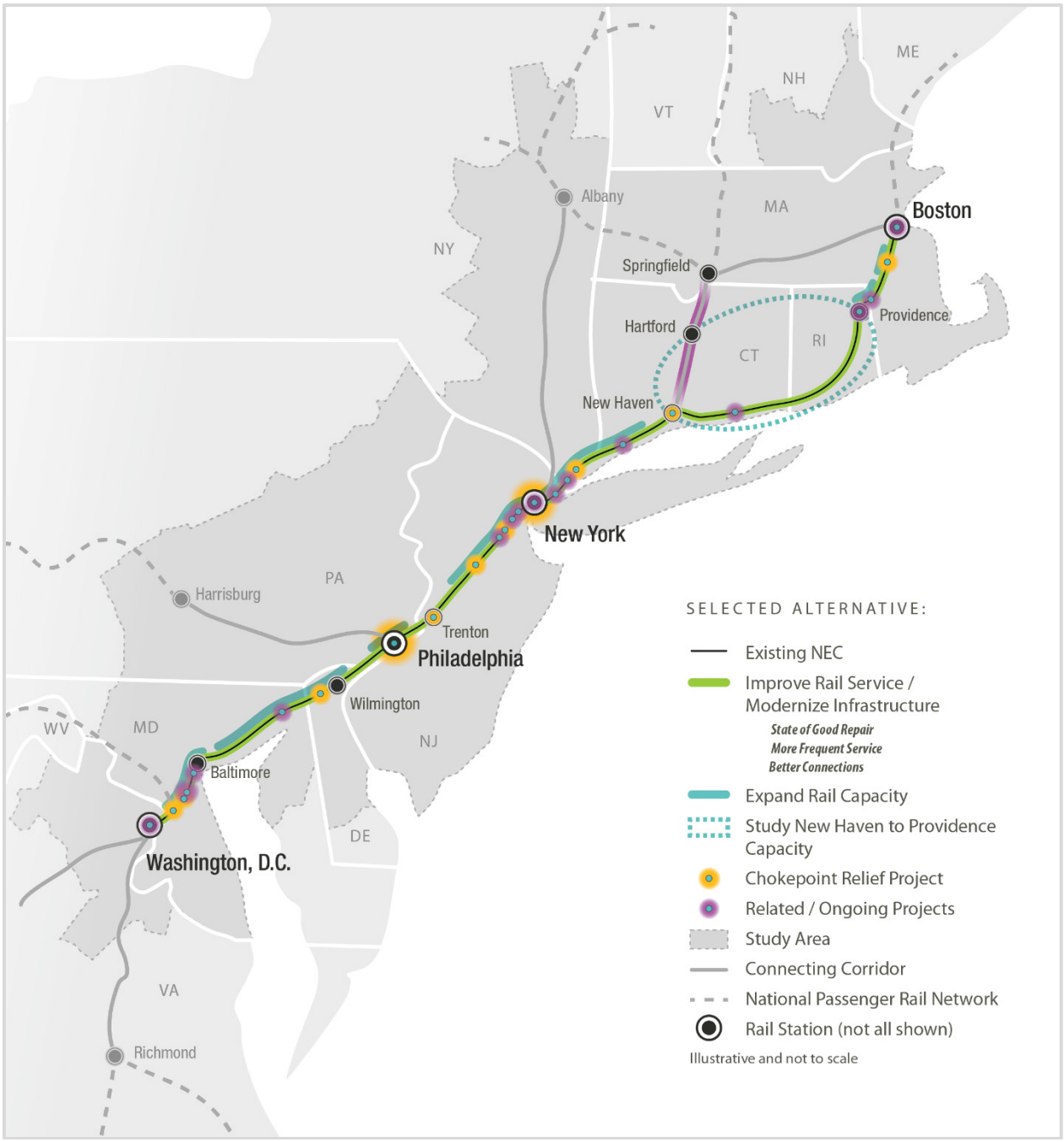
[5] Nine railroad operators include Intercity service provided by Amtrak and Regional rail operated by Virginia Railway Express, Maryland Area Regional Commuter, Southeastern Pennsylvania Transportation Authority, NJ TRANSIT, MTA-Long Island Rail, MTA-Metro-North Railroad, Connecticut Shore Line East, and Massachusetts Bay Transportation Authority.

[6] Tier 2 or Tier 2 project studies refer to actions subject to NEPA tiering from this Tier 1 Record of Decision.

elements necessary to achieve the Selected Alternative's service and performance objectives. This capacity planning study—referred to as the New Haven to Providence Capacity Planning Study—will consider inland as well as shoreline routes (both on or off the existing NEC) and include the Hartford/Springfield Line, for providing passenger rail service between New Haven, CT, and Providence, RI, consistent with the Selected Alternative. The identification of specific infrastructure elements between New Haven, CT, and Providence, RI, will be subject to the completion of the New Haven to Providence Capacity Planning Study. Implementation of infrastructure identified through the New Haven to Providence Capacity Planning Study will require further environmental compliance and planning activities, as appropriate.

Figure 3-1 shows the location of the four components of the Selected Alternative.

Figure 3-1: Selected Alternative



3.2 IMPROVE RAIL SERVICE: Corridor-Wide Objectives

The Selected Alternative will improve NEC rail service by establishing corridor-wide objectives for service and performance, and integrated operations for both Intercity and Regional rail services. Meeting the corridor-wide objectives will achieve the Grow Vision and fulfill the Purpose and Need of NEC FUTURE.

The Selected Alternative's service and performance objectives are intended to guide federal investment decisions, but FRA understands that achieving these targets will take time and will be met through phases of investment over decades. Not every infrastructure project will meet the service and performance objectives independently, as investments will be influenced by operational, financial, and other resource constraints. Coordinated planning to align all investments toward reaching the Selected Alternative's objectives will allow incremental investments to achieve ultimately improved corridor-wide rail service. The FRA will use these targets to review future Tier 2 projects' consistency with the Selected Alternative when FRA funding or approval is required for the project. The FRA recommends that future project sponsors acknowledge and consider the Selected Alternative's service and performance objectives in project development. As part of this consideration, sponsors should identify how the particular project contributes to the Selected Alternative's objectives within the constraints of the immediate project proposal, given the operational, technical, financial, or other constraints the sponsor faces at that time.

The Selected Alternative also recommends enhanced service concepts to achieve integrated operations on the NEC. These enhanced service concepts are necessary to meet the service and performance objectives and are recommended to improve passenger rail service, but are not intended to be prescriptive. The FRA understands that implementing the recommended service concepts will require coordination and collaboration between railroads and other stakeholders on the NEC and may require changes to existing operating practices and service or access agreements between operating railroads.

3.2.1 Service and Performance

For service and performance objectives, the FRA adopts the frequency, travel time, and design speed objectives of the Preferred Alternative as part of the Selected Alternative. Achieving the service and performance objectives will require infrastructure investments as well as the adoption of enhanced service concepts, as appropriate.

The Selected Alternative establishes corridor-wide travel time and design speed targets for Intercity services. The Selected Alternative also identifies corridor-wide and geographic segment-specific frequency targets to accommodate both Intercity and Regional rail service needs. Appendix B, Definition of Decision Matrix and Schematic, describes the service and performance targets in more detail. The following sections discuss frequency, travel time, and design speed targets to achieve the corridor-wide service and performance objectives.

Frequency Targets

The Selected Alternative's corridor-wide frequencies—estimated for a range of Intercity service types and evaluated for the Grow Vision—will meet market demand and respond to future traveler needs. Corridor-wide frequency targets for Intercity service are broadly defined as follows:

- 10 trains per peak hour/peak direction from Washington, D.C., to New Haven, CT
- 6 to 8 trains per peak hour/peak direction from New Haven, CT, to Providence, RI, and from Providence, RI, to Boston, MA[7]

Geographic segment-specific frequency targets apply to both Intercity and Regional rail services. Appendix B, Definition of Decision Matrix and Schematic, describes the geographic segment-specific frequencies. Examples of the geographic segment frequency targets include the following:

- At least 52 trains per peak hour/peak direction between New Jersey and New York (trans-Hudson)

Travel Time Targets

Travel time targets are estimated for Intercity-Express services, with limited stopping patterns, to address both market demands and travel time improvements. The FRA will use these travel time targets to review Tier 2 projects' consistency with the Selected Alternative when FRA funding or approval is required for the project. With refined service plans, improved infrastructure, and integrated operations, it may be possible to exceed these targets to the benefit of corridor-wide travelers. Corridor-wide travel time targets, expressed as hours and minutes (H:MM), are as follows:

- Washington, D.C., to Boston, MA = 5:00 (with 4 intermediate stops)
- Washington, D.C., to New York City, NY = 2:10 (with 3 intermediate stops)
- Washington, D.C., to Philadelphia, PA = 1:15 (non-stop)
- Washington, D.C., to Philadelphia, PA = 1:25 (with 3 intermediate stops)
- New York City to New Haven, CT = 1:05 (with 1 intermediate stop)
- New York City to Boston, MA = 2:45 (with 5 intermediate stops)

Design Speed Targets

The Selected Alternative identifies those geographic locations where additional capacity is required and recommends the addition of new track within the NEC or additional track capacity constructed

[7] Identification of routes for trains between New Haven, CT, and Providence, RI, will be evaluated in the New Haven to Providence Capacity Planning Study.

outside the NEC right-of-way (new segment). The integrated operations objective (described in the following section) depends upon standardized performance across the NEC. To that end, the general track operating design speed for the existing NEC is 160 mph, except where physical constraints or other operating constraints limit speed. New segments should be designed for 220 mph operations, unless there are unique or exceptional constraints that justify limiting the highest practical speed. The operating speed on any of the NEC (new track or new segments) will vary depending on physical constraints, stopping patterns, and equipment, but the design speed should allow for a high optimum speed that could be achievable over time. When FRA funding or approval is required for the project, the FRA will review Tier 2 projects that involve new track or new segments for consistency with the design speed targets necessary to achieve the Grow Vision.

3.2.2 Integrated Operations

The Selected Alternative focuses on the NEC, but also expands the reach of the NEC by improving connections in urban areas and at airports near the NEC and integrates the NEC with services on connecting corridors. Establishing and using enhanced service concepts is necessary to create an integrated rail network. The FRA is including these concepts in the Selected Alternative to guide the rail operators toward more opportunities to integrate services and efficiently use existing and planned infrastructure.

The enhanced service concepts have the potential to make passenger rail more attractive and user-friendly for customers, may reduce the capital cost of projects, and may allow rail operators to reduce the future cost of operations. In general, these concepts can apply to Intercity or Regional rail services, as described below:

- Regular clockface headways schedule train arrivals and departures at regular, repeating intervals every hour throughout the day (e.g., half-hourly on the 0:15/0:45). The repetition of a daily pattern often allows passengers to memorize the train schedules they care about, making the service easier to use.
- Simplified operations encourage fewer types of trains that use common or standardized stopping patterns. The resulting service is easier for passengers to understand and can be particularly useful in congested areas where infrastructure capacity is scarce.
- Improved Intercity-Corridor train service using high-performance train equipment is capable of serving additional Regional rail stations with schedules the same as or faster than today's service. This improved Intercity-Corridor train service is represented by Metropolitan service in the NEC FUTURE Tier 1 Final EIS and expands frequencies and access within and between markets along the NEC as well as conveniently links Intercity and Regional rail services. The Metropolitan-type service also introduces frequent headways (15 minutes) and unreserved seating that allows passengers to arrive at the station and catch the next train without having to pre-book.

- Run-through services at both Washington Union Station and Penn Station New York will enable one-seat ride Regional rail services across these major metropolitan areas. These services will expand the range of possible trips available to passengers and eliminate transfers, such as NJ TRANSIT and Metropolitan Transportation Authority (MTA)-Metro-North/Long Island Rail Road run-through service at New York City. Run-through service can reduce dwell times and congestion at platforms and create efficiencies in the number of trains moving through congested infrastructure.
- Pulse-hub operations coordinate schedules so multiple Intercity and Regional rail services stop at a station at a defined "pulse" time, wait a few minutes for passengers to transfer between all services and directions, then depart. For example, the Selected Alternative includes pulse-hub operations at Philadelphia 30th Street Station and New Haven Union Station. A complementary approach to coordinating schedules is to coordinate endpoint and branch line connections, enabling easy and fast transfers for passengers between different operators and a wider choice of destinations.
- A common means for payment of fares available to customers of all NEC railroads, and a consolidated NEC-wide schedule, will enhance and simplify the passenger experience.
- Coordinated ticketing, reservation systems, and fares to support through- and common-ticketing will improve passenger convenience and connectivity and achieve operating efficiencies for both Intercity and Regional rail services. A FAST Act study to be conducted by the NEC Commission will analyze the feasibility of and options for through-ticketing between Amtrak and commuter rail services on the NEC.[8]
- Other passenger experience and convenience enhancements—including consideration of bike-rail interface policies for when/how bicycles can be carried onboard and alternative safe storage accommodations—are encouraged.

