



TIER 1 FINAL ENVIRONMENTAL IMPACT STATEMENT
VOLUME 1 (PREFERRED ALTERNATIVE)

8. Construction Effects

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8. Construction Effects

8.1 INTRODUCTION

This chapter describes the potential construction types and sequencing that would likely be required for implementing the Preferred Alternative. This chapter also presents a qualitative description of potential construction-related effects on each of the resource areas evaluated in this Tier 1 Final Environmental Impact Statement (Tier 1 Final EIS).

The Preferred Alternative proposes improvements to the Existing Northeast Corridor (NEC) + Hartford/Springfield Line and construction of significant new rail infrastructure—tunnels, bridges, embankments, new stations and ancillary roads and support facilities—occurring through phases and over a period of time. While this chapter describes potential construction-related effects of the Preferred Alternative, it is not intended to describe the precise construction methods that would ultimately be used or to dictate or confine the construction process. Actual construction staging areas, construction methods, construction types, and materials would vary, depending on how Tier 2 projects are designed. The Federal Railroad Administration (FRA) expects Tier 2 project sponsors to plan construction to be the most cost effective within the guidelines of the relevant oversight and funding entities, and within the requirements set forth in bid, contract, and construction documents. In addition, Tier 2 project studies will assess and document project-specific construction activities and their impact, as well as establish project permitting requirements and mitigation measures.

8.2 CONSTRUCTION OVERVIEW

8.2.1 Construction Types

The FRA did not develop detailed project design and construction information for the Preferred Alternative or any alternative analyzed in the Tier 1 EIS. Rather, the FRA developed potential construction types based on available conceptual information for the Preferred Alternative. Six construction types comprise the infrastructure associated with all of the new track construction (NTC): tunnel, trench, at-grade, embankment, aerial structure (bridges and viaducts), and major bridge. During Tier 2 project studies, construction types could change to better reflect site conditions or to minimize effects on resources. Volume 2, Chapter 8, provides more information on the construction types for the Action Alternatives that would similarly apply to the Preferred Alternative.

The FRA considered existing NEC construction features, as well as land use, topographic and other environmental features, and cost in developing the construction types. Construction types do not reflect field investigations or subsurface testing. The design and configuration of the structures of the construction types would vary depending on the site-specific conditions. For example, support structures for aerial structure and major bridge construction type could be designed to be supported on centered footings or as a span over obstacles such as roadways, depending on surface conditions and vertical clearance requirements. Such decisions will be made as part of subsequent Tier 2 project studies as described in Section 8.9.

This Tier 1 Final EIS does not identify locations where specific land clearance methods, such as blasting, drilling, or cut-and-fill would occur. Project sponsors leading subsequent Tier 2 project studies will complete more-detailed engineering and geotechnical testing to finalize construction types and define depths and methodologies for building tunnels or other proposed infrastructure. Furthermore, the Preferred Alternative affords an opportunity to build and design new or modified rail assets in such a way that adaptation measures are included to reduce the effects of climate change, such as flooding.

This section includes a general description of the potential construction types for the Preferred Alternative. Figure 8-1 describes the percentage of construction types by route distance for the existing NEC and the Preferred Alternative for both existing track and new track. Volume 2, Chapter 8, characterizes each of the construction types defined for the NTC incorporated into the Preferred Alternative. Chapter 4, Preferred Alternative, describes the construction types of the new infrastructure of the Preferred Alternative by state. Appendix BB, Technical Analysis on the Preferred Alternative, provides more information about the route distance of track associated with the Preferred Alternative.

8.2.2 Construction Impacts on Train Operations

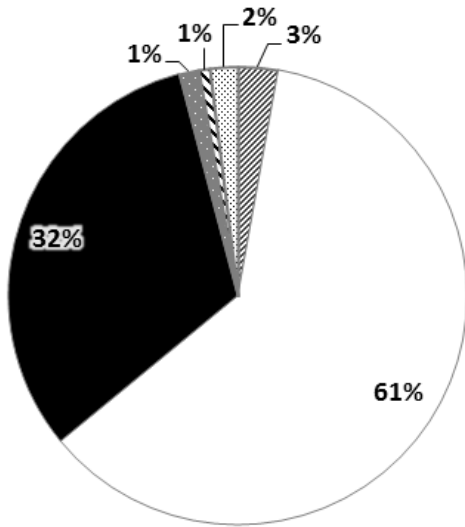
Implementation of dozens of infrastructure projects along an active rail corridor already operating at capacity will present severe challenges for a region that depends on reliable Intercity and Regional train service. Not only would construction of individual projects be staged to minimize disruption to ongoing train operations, but the schedule for implementing multiple simultaneous projects across the NEC would be highly coordinated and integrated to provide required construction outages and resources (both materials and workers) where and when needed.