The Selected Alternative recommends that passenger railroad operators perform the following:

- Coordinate storage and maintenance needs to achieve investment and operating efficiencies.
- Use shared-use facilities wherever possible.

The Selected Alternative encourages adoption of these operational changes and passenger experience enhancements. In reviewing the consistency of proposed improvements with the Selected Alternative, the FRA will consider whether the improvement supports implementation of enhanced service concepts as well as efficient operations as a means of reducing capital and operating support requirements.

[8] The FAST Act is the Fixing America's Surface Transportation (FAST) Act, December 2015, which authorizes funding for transportation through 2020. Reference to the through-ticketing study is in Section 11312.

The FRA recognizes the complex, multi-operator environment of the NEC and that each operator has a different customer base, different service objectives as well as off-corridor operations that influence their individual service planning. The Selected Alternative's additional capacity and operating flexibility, including the enhanced service concepts, will allow railroad operators to achieve increased service levels and offer more-convenient service. The FRA will facilitate continued planning with Intercity and Regional railroads, in cooperation with the NEC Commission, to support the development of integrated service plans that can achieve the more robust service and performance envisioned for the NEC.

3.3 MODERNIZE NEC INFRASTRUCTURE: Achieve a Reliable NEC

The Selected Alternative includes the modernization of the existing NEC to bring it to a state of good repair. Accordingly, improvements that are consistent with the Selected Alternative include projects that repair, replace, rehabilitate, and/or modernize infrastructure on the existing NEC.[9] The Selected Alternative will adapt or harden existing infrastructure that is vulnerable to inundation and extreme weather or other unforeseen events.

Modernization includes repair, replacement, or rehabilitation of electric catenary, power supply, and signal systems, and replacement/rehabilitation of major bridges and tunnels, under-grade bridges, track and interlocking components, station and platform infrastructure, and infrastructure that supports safe railroad operations. These improvements—whose primary function is to modernize the NEC—will be planned to be integrated with and supportive of other capacity-expanding projects necessary to increase service frequencies and meet the performance objectives of the Selected Alternative. For example, the FRA expects the design for replacement of an existing two-track under-grade bridge will support, or at least not preclude, construction of a four-track replacement, where four tracks will be required in the future to support service frequency objectives in the Selected Alternative.

The FRA's commitment to modernize the NEC applies corridor-wide from Washington, D.C., to Boston, MA. The FRA will coordinate with participating railroads, the NEC Commission, as well as the FTA, on modernization plans and projects to determine consistency with future required investments to grow the capacity of the NEC. Between New Haven, CT, and Providence, RI, where infrastructure elements are not yet identified, the FRA approves modernizing the NEC to a state of good repair within existing capacity constraints.

[9] "Repair" may also include demolition and removal of aging, unnecessary, or outdated infrastructure.

3.3.1 No Action Alternative and Related Projects

As part of NEC FUTURE, the FRA identified ongoing projects that currently advance efforts to repair, rehabilitate, replace or otherwise modernize infrastructure on the NEC. These projects were included either as part of the No Action Alternative or as Related Projects.

The No Action Alternative identified three types of projects on the NEC: those that are programmed or funded, those that are federally mandated, and those that are necessary to keep the railroad operating. These No Action Alternative projects provide the foundation for the Selected Alternative and are necessary to achieve the Grow Vision (Table 3-1). These No Action Alternative projects have independent utility and therefore can advance separately from and concurrently with the infrastructure elements included in the Selected Alternative. The FRA will continue to coordinate with project sponsors on No Action Alternative projects regarding consistency with the Selected Alternative.

The Selected Alternative includes some infrastructure elements identified as Related Projects (Table 3-2). These Related Projects are some of the major backlog projects along the NEC that are currently underway, but not included in the No Action Alternative because of their funding status (Section 2.2.1). These Related Projects (e.g., Baltimore & Potomac [B&P] Tunnel, Susquehanna River Bridge, Hudson Tunnel, and Boston South Station Expansion) are undergoing their own separate but concurrent NEPA processes. The FRA supports these projects, which have independent utility, and are advancing concurrently with the Selected Alternative. The FRA is coordinating closely with Related Project sponsors regarding consistency with the service and performance objectives defined for the Selected Alternative.

A second group of Related Projects are located off the NEC but are important to the overall integrated rail network (Table 3-3). This second group of Related Projects (e.g., Southeast High-Speed Rail [SEHSR] Corridor, Metro-North Railroad Hudson Line High-Capacity Signal System Replacement [Harmon to Poughkeepsie]) includes improvements to connecting corridors. Unlike the Related Projects on the NEC and included in the Selected Alternative, these Related Projects are not included in the Selected Alternative; however, the FRA will continue to coordinate with project sponsors to ensure consistency with the Selected Alternative.

3.4 EXPAND RAIL CAPACITY: Add New Infrastructure Elements

Achieving the Selected Alternative's service frequency and travel time performance objectives will require significant investment in new and upgraded railroad infrastructure to relieve chokepoints and add capacity to support reliable train and station operations. Also necessary is the application of best practices and state-of-the-practice technology to support safe and reliable operations, particularly in shared operating environments (Intercity, Regional, and freight rail), and to achieve corridor-wide performance objectives. A key goal will be to construct new rail infrastructure that is not only resilient to flooding, but also located in areas less vulnerable to sea level rise, storm surge,

or riverine flooding. In growing rail capacity, redundant infrastructure provides alternative routings to minimize the ripple effects of delays or service disruptions.

The Selected Alternative includes the infrastructure elements necessary to achieve the service and performance objectives (Section 3.2) as represented in the Preferred Alternative for the portions of the NEC between Washington, D.C., and New Haven, CT, and between Providence, RI, and Boston, MA. This includes more than 200 route miles of additional track capacity, creating a four- to six-track NEC, and the replacement and expansion of the bridges and tunnels as required to support the service frequency and travel time objectives. Section 3.7 summarizes the infrastructure elements approved for the Selected Alternative by type of improvement and by geographic location. These include elements such as chokepoint relief projects, new track and track upgrades, station expansions, bridge replacements, curve modifications, and new segments (see Appendix B, Definition of Decision Matrix and Schematic). The types of infrastructure elements identified for the Selected Alternative are defined as follows:

- **Chokepoint** relief projects address constraints near stations, at railroad junctions, and at yard locations.
- **New Track** projects are additional track and/or associated systems improvements along the existing NEC, defined as the addition of one or two tracks to the existing NEC, or an upgrade to the catenary or signal systems.
- **Curve Modification** projects straighten or lengthen curves currently limiting operating speed and capacity on the NEC.
- **Bridge Replacement** projects replace aging and/or movable bridges.
- **New Segments** are sections of new track that may be constructed outside the existing NEC right-of-way. New segments diverge from and reconnect to the existing NEC providing additional track capacity to relieve chokepoints.
- **Station Improvements** include new stations, or modifications or expansions to existing stations, along the NEC to accommodate increased service needs and enhanced service concepts.
- **Systems Upgrade** projects upgrade catenary, electrification, or signals systems on the existing NEC.

In some cases, the complexity of the project or its interdependence with other Related Projects may require a planning or feasibility study prior to entering into Tier 2 project planning. Decisions about whether or not a planning study prior to commencement of a Tier 2 NEPA study is advisable will made by the appropriate federal funding agency, railroad stakeholders, and project sponsors.

Table 3-1: No Action Alternative Projects included in the Selected Alternative

State	Name	Project Description
MD	Fleet Acquisition/Overhaul	New MARC coaches
DE	Third Track Expansion, Ragan to Brandy and Mill Creek Bridge Rehabilitation	1.5 miles of a high-speed third track on the NEC near Wilmington, DE, including Mill Creek Bridge rehabilitation and replacement
	Newark Delaware Regional Transportation Center Phase 1	New train station and transit center in conjunction with transit-oriented development
PA	Levittown Intermodal Facility Improvements	Improvements to Levittown Station on the Trenton Regional Rail Line
	Fleet Acquisition/Overhaul	Regional Rail Silverliner IV Replacement, Regional Rail Bi-Level Car & Locomotive acquisition and overhaul
NJ	Elizabeth Intermodal Station Reconstruction	The reconstruction of the passenger platforms and station building at Elizabeth Rail Station
	County Yard and Delco Lead Safe Haven Storage and Re-Inspection Facility Project	Reconfiguration and expansion of the existing County Yard
	Mid-Line Loop	Eliminate the at-grade crossing conflict on the NEC at the Jersey Ave Station/County Yard facility and construct a new station at North Brunswick, NJ
	NJ TRANSIT Grid	Natural gas/solar power generation and distribution system for NJ TRANSIT and Amtrak
	NJ High-Speed Rail Improvement Project (NJ-HSRIP) Amtrak's High-Speed Intercity Passenger Rail Program, also known as "Raceway"	Upgrade or replace catenary, power, track, and signal systems between New Brunswick, NJ, and Trenton, NJ
	NEC Newark Intermodal	Includes structural rehabilitation, pedestrian and traffic circulation improvements, and any related track and rail infrastructure work
	Fleet Acquisition	Rail rolling stock acquisition
NJ/NY	New York Penn Station Improvements	Amtrak, NJ TRANSIT, Metropolitan Transportation Authority (MTA)/Long Island Rail Road (LIRR) ongoing station upgrades
NY	River to River Resiliency for LIRR and Amtrak	Flood protections at multiple tunnel portals used by the LIRR and Amtrak
	LIRR Fire & Life Safety – ERT and Penn Station New York (PSNY) Complex	Replace and/or restore systems within the East River tunnels
	LIRR – PSNY Improvements	Investments in the LIRR area of the Penn Station Complex as part of the Penn Station Visioning effort
	Penn Station Access Improvements	Improvements to link Metro-North Railroad commuter railroad directly to Penn Station and construction of four new stations in the Bronx
	Penn-Moynihan Station Complex Train-shed Hardening Project	Flood protections within the Penn-Moynihan Station Complex

Table 3-1: No Action Alternative Projects included in the Selected Alternative (continued)

State	Name	Project Description
NY	Harold Interlocking NEC Congestion Relief Project	Conflict-free, grade-separated route through the Harold Interlocking railroad junction in Queens, New York
	Moynihan Station Phase 1	Moynihan Station project providing increased access to the western portions of the Penn Station platforms
	NHL NY – Ongoing normalized replacement programs (New Rochelle to NY/CT State Line)	Communications & signals, bridge, track, catenary power, stations, and safety/administration programs
	Fleet Acquisition	LIRR acquisition of M-9 electric cars
	East Side Access	New tunnels, rail system elements and a new station on Manhattan's east side for LIRR
	NHL NY – PTC Installation (New Rochelle to the NY/CT State Line)	Install positive train control safety system to meet 2008 federal rail safety law
	New York Penn Station - Service Plant Upgrade and Tunnel Emergency	Ongoing North and East River tunnel life safety improvements
CT/NY	Fleet Acquisition	Acquire M8 cars to replace existing electric multiple units west of New Haven and existing diesel trains on Shore Line East
CT	Shore Line East Stations – High-Level Platforms/Pedestrian Overpasses	Improve high-level platforms and pedestrian overpass
	Stamford Intermodal Access	Pedestrian, platform, and outdoor access and safety improvements at the Stamford Transit Center
	Shore Line East New London Track 6 Catenary Improvements	Catenary and related improvements on Track 6 at New London Station
	Shore Line East Power Supply Upgrade	Improvements to NEC power supply system to support electric train service on Shore Line East
	New Haven Line Under-grade Bridges	Replace the existing under-grade bridges of the New Haven Line
	Connecticut Department of Transportation (CDOT)/New Haven Line – Catenary Replacement–Segment C1A and C2	Replace the original catenary East Norwalk to Green's Farms and Bridgeport to Milford
	Norwalk River Bridge Replacement	Replacement of the existing bridge
	New Haven Yard Master Complex – Phase 1	Expand and improve New Haven Line rail facilities to support CDOT's expanded fleet
	NHL Signal System Replacement Phases 1–3	Re-signal the CT portion of the New Haven Line with higher capacity five- aspect cab/no wayside signal system
	Shore Line East Guilford & Old Saybrook Sidings	Track and catenary improvements at Old Saybrook and Guilford stations
	NHL CT – Ongoing normal replacement programs (NY/CT State Line to New Haven)	Track, bridge, interlocking, drainage, bridge design, and communications & signals programs; and New Haven Line stations
	NHL CT – PTC (NY/CT State Line to New Haven)	Install positive train control safety system to meet 2008 federal rail safety law
RI	Kingston Station Track and Capacity Improvements	Third track at Kingston Station, high-speed interlocking, high-level platforms, connections to local transit
MA	Ruggles Street Station	Modernization of the Ruggles Station
	Fleet Acquisition/Overhaul	Acquisition/overhaul of locomotives and coaches

Table 3-1: No Action Alternative Projects included in the Selected Alternative (continued)

State	Name	Project Description
Multi	Amtrak – Fleet Acquisition	New equipment including the ACS-64 locomotives and Tier III Next Generation Trainsets for the Acela Express
	Americans with Disabilities Act (ADA) Station Improvements	Improve stations to meet ADA and state-of-good-repair requirements
	Amtrak NEC - Positive Stop Train Control (Washington to New Rochelle; New Haven to Boston)	Install positive train control safety system to meet 2008 federal rail safety law

Table 3-2: Related Projects on the NEC (included in the Selected Alternative)

State	Name	Project Description
D.C.	Washington Union Station Expansion Project	The Union Station Expansion Project will expand and improve the station with rebuilt tracks, platforms and other features
MD	Baltimore-Washington International (BWI) Thurgood Marshall Airport Station - New Station Building and Fourth Track	New station building to meet ADA/SGR requirements and analysis of adding a track to approximately nine miles of existing tracks surrounding the BWI station
	B&P Tunnel Rehabilitation/Replacement	Replacement and/or rehabilitation of the Baltimore & Potomac Tunnel in Baltimore, MD
	Susquehanna Bridge Rehabilitation/Replacement	Replacement and/or rehabilitation of the Susquehanna River Bridge in Maryland
NJ	Hunter Flyover	Grade-separated crossing of the Raritan Valley Line trains
NJ/NY	Portal Bridge	Replacement of the existing swing-bridge over the Hackensack River with a fixed-span bridge, and construction of a new bridge to increase NEC capacity
	Hudson Tunnel Project	Construction of two new tracks in a new tunnel under the Hudson River that connects the existing NEC in New Jersey to Penn Station New York, and rehabilitation of the existing NEC tunnel beneath the Hudson River
	Pelham Bay Bridge Replacement	Replacement of existing, movable bridge with a new bridge for Amtrak and proposed Metro-North Railroad service
NY	Moynihan Phase 2	The Farley Post Office will be converted into a full-scale, Intercity passenger rail terminal
	Sunnyside Yard Facility Upgrade	Upgrade Sunnyside Yard to improve the efficiency for NJ TRANSIT and Amtrak, and to accommodate longer Acela trains
	Penn Station Access Improvements	New infrastructure and completion of specifications for Metro-North Railroad service on the New Haven Line into PSNY via Amtrak's Hell Gate Line
CT	New Haven Line Bridge Replacement Projects	Replacement of New Haven Line Bridges (Devon, Cos Cob, and Saugatuck)
	Connecticut River Bridge *	Replacement of the existing two-track bridge with a new movable two-track bridge along a new alignment south of the existing bridge
RI	Providence Station Improvement Project PE/NEPA	Engineering and environmental analysis for improved passenger accessibility at the station
	Pawtucket/Central Falls Commuter Rail Station	Consideration of alternatives for a station on the NEC and the Massachusetts Bay Transportation Authority's Providence commuter rail line
MA	Boston South Station Expansion Project	Expansion of station and storage capacity in Boston, MA, for Intercity rail operations in a facility shared with commuter rail

* Connecticut River Bridge was not included as a Related Project in the Tier 1 EIS; however, it is included on this list since it is an ongoing project and is an infrastructure element included in the Selected Alternative.

Table 3-3: Related Projects on Connecting Corridors (not included in the Selected Alternative)

State	Name	Project Description
DC/VA	Long Bridge Project	Engineering and environmental analysis for the replacement and/or rehabilitation of Long Bridge
VA	Southeast High-Speed Rail (SEHSR) Corridor	Engineering and environmental analysis for the Southeast High-Speed Rail Corridor including the section between Washington, D.C. and Richmond, VA (DC2RVA)
	Positive Train Control - Washington to Richmond	Install positive train control to meet federal mandate
	Arkendale to Powell's Creek Third Track	Final design and construction of 11.4 miles of third track from Arkendale to Powell's Creek on the SEHSR
	CSX RF&P Rail Corridor Rail Corridor Third Track - Phase 2	Track, signal and switch work and second platforms at Leeland Road and Brooke Stations at the new Virginia Railway Express (VRE) Potomac Shores Station
	VRE – Stations and Facilities	Addition of second platforms, canopy and platform extensions, replacement of signage and other related improvements at various VRE stations
	VRE – Tracks & Storage Yards	Improvements to the VRE yards and maintenance facilities
	VRE – Track Lease Improvements	Access fees in the form of long-term and related capital improvements where VRE operates on railroad systems owned by Amtrak, CSX, and Norfolk Southern
	VRE – Potomac Shores Station	Design and construction of a new station to at Potomac Shores, VA
PA	Keystone Corridor - Grade Crossing Elimination	Final design and construction for the elimination of four public, at-grade crossings on the Philadelphia-Harrisburg Keystone Corridor
	Keystone Corridor- Interlocking Design	Engineering and environmental analysis for the replacement and reconfiguration of tracks and improvements to signal and train control along the Philadelphia-Harrisburg Keystone Corridor
	Keystone Corridor - State Interlocking Improvements	The final design and construction of an upgraded "State" interlocking near Harrisburg, PA
	Keystone Corridor - Automatic Block Signaling/Central Control	Engineering and environmental work for the installation of Automatic Block Signaling and Centralized Traffic Control on the Philadelphia-Harrisburg Keystone Corridor
	Paoli Transportation Center	New multi-modal transportation center in Paoli, Chester County, located on the Paoli/Thorndale Line serving Southeastern Pennsylvania Transportation Authority and Amtrak trains
	Ardmore Transportation Center	Ardmore station improvement project including demolition of the existing Amtrak station building
	Exton Station	ADA and access improvements at the Exton Station on the Paoli-Thorndale Regional Rail Line
	Villanova Intermodal Station	Modernization of Villanova station on the Paoli-Thorndale Regional Rail Line
	Middletown Station	Construction of new Amtrak station at Middletown to replace the existing station
	Mt. Joy Station	Construction of a new Mount Joy train station located in Mount Joy, PA to replace the existing station

Table 3-3: Related Projects on Connecting Corridors (not included in the Selected Alternative) (continued)

State	Name	Project Description
PA	Coatesville Train Station Rehabilitation	Rehabilitate existing Amtrak train station
	Levittown Intermodal Facility Improvements	Construction of intersection improvements at Levittown Parkway and Rt. 13 and relocation of utilities
NJ	NJ TRANSIT- Multiple Resiliency Projects in Response to Hurricane Sandy	Hoboken Long Slip Flood Protection; NJ TRANSIT Raritan River Drawbridge Replacement; and Train Controls - Wayside Signals, Power & Communication Resiliency
	Lackawanna Cutoff Minimal Operating Segment Project	Reconstruct line including track and signal improvements to approximately 88 miles of right-of-way, new stations, a train storage yard, and additional rail rolling stock
	Port Authority Trans-Hudson (PATH) Extension to Newark Liberty International Airport Rail Link Station	Proposed extension of PATH from its present terminus at Newark Penn Station to Newark Liberty International Airport's Rail Link Station (RLS)
NJ/ NY	Cross Harbor Freight Program Tier 1 EIS	NEPA Analysis to evaluate alternatives to improve the movement of freight across New York harbor between the east-of-Hudson and west-of-Hudson regions
NY	Empire Corridor Planning	Engineering and environmental analysis to support improved passenger rail on the Empire Corridor
	Hudson Subdivision Signal Reliability Improvements (All Phases)	This project will increase signal system reliability by replacing signals and burying the signal cable between Poughkeepsie and Red Hook
	Highway/Rail Grade Crossing Improvements (ESC3)	Upgrade and/or install warning devices at 13 highway-rail at-grade crossings on the Empire Corridor
	Albany to Schenectady 2nd Main Track (ESC10)	Construct a second main track between Schenectady and the west end of the Livingston Ave Bridge in Albany, upgrading existing grade crossings and warning device systems
	Schenectady Station 2nd Track & Platform Improvements (NY-ESC- HP - Empire Corridor Capacity Improvement - Section 3)	Replace the existing Schenectady station with a new station, station tracks and platform
	Empire Corridor - Ongoing Normal Replacement	The normal replacement rate is the annual funding needed to keep existing assets maintained and replaced within their useful life
	Livingston Avenue Bridge (ESC15)	Preliminary engineering for the eventual replacement of Livingston Avenue bridge, crossing the Hudson River between Rensselaer and Albany
	Metro-North Railroad Power and Signals Resiliency	The New York Metropolitan Transportation Authority (MTA) flood protections for the Metro-North Railroad Hudson River Line and other facilities
	Metro-North Railroad Hudson Line – Ongoing Normal Replacement	C&S Program, Track Program, Stations Program, Tunnel Program, Yard Track Program, Bridge Program, Miscellaneous Safety/Administration
	Metro-North Railroad Hudson Line High – Capacity Signal System Replacement (Harmon to Poughkeepsie)	Replace signal system from Croton-Harmon to Poughkeepsie, with new high-capacity and performance signal system

Table 3-3: Related Projects on Connecting Corridors (not included in the Selected Alternative) (continued)

State	Name	Project Description
NY	Hudson Line – Positive Train Control (Wayside) – CP 12-MP 75.76 (MTA Owned)	Install positive train control safety system to meet 2008 federal rail safety law along the Metro-North Railroad Hudson Line
	Hudson Line - Harmon Shop & Yard Upgrade - Phase V, Stage 2	Construction of the new Running Repair and Support Shop facility will complete the replacement of the functionally and physically obsolete existing facility
	Hudson Line - Upper Hudson Line Stations Improvements	Component-based renewal work at multiple stations on the Metro-North Hudson Line
	Flood Resiliency for Long Island City Yard (LIRR)	Construction of flood protections for the LIRR Long Island City Yard
CT	New Haven-Hartford-Springfield Rail Program Phases 1, 2 and 3A	Double tracking of the Hartford/Springfield Line between New Haven, CT, and Springfield, MA
	New England Central Railroad Freight Rail Project	State of good repair improvements and the upgrade of rail and track infrastructure to accommodate national standard in eastern Connecticut
MA	Merrimack River Bridge Rehabilitation	Rehabilitation of three bridges connecting from Boston to Haverhill and other northern locations, carry two railroad tracks over the Merrimack River in the city of Haverhill for Massachusetts Bay Transportation Authority (MBTA) Commuter Rail - Haverhill Line, Amtrak's "Downeaster" train, and Pan Am freight service
	South Coast Rail	Continued design, permitting, and "early action" improvements to rail ties, existing signal systems, crossings and several bridges in the South Coast Region
	Fairmount Line Improvement Project	Rehabilitate existing Uphams Corner and Morton Street stations, construct four new stations, reconstruct six existing railroad bridges, and construct new interlocking and an upgraded signal system
	MBTA Worcester Line Improvements/Service Expansion	Increase commuter rail service on the Framingham/ Worcester line between Boston and Worcester
	Springfield MA Union Station Project	Integrate multiple transit modes, restore Terminal Building and its central concourse, reopen and restore passenger tunnel, and accessibility improvements at Springfield MA Union Station

3.5 STUDY NEW HAVEN TO PROVIDENCE CAPACITY

The Selected Alternative calls for the states of Connecticut and Rhode Island, in cooperation with the FRA, to complete a New Haven to Providence Capacity Planning Study to identify on- and off-corridor infrastructure elements required to meet the long-term service and performance objectives of the Selected Alternative. The study area for the New Haven to Providence Capacity Planning Study should encompass the geographic area within the following approximate limits: along the Hartford/Springfield Line from New Haven to Hartford, from Hartford to Providence, and along the existing NEC from New Haven to Providence. This study area includes the areas considered for capacity expansion between Branford to Guilford, CT, and Old Saybrook, CT, to Kenyon, RI. The states of Connecticut and Rhode Island, in cooperation with the FRA, will determine the specific scope of the New Haven to Providence Capacity Planning Study. Completion of this New Haven to Providence Capacity Planning Study for this area will be a pre-condition to any Tier 2 projects that are intended to increase capacity in this area.

While the geographic focus of the New Haven to Providence Capacity Planning Study is in Connecticut and Rhode Island, outcomes from the study will necessarily influence passenger rail services north of Hartford to Springfield and north of Providence to Boston. As such, the FRA expects that Connecticut and Rhode Island will engage with Massachusetts and other appropriate stakeholders to identify and address how the New Haven to Providence Capacity Planning Study may address future rail services to Springfield and/or physical changes to the Hartford/Springfield Line and improved service from Providence to Boston. A continuing partnership between the FRA and the NEC states and railroads is essential to sustain the collaboration required to implement the Selected Alternative.

Modernization or state-of-good-repair improvements can proceed along the existing NEC between New Haven, CT, and Providence, RI, prior to the start of the New Haven to Providence Capacity Planning Study. Similarly, Related Project improvements to the Hartford/Springfield Line underway and planned by the State of Connecticut can advance, including double tracking and related infrastructure improvements between Hartford, CT, and Springfield, MA. The Selected Alternative does not include electrification of the Hartford/Springfield Line as proposed in the Preferred Alternative. The decision as to whether or not to electrify and more fully integrate the Hartford/Springfield Line service into the NEC depends on the outcome of the New Haven to Providence Capacity Planning Study. The Northern New England Intercity Rail Initiative study of service east and north of Springfield can also advance.