The work required for some improvements as part of the Preferred Alternative would be undertaken sufficiently away from the existing tracks to minimize impacts to ongoing train operations. These upgrades would include new rail segments that would be constructed off the existing NEC right-of-way as described in Chapter 4, Preferred Alternative, including from Bayview MD, to Newport, DE; New Rochelle, NY, to Greens Farms, CT; and Old Saybrook, CT, to Kenyon, RI. Construction off the existing NEC would provide some opportunity to minimize impacts on existing Intercity operations since once new rail line is completed, some operations on the existing line would be shifted to the new route, freeing up the existing line for necessary construction activities.

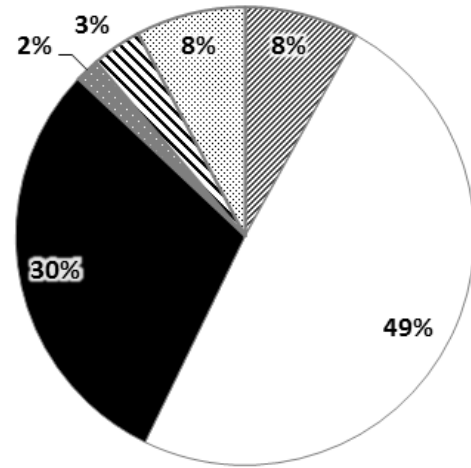
However, Regional train service would remain on the existing NEC while the existing NEC is improved in order to serve existing stations. Several new track and chokepoint relief projects would include new bridges and tunnels and new rail segments that would be constructed along (or over) the existing NEC. These improvements would be designed specifically to minimize disruption to ongoing train operations. While construction off the existing NEC may reduce some costs associated with staging of construction to minimize disruption to ongoing train operations, these savings would be limited since train service would continue to operate on the existing NEC and the Hartford/Springfield Line.

**Figure 8-1: Percentage of Route Miles by Construction Type
(Existing NEC + Hartford/Springfield Line and Preferred Alternative)**

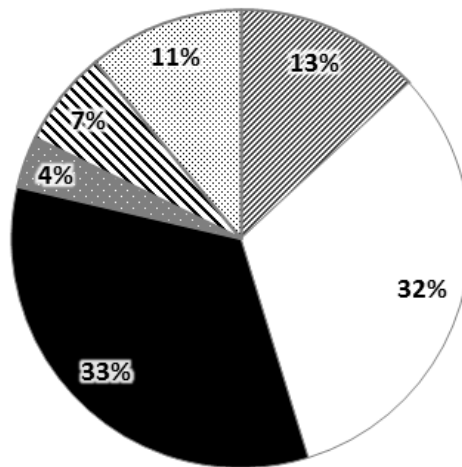
Existing NEC + Hartford/Springfield Line



Preferred Alternative



**Preferred Alternative
(New Track Construction Only)**



- ▨ AERIAL
- AT GRADE
- EMBANKMENT
- MAJOR BRIDGE
- ▨ TRENCH
- ▨ TUNNEL

Source: NEC FUTURE team, 2016

Construction effects associated with the Preferred Alternative would include impacts to freight-rail operations where the Preferred Alternative Representative Route is adjacent to rights-of-way owned/operated by the freight railroads. As described in Chapter 4, the Preferred Alternative is adjacent to existing freight railroad rights-of-way in the following locations:

- ▶ The Bayview, MD, to Newport, DE, new segment is adjacent to sections of CSX Transportation freight-rail right-of-way in Baltimore City, and Baltimore, Harford, and Cecil Counties, MD.
- ▶ The Wilmington, DE, new segment is adjacent to sections of Norfolk Southern freight-rail right-of-way in New Castle County.
- ▶ New infrastructure between Baldwin, PA, and Philadelphia 30th Street Station via Philadelphia International Airport is adjacent to sections of CSX Transportation freight-rail right-of-way in Delaware and Philadelphia Counties.

Although the Preferred Alternative is adjacent to these private freight rights-of-way, the Preferred Alternative would not use these private rights-of-way for passenger rail operations. Construction effects associated with the Preferred Alternative would include lengthened freight-rail travel times and, in turn, increased costs to freight-rail operators caused by reduced operating speeds through the construction zones.

Minimizing construction impacts on ongoing rail operations would be best planned and achieved by packaging projects into multiple phases. Through such phases, individual projects would be timed to meet a number of important objectives. These would include optimizing the benefits across the NEC of complementary capacity and travel-time projects, balancing the demand on resources, and spacing projects to take advantage of construction outages and to minimize adverse impacts on ongoing train operations. The Service Development Plan will include a full phasing plan for the selected alternative that seeks to achieve these benefits.

Volume 2, Chapter 8, provides more information on the potential construction impacts on train operations for the Action Alternatives that would similarly apply to the Preferred Alternative.