3.6 OTHER FEATURES OF THE SELECTED ALTERNATIVE

In addition to components described as part of the Selected Alternative, the FRA recommends that NEC stakeholders consider ways to enhance the NEC rail network and help to achieve the full benefits of the Selected Alternative. This includes additional rail planning and coordination on complex issues, such as expansion of capacity at Penn Station New York and capacity improvements between Baltimore, MD, and Wilmington, DE, integration of service to and from connecting corridors, station improvements, use of new technology and systems on the NEC, and development of common rolling stock and locomotive standards across the NEC. These issues are described in more detail below.

3.6.1 Continued Rail Planning

Interrelated or multi-jurisdictional, complex infrastructure elements included in the Selected Alternative may benefit from additional studies before initiating Tier 2 project studies. One such complex set of improvements are those to improve access and capacity into and out of Penn Station New York. The FRA recognizes that railroad operators, states, and interested parties will need to work together to clarify the scope and requirements of a group of infrastructure elements collectively referred to as the Penn Station Complex. A starting point for the discussion is work completed for the Hudson Tunnel Project and other ongoing Penn Station projects.

Additional planning will help clarify the scope and requirements for capacity expansion along sections of the NEC, such as between Bayview, MD, and Newport, DE, or between Newport and Edgemoor, DE. Considering these two segments together will allow decision-makers to ensure they advance these infrastructure elements in an efficient and beneficial way. Similarly, additional analysis may be appropriate where there are environmentally and culturally sensitive areas (for example, in the area of the Philadelphia segments[10]) or where there are state or railroad operator concerns (for example, the new segment between North Brunswick and Secaucus, NJ). In these cases, inclusive and comprehensive planning to identify project alternatives will help to both meet the service objectives and respect local concerns about expanding infrastructure outside the NEC right-of-way. This type of collaboration and pre-planning will allow the stakeholders to examine the approach to serving future market needs while also minimizing impacts on property and neighborhoods. This is particularly relevant for the North Brunswick to Secaucus, NJ, new segment that could require adding track capacity outside of the existing right–of-way in a densely developed area. The FRA encourages project sponsors to consider environmentally sensitive and cost-effective infrastructure solutions that are consistent with the Selected Alternative before embarking on Tier 2 project studies.

[10] There are three new segments in Pennsylvania, collectively referred to as Philadelphia Segments: 1) Baldwin, PA to Philadelphia 30th Street Station; 2) Philadelphia International Airport Station; and 3) Philadelphia 30th Street to Bridesburg, PA. See Volume 1, Chapter 4 of the Tier 1 Final EIS for additional information on these segments.

3.6.2 Connecting Corridors

The FRA encourages expanding the benefits of an improved NEC as an integrated rail network with through services and improved connections to connecting corridors. The connecting corridors to the existing NEC include south of Washington, D.C., to Richmond, Newport News, Norfolk, and Lynchburg, VA; west of Philadelphia to Harrisburg, PA; north of New York City to Albany, NY; and north of New Haven, CT, to Springfield, MA, and Vermont. The Selected Alternative's service and performance objectives incorporate improved services to/from these connecting corridors. The Selected Alternative anticipates the capacity and infrastructure elements necessary to expand the reach of the NEC to these connecting corridors as either direct, electrified service or as connecting services. The opportunity for Philadelphia's 30th Street Station and New Haven Station to have pulse-hub operation anticipates the integration of services to Harrisburg on the Keystone Branch and to Hartford, CT, Springfield, MA, and points north and east on the Hartford/Springfield Line. As the NEC Commission, the FRA, and other stakeholders develop the SDP, they should continue to coordinate with stakeholders representing the connecting corridors.

3.6.3 Station Improvements

Station improvements will be required to implement the increased service frequency and attain the integrated operations of the Selected Alternative. In particular, the Selected Alternative will create a more integrated rail network by including opportunities for easier transfers between service types. The Selected Alternative encourages configuration of stations to support efficient and convenient passenger connections between all types of passenger rail services using a station. Multimodal station access, including access via pedestrian, taxi, bicycle, and auto, car- and bike-sharing, on-demand services, and local transit services, is also encouraged.

The proposed changes in service in the Selected Alternative will require changes to the passenger amenity and circulation elements of stations, as well as the configuration and capacity of tracks and platforms. Appendix B, Definition of Decision Matrix and Schematic, includes a description of new or expanded service at stations included in the Selected Alternative.

Most stations on the NEC will require at least four tracks, each served by platforms that facilitate convenient transfers between service types. Project sponsors undertaking Tier 2 project studies for station improvements—and for track upgrades that pass through station areas—should ensure the proposed improvements reflect the service and performance objectives for both the station and the track and platforms areas. This will help ensure stations can accommodate future train and passenger volumes and can support the conflict-free operation of express and local services.

The FRA recognizes the challenges of achieving corridor-wide service and performance objectives, particularly given the multiple owners, operators, and governmental jurisdictions involved in the NEC. For some station improvements, the Selected Alternative identifies a large area within which a new or modified station is needed and a representative location. This approach allows flexibility for

owners, operators, and governmental entities to select specific locations for station improvement within the identified area during Tier 2 project studies. For example, the Selected Alternative identifies a new Intercity connection between New Carrollton and Baltimore-Washington International (BWI) Thurgood Marshall Airport Station, which was represented by upgrades to Odenton Station during the Tier 1 EIS analysis. During Tier 2 project studies, the owners, operators and governmental entities could decide an alternative location is more suitable. The FRA expects owners, operators, and governmental entities to collaborate and ensure station access and connectivity to the NEC.

3.6.4 Systems and Technology

The Selected Alternative encourages railroad owners and operators to adopt corridor-wide standards and best practices for improvements to systems and technology (track, structures, electrification, signals, communications, etc.) necessary for either modernizing or expanding the capacity of the NEC. Adoption of corridor-wide standards will make coordination easier between the various railroad owners and operators on the NEC as they implement individual projects. These corridor-wide standards should encompass the service and performance objectives of the Selected Alternative and serve as a starting point for defining systems requirements in Tier 2 projects. The FRA will consider these corridor-wide standards in determining the consistency of individual projects with the Selected Alternative (see Section 5).

The Selected Alternative includes upgrades to the NEC signaling system to permit higher-density operations needed to achieve the Selected Alternative's service and performance targets. (For further details about the specifications, see Chapter 4 of the Tier 1 Final EIS.) The Selected Alternative also includes specifications for the electrification systems, including overhead catenary, to support speeds on the existing NEC of up to 160 mph and speeds on new segments for up to 220 mph.

The FRA will continue to work with railroad owners and operators on evaluating new technologies to take advantage of emerging opportunities to create efficiencies and improve reliability and safety of an updated and improved NEC.

3.6.5 Rolling Stock

The Selected Alternative supports a dramatic increase in passenger rail service, both Intercity and Regional rail. The resulting operations on the NEC will require a well-maintained, highly reliable, and high-performance equipment fleet with consistent performance characteristics, including fast acceleration and deceleration. High-performance attributes reduce delays and help to maintain an efficient schedule and operating plan.

The Selected Alternative recommends that the operators across the NEC adopt common performance and technical specifications for rolling stock used on the NEC. The standards should support the travel time and service frequency objectives of the Selected Alternative, as well as meet

all applicable safety and air quality requirements. The development of common NEC rolling stock standards can be implemented over time, taking into account current equipment procurements and acquisition programs. Common standards will enable the NEC railroads to plan long-term rolling stock acquisition strategies that benefit from cost efficiencies and to advance the service and performance objectives of the Selected Alternative.

Common rolling stock standards could provide a number of important benefits:

- Efficiencies and cost savings in the procurement of rolling stock and rolling stock components, particularly given the large amount of equipment likely to be acquired over the next three decades
- Efficiencies in the maintenance of a large, NEC-common fleet, including the training of employees and the procurement of parts and supplies
- Ability to share equipment across operations to meet specific short- and long-term needs, particularly by Regional rail operators
- Safety and passenger convenience benefits of common equipment standards as regards minimizing the gap between the train and platforms at stations

In addition, a common set of NEC rolling stock standards will encourage adoption of compatible standards for train equipment that operates both on and off the NEC. A high degree of interoperability across the rail network will simplify operations and make for a more consistent travel experience for passengers.

One challenge for achieving a fully integrated rail network is that some connecting corridors and branch lines are not electrified. Electric propulsion, which makes possible higher speeds and faster acceleration, is required to achieve the NEC service frequency and performance objectives of the Selected Alternative. Use of dual-power locomotives, which are able to operate at high speeds using electric propulsion on the NEC and diesel propulsion off the NEC, would generate important trip time and capacity benefits for the following:

- Intercity trains entering the NEC from Charlotte, NC, Richmond, VA, and Springfield/Hartford, CT
- Regional trains joining the NEC from Regional rail branch lines in New Jersey, Connecticut, and Massachusetts

The significant increase in train service on the NEC will require a significant expansion of storage yards and maintenance facilities. While the Tier 1 Final EIS provided a high-level analysis of yard and maintenance facility needs and potential locations, operators will ultimately determine where best to add needed capacity based on the rolling stock they use and the types of service they operate. Implementation of enhanced service concepts—such as run-through service at Washington, D.C., and New York City—and use of common equipment will support new options for storage and

maintenance facilities shared by two or more operators. The FRA will work with operators on the NEC to explore ways in which to improve the efficiency of maintenance services, using technological advancements and modularity to speed maintenance and improve equipment utilization.

3.7 GEOGRAPHIC DESCRIPTION OF THE SELECTED ALTERNATIVE

The following provides a state-by-state summary of the infrastructure elements needed to achieve the service and performance objectives. Infrastructure elements are described by type of improvement (e.g., new track, curve modifications, etc.). Minor railroad improvements such as curve modifications or other speed and performance improvements, which could include limited expansion of existing NEC right-of-way, are not identified in the state-by-state summary.[11] Refinements to all of the identified projects as well as minor improvements or programmatic upgrades will be addressed in subsequent Tier 2 project studies. The FRA—or another federal agency providing funding for a particular project—will evaluate specific locations for new segments as part of the Tier 2 project studies, prior to making any decision regarding new segment locations. Considerations for Tier 2 project studies are located in Section 6.

The Selected Alternative includes corridor-wide modernization improvements to the NEC as required to bring the NEC to a state of good repair or to improve performance such as with curve realignments. These improvements would vary from state-to-state depending on the existing condition of the NEC, but are an underlying, corridor-wide assumption for the Selected Alternative. Therefore, a reference to these modernization improvements is not included in the state-by-state descriptions that follow. Major systems upgrades (catenary, signals, communications, etc.) are identified where appropriate for each geographic segment; although some portions of the NEC have been recently upgraded, any future systems upgrades in conjunction with the Selected Alternative will consider signal and communication systems in place on adjacent segments and include improvements as necessary to achieve corridor-wide service and performance objectives. Ongoing No Action Alternative (Table 3-1) and Related Projects (Table 3-2 and Table 3-3) will continue to advance in coordination with the projects called for in the Selected Alternative.

3.7.1 Washington, D.C.

The Selected Alternative includes NEC systems upgrades and high-density signaling between Washington Union Station and New Carrollton, MD. Washington Union Station is expanded to meet service and performance objectives, consistent with the Washington Union Station Expansion Project (a Related Project).

[11] The Selected Alternative infrastructure elements are not inclusive of all minor improvements or programmatic upgrades (i.e., curve adjustment, track realignment, signal improvements, catenary replacement, etc.) necessary to meet the service and performance objectives and for the safe and reliable operation of the NEC.

3.7.2 Maryland

The Selected Alternative includes systems upgrades between Washington, D.C., and New Carrollton to improve maximum speeds. From New Carrollton to Baltimore, the Selected Alternative provides a four-track railroad that accommodates service, frequency, and travel time objectives of the Grow Vision. Systems upgrades between Seabrook and West Baltimore Stations improve maximum speeds. Chokepoint relief projects at New Carrollton, Odenton, and BWI Thurgood Marshall Airport (BWI Airport) Rail Station west of BWI Airport provide four tracks between New Carrollton and Halethorpe. A new Intercity connection is provided between New Carrollton and BWI Airport Rail Station, represented by improved Intercity and Regional rail service at a modified Odenton Station. The existing Intercity and Regional rail station at New Carrollton is improved to accommodate the four-track NEC. The New Baltimore Tunnel segment included in the Selected Alternative is consistent with the ROD issued by the FRA for the B&P Tunnel Replacement Project (a Related Project) in March 2017.

From Baltimore to the Maryland-Delaware state line, the Selected Alternative provides a four- to six-track railroad. Three movable bridges—Gunpowder, Bush, and Susquehanna—are replaced in the Selected Alternative. Systems upgrades east of Baltimore Penn Station in Baltimore, Harford, and Cecil Counties include upgrades to existing track, catenary, and signal systems to improve maximum speeds. Curve modifications and new track projects east of Baltimore Penn Station are necessary to eliminate the chokepoint associated with the Union Tunnel; an additional new track project in northern Harford County expands the existing NEC to four tracks. A new Intercity and Regional rail connection between modified Baltimore Penn and Martin Airport Stations, represented in the Selected Alternative by a new station in Bayview, improves connectivity east of Baltimore. A new Regional rail station in Elkton improves connectivity to the NEC in northeast Maryland. A new two-track segment extends parallel to the NEC from Bayview, through Maryland into Delaware. New high-speed track capacity is necessary to achieve service, frequency, and travel time objectives between Washington, D.C., and New York City.

3.7.3 Delaware

The Selected Alternative includes systems upgrades to improve maximum speeds between the Maryland-Delaware state line and Newport Station, and between Edgemoor Station and the Delaware-Pennsylvania state line. New track between Newark, DE, and Newport builds out the existing NEC to four tracks, and new Regional rail stations in Newport and Edgemoor improve connectivity to the NEC. For the Selected Alternative, the Newark, DE, Station is modified and relocated to alleviate a chokepoint between NEC passenger and freight services. The State of Delaware, in partnership with public and private entities, is advancing a project to improve the existing Newark, DE, train station in its current location and expanding it into a transit center

(Newark Delaware Regional Transportation Center [NRTC], Table 3-1).[12] The FRA will coordinate with the NRTC project sponsors on the specific location and design of the modified Newark, DE, Station, when appropriate, and will incorporate these ongoing improvements to the extent practical. The new segment beginning in Bayview, MD (described in Section 3.7.2), continues through Delaware to Newport. The Wilmington new segment—extending from Newport to Edgemoor—provides additional capacity in northern New Castle County and provides valuable travel time savings for non-stop express services between Washington, D.C., and Philadelphia, PA. The Wilmington new segment is located separate from the existing Wilmington Station. Improved Intercity service to the existing Wilmington Station would be provided on the existing, upgraded NEC.

3.7.4 Pennsylvania

The Selected Alternative includes systems upgrades throughout much of the territory to improve maximum speeds on the NEC. A new Intercity and Regional rail connection to the NEC is provided between Chester and Eddystone Stations, represented by a new Baldwin Station. A new two-track segment improves access between Baldwin, PA, and Philadelphia 30th Street Station. A new Intercity connection is provided to a new Philadelphia International Airport station.[13] Philadelphia 30th Street is expanded, and Intercity service is increased at a modified Cornwells Heights station to accommodate the service objectives. A new segment between Philadelphia 30th Street and Bridesburg Stations, and curve modifications near Bridesburg and Holmesburg Stations, improve the NEC in North Philadelphia. Chokepoints are eliminated at Penn Interlocking (west of Philadelphia 30th Street Station and at the Trenton Yard access in Morrisville).

3.7.5 New Jersey

The Selected Alternative includes systems upgrades between North Brunswick and Jersey City to improve maximum speeds on the NEC. Chokepoint relief projects at a modified Metropark Station, south of Newark (Hunter Flyover), and in Essex and Hudson Counties (Westbound Waterfront Connection, and Portal Bridge and Sawtooth Bridge replacements) eliminate operating constraints along one of the busier segments of the NEC. An Intercity and Regional rail connection between Hamilton and New Brunswick—represented by a new North Brunswick station—improves access to metropolitan areas between Philadelphia and New York City. A new Intercity connection is also provided between a modified Newark Penn Station and an expanded Penn Station New York—represented by a modified Secaucus Junction Station. Improved Intercity service at an expanded Penn Station New York also improves passenger rail access to metropolitan areas. A new two-track

[12] The NRTC is funded in part by a $10 million TIGER IV grant that was awarded in June 2012; matching funds of $23.2 million have been raised by the State of Delaware, the City of Newark, New Castle County, the University of Delaware, and the Wilmington Area Planning Council.

[13] The new Intercity connection to Philadelphia International Airport would serve a new station and would complement existing SEPTA Regional rail service. Coordination regarding Intercity and Regional infrastructure and services would be addressed during subsequent Tier 2 project studies.

segment—roughly parallel to the NEC from North Brunswick through Newark to Secaucus—provides six-track capacity for northern New Jersey. Together, the Secaucus/Bergen Loop and new tracks under the Hudson River—along with a modified Secaucus Junction Station and expanded Penn Station New York—provide additional trans-Hudson capacity for the Selected Alternative.

3.7.6 New York

Curve modifications and chokepoint relief projects address NEC constraints in Bronx and Westchester Counties. New track on the Hell Gate Line between Queens and Bronx Counties provides for improved rail services to an expanded Penn Station New York. New stations at Hunts Point, Parkchester/Van Ness, and Co-op City provide Regional rail service to an expanded Penn Station New York from Bronx County. New Intercity connections are provided in Bronx and Westchester Counties, represented by a modified Morris Park station (also served by Regional rail) and a new Cross-Westchester station. New tracks in tunnel under the Hudson River to an expanded Penn Station New York, along with new tracks in tunnel under the East River to the Hell Gate Line, improve capacity between New Jersey and Manhattan and Manhattan and Queens.

3.7.7 Connecticut

From the Connecticut-New York state border to New Haven, the Selected Alternative includes capacity and modernization improvements to provide a four- to six-track railroad that meets the Selected Alternative's service, frequency, and travel time objectives. Systems are upgraded through Norwalk to improve capacity and reliability. Upgrades at a modified Stamford Station, plus a new Intercity connection located between Stamford and Bridgeport (represented in the Tier 1 EIS by a modified station at Greens Farms), improve Intercity connectivity to the NEC. New Regional rail stations in Barnum (East Bridgeport) and Orange improve connectivity to the NEC. A chokepoint relief project at a modified New Haven Station improves Intercity and Regional rail train movements in and out of the station. The Selected Alternative includes replacement of the Cos Cob, Saugatuck, and Devon movable bridges.[14] The new segment beginning in New Rochelle, NY, extends through Greenwich, Stamford, and Norwalk to Greens Farms. Additional high-speed track capacity is necessary to achieve the service frequency and travel time objectives between New York City and New Haven. The specific routing, location, construction type, and other design elements of this segment will be the subject of a subsequent Tier 2 environmental process.

Between New Haven and the Connecticut-Rhode Island border (just south of Westerly, RI), the Selected Alternative includes investments necessary to modernize the existing two-track railroad. Included in the modernization effort is replacement of the Connecticut River Bridge. Additional

[14] The Norwalk River Bridge Replacement project is currently being advanced by the Connecticut Department of Transportation and included as a No Action Alternative project (Table 3-1). It is an integral improvement to the Selected Alternative.

improvements will be subject to the findings of the New Haven to Providence Capacity Planning Study and subsequent Tier 2 environmental studies.

The ongoing project to upgrade the Hartford/Springfield Line between New Haven and Springfield, MA, will advance independently. Any enhancements or improvements to the Hartford/Springfield Line beyond those approved in the existing Finding of No Significant Impact[15] should be consistent with the outcome of the New Haven to Providence Capacity Planning Study or would be subject to a separate NEPA action. The FRA encourages local project sponsors to consider the service and performance objectives established for the Selected Alternative in defining future enhancements to the Hartford/Springfield Line.

3.7.8 Rhode Island

Between Westerly and Providence, the Selected Alternative includes investments necessary to modernize the existing two-track railroad. East of Providence, the Selected Alternative includes capacity and modernization improvements to provide a four-track railroad that meets the Selected Alternative's service, frequency, and travel time objectives. A new Regional rail station in Pawtucket improves connectivity to the NEC in northeast Rhode Island. New track is added between Pawtucket and the Rhode Island-Massachusetts state line. Additional improvements will be subject to the findings of the New Haven to Providence Capacity Planning Study. The State of Rhode Island (Rhode Island Department of Transportation [RIDOT]) and Amtrak recently examined a range of options for station improvements at T.F. Green Airport Train and Intermodal Station in Warwick, just south of Providence. The FRA will coordinate with RIDOT on any further study of improvements at this station to ensure consistency with the Selected Alternative.

3.7.9 Massachusetts

The Selected Alternative includes track and junction improvements between Canton Junction to Readville to relieve chokepoints and facilitate train movements. New track extending from the Rhode Island-Massachusetts state line to Sharon builds a portion of the NEC in Massachusetts to four tracks. The Neponset new segment between Sharon and Hyde Park provides additional

[15] The FRA approved the New Haven-Hartford-Springfield (NHHS) improvements in a Finding of No Significant Impact (FONSI) issued on August 9, 2012. The FONSI described a series of improvements to be implemented in phases. These improvements included constructing a second track for a portion of the corridor; installing improved train control systems; upgrading at-grade crossings and closing some at-grade crossings; repairing or replacing bridge and culvert structures; constructing a layover and light maintenance facility in the Springfield area; and developing new regional rail stations at Enfield, West Hartford, Newington, and North Haven. The New Haven-Hartford-Springfield corridor is referred to as the Hartford/Springfield Line in the Tier 1 EIS and ROD for NEC FUTURE.

capacity just outside of Boston. Boston South Station would be expanded, consistent with the Boston South Station Expansion and Layover Facility Project.[16]

3.8 COST

The NEC FUTURE capital cost model provides a documented and validated conceptual cost estimate for the Selected Alternative commensurate with the level of detail required in a Tier 1 EIS. Actual costs will differ after more-refined engineering and design work is completed, reflecting value engineering, selection of construction and staging methodologies, and price inflation/deflation. The methodology for estimating capital costs is consistent with the methodology described in the Tier 1 Final EIS, Volume 1, Appendix BB.

The Selected Alternative cost estimate provides a low and high range of capital costs consistent with the improvements defined for the Preferred Alternative from Washington Union Station to New Haven, CT, and from Providence, RI, to Boston, MA. The capital costs also include the range of potential improvements between New Haven, CT, and Providence, RI, that could result from the New Haven to Providence Capacity Planning Study.

The FRA developed a range of capital costs for the Selected Alternative using the capital costs from the Preferred Alternative and Alternative 2 presented in the Tier 1 Draft EIS. The cost of the Preferred Alternative represents the low end of the range. The high end is equal to the cost of the Preferred Alternative combined with the cost of the New Haven-Hartford-Providence new segment included in Alternative 2 (see Tier 1 Draft EIS, Volume 2, Chapter 4). The FRA believes these estimates represent a reasonable range of potential corridor-wide capital costs to implement the Selected Alternative.

Table 3-4 presents the capital cost estimates generated by the capital cost model for the Selected Alternative. The NEC FUTURE capital cost model generates conceptual costs for the end-to-end route of the Selected Alternative. As such, the model is not intended to estimate the costs of specific smaller-scale projects separately, such as individual bridge replacement projects.

The FRA did not estimate operations and maintenance (O&M) costs for the Selected Alternative. The estimates for O&M costs included for the Preferred Alternative in the Tier 1 Final EIS are representative of the range of O&M costs, which illustrated the feasibility of operating Intercity services without subsidy.

[16] South Station Expansion Project – EA No. 15028.
http://www.massdot.state.ma.us/southstationexpansion/Home.aspx

Table 3-4: Selected Alternative Capital Cost Estimate ($2014 millions)

FRA SCC	Description	Low	High
10	Track Structures and Track	$51,460	$70,590
20	Stations, Terminals, Intermodal	$6,960	$8,440
30	Support Facilities	$875	$935
40	Site work, Right-of-Way, Land, Existing Improvements	$25,810	$31,775
50	Communications & Signaling	$2,225	$2,675
60	Electric Traction	$3,415	$3,605
70	Vehicles	$6,350	$6,350
80	Professional Services	$11,685	$15,255
90	Unallocated Contingency	$3,320	$4,120
NA	No Action Alternative Projects	$9,330	$9,330
	TOTAL	**$121,000**	**$153,000**

Source: NEC FUTURE team, 2017
Note: Columns may not add to the total due to rounding

3.9 KEY BENEFITS OF THE SELECTED ALTERNATIVE

The Selected Alternative will improve the NEC by expanding capacity and improving service to grow the role of rail. The Selected Alternative modernizes the NEC to a state of good repair, and encourages enhanced passenger rail operations to meet corridor-wide service goals. Modernizing the NEC will accomplish the foundational improvements necessary to maintain safe, reliable operations throughout the NEC. Additional capacity and chokepoint elimination will substantially reduce operating conflicts—such as when one train must wait for another—between passenger trains and with freight rail operations.