8.3 STATION CONSTRUCTION

Some of the new stations would be constructed where the Preferred Alternative involves new right-of-way off the existing NEC, such as the Philadelphia Airport, PA, and the Mystic/New London H.S., CT, stations. In other cases, however, new stations would be added along the existing NEC, such as Bayview, MD, North Brunswick, NJ, and Co-op City, NY, stations. New stations on new right-of-way would be constructed concurrently with NTC, while new stations along the existing NEC would be completed in several phases of construction to maintain train service. These phases could involve construction of temporary run-around tracks while station platforms are expanded or modified. Once the modifications are completed, train service would be shifted back to the original track alignment. Construction of below-ground stations would typically employ open cut-and-cover construction, depending upon the depth of construction. While tunnel boring machines are assumed for construction of tunnels, cut-and-cover construction is used for below-ground stations

because of the extent of station spaces. Where the track is at-grade, on embankment, or aerial structure, stations would be constructed to match the track elevation.

8.4 CONSTRUCTION EQUIPMENT

The Preferred Alternative would most likely use conventional construction techniques and equipment currently used in the Northeast and throughout the United States. Volume 2, Chapter 8, provides more information on the likely construction equipment and techniques for the Action Alternatives that would similarly apply to the Preferred Alternative.

8.5 TYPICAL CONSTRUCTION SEQUENCING

Typical construction sequencing for the Preferred Alternative includes activities related to pre-construction survey, site preparation activities, heavy construction, medium construction, light construction, and pre-revenue service activities. The FRA has not completed any fieldwork associated with pre-construction survey activities. These tasks will be completed as part of subsequent Tier 2 project studies (see Section 8.9, Subsequent Tier 2 Analysis). Volume 2, Chapter 8, provides more information on the typical construction sequencing and key tasks for the Action Alternatives that would similarly apply to the Preferred Alternative.

8.6 CONSTRUCTION STAGING AREAS

Construction of the Preferred Alternative would require construction staging areas, also referred to as “laydown areas.” These are areas and sites used to store materials and equipment, and to assemble construction materials. Work zones are those areas where the construction is occurring. Field offices for contractors and construction managers are usually situated in temporary job-site trailers at staging areas or existing office space near the work areas.

Construction staging/laydown in urban areas, where space is limited, is often located within the street right-of-way as permitted by local transportation departments. In suburban or rural areas, construction/laydown areas are typically included in the right-of-way property requirements for the project. The specific location of construction staging/laydown areas will be identified in subsequent development of Tier 2 project studies. Volume 2, Chapter 8, provides more information on the construction of staging areas for the Action Alternatives that would similarly apply to the Preferred Alternative.

8.7 TEMPORARY CONSTRUCTION EFFECTS

Construction effects associated with the Preferred Alternative would likely be short term, depending on the duration of construction activities. The areas that would be most affected by construction activities would generally comprise the area immediately bordering the construction activities. However, in some cases, effects from construction activities could extend beyond the immediate area surrounding construction sites (e.g., dust carried by wind, or noise propagated over distances). Volume 2, Chapter 8, provides more information on the potential temporary effects

from construction activities for the Action Alternatives that would similarly apply to the Preferred Alternative.

8.8 POTENTIAL MITIGATION

Construction of the Preferred Alternative could generate impacts to the natural and built environment. During Tier 2 project analysis, project sponsors will be required to develop project-specific measures to reduce and/or mitigate construction impacts. Examples of mitigation measures that could be employed include the following:

- ▶ Schedule construction activities that require lane or roadway closures during off-peak hours, where practicable.
- ▶ Coordinate freight schedules and construction activities with railroads.
- ▶ Locate staging areas on sites designated for permanent project use, such as parking lots and yard and maintenance facilities.
- ▶ Maintain access to businesses during construction for customers and deliveries.
- ▶ Comply with applicable federal, state, and local regulations regarding mitigation measures of diesel emissions.
- ▶ Minimize disturbed areas and employ an Erosion and Sediment Control Plan to treat stormwater runoff.
- ▶ Prevent the storage of fill and other materials in floodplains, to the extent practicable.
- ▶ Adhere to Construction Protection Plans for cultural resources and historic properties.

Volume 2, Chapter 8, provides more information on the potential mitigation measures for construction effects for the Action Alternatives that would similarly apply to the Preferred Alternative.

8.9 SUBSEQUENT TIER 2 ANALYSIS

Subsequent planning and environmental compliance processes associated with Tier 2 projects will assess temporary construction-related effects to the natural and built environment. Tier 2 project analysis will be based upon site-specific design and construction methods, as well as construction scheduling and sequencing. Project sponsors leading subsequent Tier 2 project studies will complete more-detailed sequence of construction activities and specific construction-related project tasks. Tier 2 project analysis will include field investigations, subsurface testing, and require project-specific measures to reduce and/or mitigate construction impacts. Consultation with regulatory agencies regarding temporary construction effects and development of agreed-upon permit requirements and conditions will also be undertaken during Tier 2 evaluations.