The Selected Alternative will improve the reliability, capacity, connectivity, performance, and resiliency of passenger rail services on the NEC to meet future Northeast mobility needs for 2040 and beyond. In short, the Selected Alternative provides more-reliable and frequent train travel with easy connections to more places and shorter travel times. Limited-stop Intercity-Express service envisioned for the Selected Alternative will offer competitive trip times and substantial operating profit potential that could support public-private partnership financing. The potential of the rail travel market, as shown in the NEC FUTURE analysis for the Selected Alternative, increases the attractiveness of private investment for those improvements. The potential of the rail travel market is illustrated most dramatically at key screenlines along the NEC to measure travel at major markets. As ridership is expected to grow 70 percent at the Penn Station New York screenline, growth into Washington Union Station is forecast to be greater than 80 percent, and growth into Boston South Station increases by almost 50 percent (Tier Final EIS, Volume 1, Chapter 9).

As the Selected Alternative is implemented and improvements come online, it will enable operators of the NEC rail network to adopt service concepts that will enhance the passenger rail experience. Improved passenger experience with common-ticketing and more-convenient schedules and connections will make rail a user-friendly transportation option. Enhanced service concepts can

fundamentally change the passenger experience by integrating Intercity and Regional rail ticketing, operations, and services, as well as incorporating a new corridor-wide Metropolitan-type service to connect Local stations (offering Regional rail services) with Hub and Major Hub stations (offering both Regional and Intercity services). Better intermodal connections will be created by concentrating improvements on urban Hub stations well served by transit and by allowing for convenient airport access with frequent Intercity and Regional service.

By operating the railroad as a coordinated system, the Selected Alternative will enable better service. Coordinated operations along with expanded capacity and redundancy will also make the NEC rail network more resilient to weather—including catastrophic weather events—and will reduce service disruptions. In addition to BWI Airport and Newark Liberty International Airport, the service concepts in the Selected Alternative will add a new connection to Philadelphia International Airport, with frequent Intercity service.

The Selected Alternative will support economic development as it strengthens the existing rail network and transportation system by giving people better access to urban centers, jobs, and destinations throughout the Northeast region. Finally, the Selected Alternative makes it possible to improve the NEC in phases, with less disruption to passengers and cost savings. Near-term benefits can be achieved and flexibility maintained by expanding capacity incrementally to adapt to market conditions and future funding availability.

4. Environmental Effects and Measures to Avoid and Minimize Harm

4.1 TIERED NEPA PROCESS

Under NEPA, there are various levels of environmental review that can be undertaken by an agency. The level of detail and analysis conducted is determined by the degree to which the proposed action may result in significant impacts, establishes a precedent for future actions, or is considered to be a major federal action or an environmentally controversial issue. NEPA also provides the flexibility to assess projects in a staged approach known as tiering. Tiering addresses broad programs and issues in an initial (Tier 1) or programmatic level analysis, and analyzes site-specific, project-level (Tier 2) proposals and impacts in subsequent studies. The FRA determined a Tier 1 EIS was the appropriate level of NEPA documentation for NEC FUTURE due to the nature of the decision to be made, the complexity of the NEC, and the multi-jurisdictional nature of the passenger rail operations. This ROD documents the FRA's decision on a Selected Alternative to advance into subsequent Tier 2 project studies. The ROD serves as the closure of the Tier 1 NEPA process. The Tier 2 process for subsequent project studies is discussed in Section 6.

4.2 SUMMARY OF ENVIRONMENTAL EFFECTS

The summary provided in this section relies on the analysis and findings presented in the Tier 1 Final EIS. The analysis of environmental effects presented in the Tier 1 Final EIS is based on readily available information such as reports, mapping, and secondary source data. The Tier 1 Final EIS provides more information on a resource-specific basis (see Tier 1 Final EIS, Volume 1, Chapters 5–7). Appendix A includes corrections and clarifications to the Tier 1 Final EIS based on feedback the FRA received after the release of the Tier 1 Final EIS.

The Selected Alternative will result in service-related effects, footprint or physical effects, and indirect and cumulative effects on the built and natural environment. Service-related effects result from changes in the existing rail service, such as increased frequencies or speeds. Footprint or physical effects result from expanding existing infrastructure or providing new infrastructure to support the proposed rail service. Service-related and footprint effects can result in indirect and cumulative effects, such as induced growth and contribute to cumulative impacts on natural resources.

4.2.1 Service-Related Effects

As stated in the Tier 1 Final EIS, Volume 1, Chapter 5, service provided by the implementation of the Selected Alternative will dramatically change rail transportation in the Northeast by providing up to five times as much Intercity rail service, significantly reducing trip times, increasing frequency of Regional trains, and ultimately providing a more reliable service. These service changes will result in

a range of environmental and economic effects. The service changes will provide for safer travel along the NEC and greater access to locations along the NEC, including employment centers and parks. Additionally, the implementation of the Selected Alternative will result in changes to economic activity throughout the Study Area (see Tier 1 Final EIS, Volume 1, Chapter 6). While some of these changes will be more immediate, others will occur over a period of time. Increased frequencies in train service and more direct rail connections will expand access to existing labor markets and benefit business productivity. An expanded range of service and price options will result in the ability for travelers to weigh the effects of travel costs versus time and provide travelers more flexibility and potential travel-cost savings. The expansion of rail services under the Selected Alternative will result in more immediate construction jobs as well as additional hiring to operate and maintain the expanded rail service.

Changes in service levels and speeds also will result in changes in noise and vibration, air quality, and energy consumption. Implementation of the Selected Alternative will result in net benefits to air quality within the Study Area and a net total decrease in emissions of greenhouse gases. Service changes will result in an overall decrease in energy use.

4.2.2 Footprint-Related Effects (Physical Effects)

Footprint-related effects will likely occur in any location where infrastructure elements are repaired, replaced, rehabilitated, or newly constructed. Impacts will be more likely where infrastructure elements are proposed to provide for increased capacity. However, impacts to resources may also occur within and adjacent to the existing NEC rail right-of-way. Potential footprint-related effects may include the following:

- Conversion or changes in land cover
- Conversion of agricultural lands to transportation use
- Use of or conversion of wildlife refuges/parkland/recreational areas (conversion of Section 4(f) and Section 6(f) resources to transportation use)
- New or expanded water crossings
- Dredge and fill of wetlands
- Encroachment or fill of floodplains
- Degradation of water quality
- Effects on coastal resources
- Habitat loss and fragmentation
- Impacts on threatened and endangered species
- Degradation of potable water

- Exposure to geologic hazards (naturally occurring asbestos, karst terrain, landslide susceptibility, acid producing soils)
- Disturbance of and exposure to hazardous waste and contaminated materials
- Direct physical disturbance or proximity effects on cultural and historic resources
- Changes in visual and aesthetic characteristics of an area
- Effects on Environmental Justice communities
- Noise and vibration effects
- Increased susceptibility to coastal and riverine flooding
- Temporary construction-related effects, including temporary effects on air quality and disruption of traffic

4.2.3 Indirect and Cumulative Effects

The Selected Alternative has the potential to contribute to indirect and cumulative effects. Induced growth is a likely outcome of implementing the Selected Alternative. The Selected Alternative will provide greater options for connecting travelers to places of employment and residences. This may result in increased development densities around stations and people choosing to live farther from rail-connected markets and driving to nearby stations. Expansion of infrastructure in these areas could result in environmental impacts to resources. Furthermore, service-related and footprint or physical effects associated with NEC FUTURE could contribute cumulatively to effects on like resources by other projects within the Study Area.

4.3 POTENTIAL MEASURES TO AVOID AND MINIMIZE HARM

The FRA's decision avoided and minimized harm to the extent practicable for a broad scale program such as NEC FUTURE. Throughout the alternatives development process, the FRA considered the relationship of routing, construction types, and existing conditions to minimize potential impacts.

Where practicable, the FRA adjusted elements of the Selected Alternative to avoid and minimize harm. The infrastructure elements approved in the Selected Alternative are the same that were evaluated and identified as part of the Preferred Alternative in the Tier 1 Final EIS for the areas between Washington, D.C., and New Haven, CT, and between Providence, RI, and Boston, MA. In identifying these infrastructure elements, the FRA considered shifting routes and identifying construction types (e.g., aerial structure, tunnels, at-grade, embankment) that would minimize impacts on wildlife refuges, wetlands, water resources, ecological resources, and communities. For example, in identifying the Preferred Alternative, the FRA shifted the Preferred Alternative route near the Philadelphia Airport so that it would be adjacent to CSX rights-of-way and would minimize new impacts to the John Heinz National Wildlife Refuge. This same minimization strategy was carried over for the Selected Alternative. In addition, the Selected Alternative includes a

requirement for a New Haven to Providence Capacity Planning Study to further consider how to add capacity in this area that at the same time would avoid and minimize effects on the built and natural environment.

In the Tier 1 Final EIS, the FRA proposed the following two potential commitments to mitigate impacts associated with the Preferred Alternative:

- Avoiding substantial crossings of National Wildlife Refuges (such as the crossing shown in Alternative 3 in the area of Patuxent Research Refuge) and minimizing impacts to National Wildlife Refuges.
- Avoiding use of an aerial structure in the historic district of Old Lyme, CT.

The Selected Alternative does not adopt these commitments. The Selected Alternative does not adopt the proposed commitment regarding National Wildlife Refuges because this site-specific commitment is not practicable or appropriate at the Tier 1 level of review. Appropriate mitigation for National Wildlife Refuges will be considered at Tier 2. The Selected Alternative does not adopt the proposed commitment regarding the use of an aerial structure in the historic district of Old Lyme, CT, because the Selected Alternative does not include infrastructure elements in or near Old Lyme; therefore, this proposed commitment is not practicable mitigation reasonably related to the Selected Alternative.

The FRA based its Tier 1 impact assessment on readily available information and did not perform field studies. Accordingly, site-specific conditions have yet to be confirmed. At Tier 2, project sponsors will consider measures to avoid and minimize harm, as appropriate. General types of resource-specific measures to avoid and minimize harm are presented in the Tier 1 EIS and include the following:

- Incorporating design or construction modifications to avoid conversion of a resource
- Using context-sensitive design in future stages of project development
- Minimizing activity in and placement of permanent infrastructure in sensitive areas such as wetlands, floodplains, coastal areas, and ecologically sensitive habitat
- Coordinating with property owners and stakeholders
- Coordinating with agencies to determine time-of-year restrictions for construction activities in ecologically sensitive areas
- Using containment management for hazardous waste and contaminated materials
- Completing appropriate documentation of resources as needed (e.g., biological assessments, wetland delineations, Historic American Building Survey/Historic American Engineering Record–

level documentation as appropriate for properties that cannot be avoided, archaeological data recovery for sites that cannot be avoided or preserved in place, etc.)

- Mitigating cultural resource impacts using the framework presented in the NEC FUTURE Section 106 Programmatic Agreement

Long- and short-term effects will require consideration during design and engineering. Measures to minimize harm and avoid resources during construction will be identified, as appropriate, once construction types and methods are determined.

4.4 ENVIRONMENTALLY PREFERABLE ALTERNATIVE

CEQ regulations implementing NEPA require an agency to identify an environmentally preferable alternative (40 C.F.R. 1505.2). CEQ's *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations* describes the environmentally preferable alternative as "the alternative that will promote the national environmental policy as expressed in the NEPA, Section 101."[17] The Selected Alternative meets the following goals of Section 101 of NEPA:

- It fulfills environmental responsibilities to future generations by securing environmental quality.
- It supports achieving a balance between population and resource use.

The Selected Alternative results in a better-integrated rail network with corridor-wide transportation benefits. The number and frequency of trains increase, attracting a greater proportion of trips to rail and accommodating the growth in population and employment projected for the Northeast. By providing transportation options that support a reduced reliance on individual automobile trips and focusing development in already urbanized areas, the Selected Alternative protects environmental resources and quality. The FRA determined through its analysis that the Selected Alternative provides the best balance to meet national and regional goals for passenger rail transportation in the Northeast while minimizing physical impacts to the built and natural environment. The Selected Alternative focuses improvements on the existing NEC and strategically identifies new infrastructure elements to meet capacity needs. Therefore, when compared to the No Action Alternative and Action Alternatives, the Selected Alternative, as described in Section 3 of this ROD, is the FRA's environmentally preferable alternative.

[17] *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations*, 46 Federal Register 18026 (March 23, 1981) ("Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative that best protects, preserves, and enhances historical, cultural, and natural resources.")

5. Implementing the Selected Alternative

The identification of the Selected Alternative in this ROD concludes the NEC FUTURE Tier 1 NEPA process. The ROD sets the stage for advancing the four components of the Selected Alternative: improve rail service, modernize NEC infrastructure, expand rail capacity, and study New Haven to Providence Capacity. The Selected Alternative establishes corridor-wide service and performance objectives and a corridor-wide commitment to modernize the NEC, and identifies geographic-specific infrastructure elements. The service objectives, however, do not specify how to implement service or who should implement that service.

To support progress toward implementing the Selected Alternative, the FRA commits to ongoing collaboration with the stakeholders to facilitate decision-making about the complex, corridor-wide improvements envisioned by the Selected Alternative. Important next steps include development of the SDP and the planning of Tier 2 project studies.

Advancing the Selected Alternative will require continuous coordination and collaboration among agencies and stakeholders; continued rail planning, including the creation and periodic update of an SDP; and a process for establishing consistency of NEC passenger rail investments with the Selected Alternative. The following sections describe possible agency roles, the SDP, and consistency criteria.

5.1 FRA

The FRA will continue involvement, to the extent authorized, in advancing the Selected Alternative by reviewing consistency of related actions and Tier 2 projects with the Selected Alternative, playing an active role in SDP efforts, and participating in the New Haven to Providence Capacity Planning Study. The FRA will also continue close coordination with the NEC Commission, Amtrak, U.S. DOT modal agencies, NEC states, and rail operators to advance elements of and promote consistency with the Selected Alternative. The FRA's role in advancing the Selected Alternative may include the following:

- Developing the SDP.
- Convening an NEC FUTURE SDP Working Group to define an initial phase of implementing the Selected Alternative.
- Working with the NEC Commission to advance and implement their 5-Year Capital Plan and to ensure its consistency with the Selected Alternative.
- Working with NEC states and railroads, as well as with the FTA, to plan and prepare for subsequent Tier 2 project studies required to implement the Selected Alternative.
- Serving as lead agency in the Tier 2 process for individual projects when FRA funding or other FRA approval is required.

- Serving as a cooperating agency (if invited) when the FTA or another federal agency is serving as the lead agency for a Tier 2 project.
- Making the data developed in the Tier 1 process available, as appropriate, to other agencies and railroad stakeholders for their use in future project-level and planning studies.
- Facilitating discussions between NEC stakeholders to support agreements on funding, planning, project implementation, construction phasing, and management of work.
- Working with NEC operators to implement projects and improvements that enhance the customer experience.
- Participating in the development of programmatic approaches to environmental mitigation for the Selected Alternative.
- Implementing the FRA's commitments under the Section 106 Programmatic Agreement.

5.1.1 FRA Commitments

As part of the Selected Alternative the FRA commits to the following:

- The FRA commits to ongoing collaboration with the stakeholders to facilitate decision-making about the complex, corridor-wide improvements envisioned with the Selected Alternative, such as collaboration with the NEC Commission on the SDP and continued involvement in corridor-wide planning and on technical evaluation of new technologies or other system elements.
- To the extent authorized, the FRA will review projects for consistency with the service and performance objectives defined for the Selected Alternative and will encourage other agencies to use consistency criteria for evaluation.
- The FRA commits to working with Connecticut and Rhode Island to identify, in coordination with Massachusetts and other stakeholders as appropriate, on- and off-corridor infrastructure to expand railroad capacity between New Haven, CT, and Providence, RI, as part of the New Haven to Providence Capacity Planning Study.

5.2 AGENCY ROLES

The roles and responsibilities of federal, state, and operating agencies will vary. Where Tier 2 project studies result in a NEPA review (due to use of federal funds, approvals, or permits), the appropriate federal agency or agencies could become involved as a lead, cooperating, or participating agency. For projects that may not require compliance with NEPA, project sponsors (likely state or operating agencies) will advance elements of the Selected Alternative. Most agencies listed in the following sections will have an ongoing role in rail planning.

5.2.1 FTA

The FTA has been an active participant in NEC FUTURE as a cooperating agency under NEPA and an invited signatory to the NEC FUTURE Section 106 Programmatic Agreement. As a cooperating agency, the FTA may elect to adopt the findings of, or a portion thereof, of the Tier 1 Final EIS for the proposed action and issue its own ROD as appropriate and likely at the time at which FTA has a funding role in the advancement of a project on the NEC. In its ROD, the FTA could include any particular caveats or limitations that may be important to the FTA based on its statutory authority or regulatory requirements. Of particular relevance are the FTA requirements for coordination with MPOs as part of its grant-making process. Regardless of the nature of an FTA ROD, many of the Tier 2 project studies will involve Regional rail services (i.e., commuter rail services) and ongoing coordination with MPOs in the Study Area will be necessary for candidate Tier 2 project studies that may be funded under FTA programs. The FRA will continue to collaborate with the FTA to address consistency of Tier 2 actions with the Selected Alternative.

5.2.2 NEC Commission

The FRA coordinates closely with the NEC Commission, which was established through federal legislation to promote mutual cooperation and planning for the NEC. The NEC Commission members include representatives from the U.S. DOT, the NEC states, Amtrak, and non-voting representatives of the freight railroads that operate over the NEC. Connecting corridor states and commuter railroad operators on the NEC also participate as non-voting representatives. The NEC Commission administers the Northeast Corridor Commuter and Intercity Rail Cost Allocation Policy, which determines how the NEC railroad owners and operators allocate a variety of shared-benefit costs across the rail network. The NEC Commission also leads an annual collaborative planning process to develop a five-year Capital Investment Plan and One-Year Implementation Plan that informs short- and medium-term capital work along the NEC. The NEC Commission is also identified as the entity responsible for updating the SDP not less than every 10 years.[18]

The FRA intends to foster continued corridor-wide rail planning in partnership with the NEC Commission in advancing implementation of the Selected Alternative. The NEC Commission is statutorily required to develop an annual capital plan for the NEC and to update the SDP (Section 5.3). The NEC Commission, in coordination with the FRA, will be the forum for the NEC states and railroads to prioritize infrastructure elements and to address the railroad coordination necessary to achieve the Selected Alternative's service and performance objectives.

5.2.3 Metropolitan Planning Organizations

The metropolitan planning organizations (MPO) of the Northeast region play a critical role in transportation analysis and decision-making in their respective metropolitan regions, and as such

[18] Fixing America's Surface Transportation (FAST) Act, Section 11306 (49 U.S.C. § 24904).

have served as partners for NEC FUTURE, both on technical and policy levels. The continued involvement of the MPOs will be critical in implementing the Selected Alternative. There are approximately 50 MPOs in the Study Area. Some U.S. DOT modal agencies require that projects be listed in the relevant transportation plan or other long-range planning documents before funding is approved. Project sponsors should work with MPOs to ensure projects are included in such planning documents.

5.2.4 Railroad Owners and Operators

The NEC is owned and operated by multiple entities, and as such, establishing a coordinated approach to planning and implementing the Selected Alternative is critical and will involve a partnership of the federal government, as led by the U.S. DOT, the NEC states, Amtrak, and individual railroad owners and operators. The SDP process includes avenues for continued coordination among these key stakeholders. Railroad owners and operators are encouraged to share updates to their respective service planning and infrastructure so they are fully considered throughout the implementation of the Selected Alternative.

5.3 SERVICE DEVELOPMENT PLAN

Integral to implementing the Selected Alternative will be coordinated service and investment planning through the SDP. The SDP is the long-range implementation plan through which the NEC stakeholders will establish priorities and determine how to advance the improvements necessary to achieve a Grow Vision. The SDP process will maintain a corridor-wide focus for investments and provide a platform for considering implementation strategies, including the phasing of work and development of approaches for the efficient use of construction outages. The SDP will provide a summary of the Selected Alternative, identify priority projects, and define additional planning to coordinate implementation of projects across the NEC. The FRA will work closely with the NEC Commission in developing the SDP and continued corridor-wide planning.

5.4 CONSISTENCY WITH THE SELECTED ALTERNATIVE

For FRA-funded projects or projects that require FRA approval, the FRA will consider a Tier 2 project's consistency with the Selected Alternative when determining whether to approve funding for the project. In addition, the FRA will encourage other federal agencies to consider consistency of proposed projects with the Selected Alternative for projects in which those agencies have an approval role.

The FRA will consider a Tier 2 project's ability to meet or incrementally meet established corridor-wide and geographic elements, provided in Appendix B, Definition of Decision Matrix and Schematic, when determining a project's consistency with the Selected Alternative. In general, the consistency evaluation will address the following elements:

- Corridor-wide and geographic service and performance objectives
- Corridor-wide integration and connectivity elements
- Corridor-wide resiliency and redundancy
- Continued corridor-wide planning
- Geographic infrastructure elements that support the Selected Alternative by the following:
  - Eliminating chokepoints
  - Providing capacity (new track or new segments)
  - Making curve modifications and eliminating speed restrictions
  - Replacing aging or deficient infrastructure (i.e., bridges)
  - Providing sufficient station capacity and systems upgrades
  - Considering storage and maintenance yards

5.4.1 Consistency Criteria

The criteria in Table 5-1 provide a framework for evaluating consistency with the Selected Alternative. The FRA will use these criteria when assessing consistency with the Selected Alternative, and will encourage other agencies and project sponsors to use these criteria as guidance to inform project development (from early concept to alternatives analysis and design) and implementation (from permitting to construction and operation). The FRA intends the consistency criteria described in Table 5-1 to be used to:

- Define and evaluate project-specific scopes and sequencing.
- Support federal and state agency approval of projects.
- Support regional planning agencies in determining project consistency with the overall NEC FUTURE vision.
- Inform project sponsors on how consistency with NEC FUTURE will be evaluated/determined by federal funding agencies.
- Guide implementation from the conceptual roadmap defined in this ROD for the Selected Alternative to the specifics needed to define projects.
- Promote an integrated passenger rail network that meets Intercity and Regional rail service needs.

Table 5-1: Consistency Criteria

Tier 1 Decision	Consistency Criteria
Corridor-wide Vision	■ Supports level-of-service and connectivity between markets/city-pairs ■ Supports travel time objectives between city-pairs ■ Supports the concept of an integrated rail network and provides for increased connecting corridor service ■ Supports a balance of services to address multiple travel needs—Intercity, Regional, commuter, business, occasional, etc.
Improve Rail Service	■ Supports corridor-wide service frequency targets ■ Supports corridor-wide travel time targets ■ Supports enhanced operating concepts including pulse-hub and slot-based schedule operations and integrated scheduling and ticketing ■ Supports conflict-free operations of both local and express services on the NEC and at stations ■ Promotes a mix of services in response to varied market needs—with regard to frequency, travel time, and fares for Hub and Major Hub stations ■ Supports design speed targets for NEC and off-corridor capacity ■ Encourages best practices with regard to overall railroad operations (e.g., integrated service planning and scheduling) ■ Supports rolling stock and systems and technology corridor-wide standards ■ Enhances the passenger experience (e.g., improves access to stations and trains, supports more-convenient transfers between trains, incorporates better signage and customer information, and applies new technology to simplify trip planning and ticketing) to increase attractiveness of passenger rail service
Modernize NEC Infrastructure	■ Supports bringing NEC to a state of good repair ■ Replaces outdated track and systems with modern technology ■ Considers opportunities for future expansion when modernizing existing NEC ■ Adapts or hardens existing infrastructure vulnerable to inundation, extreme weather, or other unforeseen events
Expand Rail Capacity	■ Provides infrastructure elements to achieve service and performance objectives, including chokepoint relief projects, new track, curve modifications, bridge replacement, new segments, station improvements and systems upgrades. ■ Supports level-of-service and connectivity between markets/city-pairs ■ Supports travel time objectives between city-pairs ■ Supports enhanced operating concepts including pulse-hub and slot-based schedule operations and integrated scheduling and ticketing ■ Supports conflict-free operations of both local and express services on the NEC and at stations ■ Supports design speed targets for NEC and off-corridor capacity

6. Tier 2 Project Studies

The NEC FUTURE Tier 1 EIS sets the framework for years to come to implement the Selected Alternative. The analysis prepared by the FRA throughout the NEC FUTURE process identified this as a right-sized solution for the NEC—balancing needs, costs, and growth. The Selected Alternative allows project sponsors to fix problems on the NEC today while planning for future growth.

Tier 2 project studies related to NEC FUTURE will benefit from the analysis, coordination, and planning completed for the NEC FUTURE Tier 1 EIS. Additionally, this ROD provides considerations for advancing the Selected Alternative that should be reflected in Tier 2 project studies. This section describes how future project sponsors can use the Tier 1 EIS to streamline and gain efficiencies, considerations for Tier 2 project studies and resource and regulatory compliance for Tier 2 project studies. This discussion focuses on Tier 2 NEPA-related federal actions, such as using federal funds or obtaining a federal permit/clearance. Non-federally funded or permitted projects are not subject to the provisions of NEPA (although they may be subject to state environmental review laws); as such, these projects will benefit from the information and framework provided by NEC FUTURE.

6.1 USE OF THE TIER 1 EIS IN TIER 2 PROJECT STUDIES

This Tier 1 ROD does not provide funding for or allow construction to begin on the Selected Alternative and does not clear or obtain permits for any construction activity to begin. Rather, as described in Section 4, the NEC FUTURE Tier 1 EIS provided a programmatic level of analysis of environmental impacts. Subsequent, more-detailed (Tier 2) environmental reviews by the FRA and other federal agencies will analyze site-specific project elements and impacts.

Tier 2 project sponsors may incorporate and reference the decisions and analyses conducted as part of this Tier 1 review. The Tier 2 projects that follow the Tier 1 decision will occur over a period of several decades. Tier 2 NEPA actions will range from Categorical Exclusions to EISs, and will be led by different project sponsors, and even different lead agencies. The lead federal agency will determine the appropriate NEPA Class of Action for each Tier 2 project study. Consistent with the NEPA process, public and agency involvement is an important element. As each Tier 2 project study progresses, the project sponsor will develop additional engineering, design, and construction methods, and identify site-specific mitigation for unavoidable impacts as appropriate and consistent with other applicable regulatory requirements. Tier 2 project sponsors will obtain all applicable permits and clearances as part of the Tier 2 project studies prior to construction and implementation.

The Tier 1 Final EIS provides a compendium of information that Tier 2 project sponsors should consider the starting point for their evaluations. Sufficient details are provided in the Tier 1 Final EIS and in this ROD to guide these next steps without limiting the opportunities for local or regional

sponsors to incorporate innovations or to reflect local or more immediate needs. The NEC FUTURE Tier 1 EIS process streamlines and creates efficiencies for Tier 2 project sponsors by the following:

- Minimizing the duplication of effort at Tier 2 by providing ability to incorporate by reference elements of the Tier 1 EIS
  - Relying on the Purpose and Need established for NEC FUTURE.
  - Narrowing the range of alternatives to be considered during Tier 2 project studies.
- Providing a starting point for data collection and analytic methods.
- Informing scopes of work for Tier 2 project studies.
- Identifying needed Tier 2 project resource and regulatory compliance.
- Familiarizing agencies, the public, and stakeholders with the improvements included as part of the NEC FUTURE Selected Alternative.
- Establishing tribal coordination.
- Creating a Section 106 Programmatic Agreement to guide Tier 2 undertakings.

In some instances, the analysis completed for the NEC FUTURE Tier 1 EIS process may be sufficient for a Tier 2 project and no additional analysis will be needed for a particular resource area. This decision will be determined on a case-by-case basis and will depend on the action, the designated NEPA Class of Action, and coordination with the lead federal agency and appropriate resource and regulatory agencies. This may apply to any resource, depending on site-specific conditions, but in particular the following resource topics:

- Representative Service Characteristics
- Economic and Growth Effects, Indirect Effects
- Consistency with Regional Plans
- Energy
- Electromagnetic Fields and Electromagnetic Interference
- Cumulative Effects
- Irreversible and Irretrievable Commitment of Resources

6.2 CONSIDERATIONS FOR TIER 2 PROJECT STUDIES

With the Selected Alternative, the FRA is establishing a roadmap for future investment on the NEC, helping to ensure investments made by a variety of stakeholders contribute toward the shared NEC FUTURE vision. As appropriate, coordination among stakeholders and planning studies may be

conducted prior to advancing Tier 2 projects to consider location-specific constraints and opportunities. To advance the elements of the Selected Alternative, described in Section 3, Table 6-1 provides consideration for post-ROD coordination and Tier 2 project studies.

Table 6-1: Tier 2 Considerations by NEC State

NEC State	Considerations for Tier 2 Project Studies
Washington, D.C.	Coordination of ongoing Long Bridge, L'Enfant Plaza, and Ivy City Yard Related Projects not included in the Selected Alternative, and the included Washington Union Station Expansion Related Project.
Maryland	Coordination of ongoing BWI Station/Platform, B&P Tunnel and Susquehanna River Bridge Replacement Related Projects.
Delaware	Coordination with the State on the Newark, DE, station project, scheduled to begin construction in spring 2017.
Pennsylvania	Minimizing impacts from new segments to John Heinz National Wildlife Refuge and Section 4(f) resources, including Fairmont Park and the Philadelphia Zoo between Philadelphia 30th Street Station and Bridesburg, PA, to the maximum extent possible. Additional commitments include coordination with the Southeast Pennsylvania Transportation Authority, the City of Philadelphia, and CSX regarding the Philadelphia International Airport access.
New Jersey	Additional coordination with owners and operators regarding on station designation in central New Jersey, coordination on the Portal Bridge Replacement and Trans-Hudson River tunnel projects, and pre Tier 2 planning efforts for the Penn Station New York complex. Additional commitments include planning for future growth (beyond 2040) from Secaucus, NJ, through Sunnyside Yard in Queens, NY.
New York	Coordination with the state and owners and operators on the Hudson Tunnel Project, and additional coordination with owners and operators on pre Tier 2 planning efforts for the Penn Station New York complex.
Connecticut	Results of the New Haven to Providence Capacity Planning Study.
Rhode Island	Results of the New Haven to Providence Capacity Planning Study.
Massachusetts	Coordination with the state on the South Station Expansion Project.

6.3 TIER 2 RESOURCE AND REGULATORY COMPLIANCE

Based on the scope of the NEC FUTURE environmental analyses, further compliance with certain resource and regulatory requirements may be required as part of Tier 2 project studies. The lead federal agency and/or project sponsor of the Tier 2 project studies should use information and findings of the NEC FUTURE Tier 1 EIS as a starting point in continuing discussions with resource agencies to meet all requirements of applicable regulations. The following summarizes the coordination and work completed toward compliance with Section 7 of the Endangered Species Act, for Section 106 of the National Historic Preservation Act, and Section 4(f) of the U.S. Department of Transportation Act as part of NEC FUTURE.

6.3.1 Section 7 of the Endangered Species Act

The FRA coordinated closely with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) to develop the effects-assessment methodology used and to determine

the appropriate level of consultation needed for the NEC FUTURE Tier 1 EIS. As part of that coordination, the USFWS and NMFS indicated that identification and conclusive determination of effects to resources protected under the Endangered Species Act will not be meaningful based on the programmatic assessment conducted. Based on the input from USFWS and NMFS, the FRA determined Section 7 consultation requirements are appropriately addressed during the Tier 2 process, when a Tier 2 project is more fully defined. As specific projects are identified, the FRA or other federal agencies, as appropriate, will work with the USFWS and NMFS to determine the scope and timing of Section 7 consultation.

Section 7 consultation for Tier 2 projects may occur independently (i.e., project-by-project basis) or through a more inclusive "batching" of programmatic review process, as determined by the applicable federal lead agencies in coordination with USFWS and NMFS. Tier 2 Section 7 consultation and compliance may include preparation of biological assessments, engagement in formal consultation, and obtainment of biological opinions (including incidental take statements); or requests for incidental take statements or non-jeopardy determinations from the USFWS and/or NMFS, as necessary. (See Appendix II, Endangered Species Act Correspondence, of the Tier 1 Final EIS for more information.)

6.3.2 Section 106 of the National Historic Preservation Act

The FRA determined the NEC FUTURE proposed action is an undertaking with the potential to affect historic properties. This determination is based on the FRA's role in sponsoring and funding the development of the NEC FUTURE investment program and the likelihood that decisions made by the FRA as part of NEC FUTURE will be used to guide future federal funding decisions for projects on the NEC over a period of many years. Therefore, the FRA conducted a Section 106 consultation process concurrently with the NEPA process.

As part of the Section 106 compliance for NEC FUTURE, the FRA worked with State Historic Preservation Offices, Advisory Council on Historic Preservation, the FTA, federally recognized tribes, and other consulting parties to develop a Programmatic Agreement. The Programmatic Agreement establishes the process that will be followed for Section 106 compliance during the environmental review process for Tier 2 project studies. It addresses items such as applicability to Tier 2 actions, government-to-government consultations, identification of consulting parties, and roles and responsibilities. Section XVI of the Programmatic Agreement presents the administrative stipulations for review processes, dispute resolution, amendment, termination, withdrawal, and duration. (The Programmatic Agreement is included in the Tier 1 Final EIS, Appendix GG.)

Within the Programmatic Agreement, the FRA developed state-specific appendices in coordination with each state to identify state-specific processes and requirements to be undertaken during Tier 2 consultations. Any amendments to state-specific appendices require signature by the FRA, Advisory Council on Historic Preservation, the State Historic Preservation Office from the applicable state, and FTA.

6.3.3 Section 4(f) of the U.S. Department of Transportation Act

The FRA did not make a Section 4(f) determination of uses as part of the Tier 1 EIS process. The Tier 1 EIS identified Section 4(f) resources that could be used under Section 4(f) based on representative routing and service assumptions. The identification of a Section 4(f) resource in the Tier 1 EIS does not necessarily mean that resource will be used. The FRA's intent during Tier 1 was to identify potential uses of known Section 4(f) resources and to ensure opportunities to avoid and minimize harm to those resources at subsequent stages in the development process have not been precluded by decisions made at the Tier 1 stage. The information contained in the analysis presented in the Tier 1 will inform Tier 2 evaluations, including the evaluation of possible avoidance alternatives.

Future Tier 2 project sponsors will complete Section 4(f) evaluations and determinations during Tier 2 NEPA analyses for any Tier 2 projects requiring approval of a U.S. DOT agency.

6.4 TIER 2 AGENCY AND PUBLIC COORDINATION

The FRA undertook a robust agency and public involvement and coordination effort for NEC FUTURE. This outreach established a strong foundation for continued coordination in subsequent phases of project development. Through feedback on the Tier 1 Final EIS, agencies, stakeholders and the public indicated their desire to remain involved in the development of Tier 2 project studies. As part of the development of Tier 2 project studies, project sponsors and lead federal agencies could use the communication and coordination efforts established through NEC FUTURE as a starting point.

The FRA will share with future Tier 2 project sponsors copies of agency, stakeholder, and public email and distribution lists collected for NEC FUTURE upon request. This will ensure the continued involvement of interested parties. Opportunities for others to be engaged will continue throughout various phases of project development by project sponsors and lead federal agencies.

6.4.1 Resource and Regulatory Agencies

A unique element of the NEC FUTURE agency involvement process was the early engagement of environmental agencies through a special partnership with the CEQ. This early coordination set the stage for ongoing coordination among resource and regulatory agencies throughout the Tier 1 EIS process. Through this effort and continued regular coordination with resource agencies, the FRA obtained valuable input from resources agencies that helped to shape the Tier 1 EIS and facilitate reviews.

Resource and regulatory agencies have reviewed the analysis in this Tier 1 EIS through the robust NEC FUTURE agency coordination effort; such coordination will also be helpful since a Tier 2 project sponsor—instead of starting a new discussion about an area of concern or issue—can continue the earlier discussion initiated as part of NEC FUTURE.

As planning progresses for subsequent Tier 2 project studies, the FRA recommends early engagement with applicable resource and regulatory agencies. Through early engagement, agencies can help scope the effort required to meet resource and regulatory requirements and facilitate better planning and design that could avoid or minimize impacts to resources. In addition, ongoing coordination with federal resource and regulatory agencies ensures that the corridor-wide perspective is incorporated into project-specific environmental and regulatory reviews.

6.4.2 Public Involvement

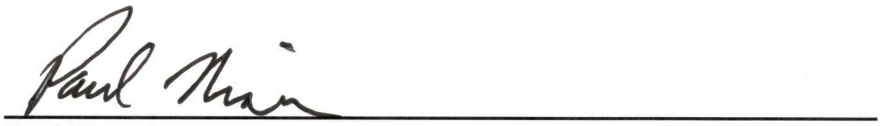
Public feedback has been instrumental in defining the range of alternatives and issues considered throughout the Tier 1 EIS process and will continue to be important through Tier 2 project studies. For each Tier 2 project study, public outreach plans will be developed to guide public participation and dissemination of information by project sponsors in coordination with the lead federal agency as required by NEPA. Public outreach may include developing a project website, regular project updates through social media and email blasts, public open house meetings, community events, targeted outreach to Environmental Justice populations, advisory groups, charrettes, and public hearings.

7. Conclusion

The FRA has reached a decision based on the information contained in the Tier 1 Draft EIS and Final EIS, U.S. DOT and FRA policy objectives, and input received from stakeholders and the public. The FRA approves the Selected Alternative identified in this ROD. The FRA selects this alternative because it best responds to feedback received from stakeholders and the public by the following:

- Establishing corridor-wide performance and service objectives from Washington, D.C., to Boston, MA, for frequency, travel time, design speed, and passenger convenience.
- Committing to corridor-wide modernization through repair, replacement, and rehabilitation of the existing NEC infrastructure to bring it to a state of good repair and increase reliability.
- Approving additional infrastructure between Washington, D.C., and New Haven, CT, and between Providence, RI, and Boston, MA, as needed to implement the Selected Alternative, including investments that add capacity, increase speeds, and eliminate chokepoints.
- Requiring a capacity planning study in Connecticut and Rhode Island to identify on- and off-corridor infrastructure as needed to achieve the Selected Alternative's service and performance objectives.

Furthermore, the Selected Alternative minimizes impacts to the built and natural environment by utilizing existing transportation corridors where practicable and incorporating other mitigation measures that will be defined in further detail in Tier 2 analyses. Accordingly, this alternative has been selected based on processes in compliance with NEPA and other applicable requirements, and, therefore, may be advanced.



7/12/17

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