7.1 Summary of Findings

7.1 SUMMARY OF FINDINGS

7.1.1 Introduction

This section provides an overview of the Environmental Consequences and benefits documented in Chapters 7.2–7.21. It also includes an overview of the effects and benefits identified in Chapter 5, Transportation, and Chapter 6, Economic Effects and Growth, and Indirect Effects, since the findings in these chapters also influence the analyses conducted for some of the resources presented in Chapter 7. Appendix E provides detailed information for each Action Alternative, by state and by county. Appendix A, Mapping Atlas, provides a visual overview of where resources are located in relation to the existing Northeast Corridor (NEC) and Action Alternatives. Appendix A also provides mapping that shows the Representative Route of each Action Alternative.

7.1.2 Summary of Findings

In general, impacts on environmental resources would be greatest in areas where the Action Alternatives go off of the existing NEC into less developed areas in a new right-of-way. However, some impacts do exist on resources located along and within the existing NEC right-of-way. This Tier 1 Draft Environmental Impact Statement (Tier 1 Draft EIS) presents a conservative assessment of potential environmental consequences because the analytical approach is based on conceptual engineering and a qualitative level of detail.

7.1.2.1 No Action Alternative

The No Action Alternative represents the Study Area in 2040 regardless of NEC FUTURE. It includes reasonably foreseeable future projects and transportation improvements to highway, freight rail, transit, air, and maritime modes that will occur by 2040 that range in scope and complexity. Most of the projects and activities included as part of the No Action Alternative occur within the existing NEC right-of-way. Under the No Action Alternative, passenger rail service along the NEC operates and provides approximately the same level of service as provided today. As a result, “service-related” effects on noise and vibration are unlikely. However, service-related effects on air quality could result due to increased congestion within the overall transportation network. “Footprint” effects on environmental resources under the No Action Alternative vary, depending on the scope of the project being implemented. Examples of the types of activities occurring under the No Action Alternative include, but are not limited to the following:

- Track rehabilitation
- Major bridge/tunnel repairs and/or rehabilitation
- Signal improvements
- Installation of rail sidings or run-around tracks to maintain train service
- Everyday maintenance of railway activities to keep the railroad in operation
- Station/platform extensions/improvements
- Highway infrastructure improvements

In some cases projects that are part of the No Action Alternative have footprints and effects that extend beyond the existing NEC right-of-way. Those types of projects, depending on the scope and complexity, have a greater potential to affect environmental resources than those activities occurring within the existing NEC right-of-way.

Table 7.1-1 summarizes the likely effects, by resource, for activities occurring under the No Action Alternative. The extent of likely effects are unknown and not quantified as part of this Tier 1 Draft EIS.

While effects resulting from the No Action Alternative are not quantified (see Chapter 7, Introduction, for an explanation of the approach to identifying effects associated with the No Action Alternative), effects are likely to occur to various resources that exist within and adjacent to the existing NEC right-of-way. Benefits resulting from the Action Alternatives, such as increased mobility, accessibility and connectivity would not occur under the No Action Alternative. In some cases, the No Action Alternative would result in adverse effects on some populations, including Environmental Justice communities, because capacity is unmet and does not keep pace with population and employment growth, thereby negatively affecting mobility, accessibility, and connectivity. Furthermore, unmet capacity will require travelers to continue to rely on automobiles, air, and intercity bus for travel in the corridor as they do today. Under the No Action Alternative, transportation congestion would increase due to projected population growth and continued reliance on automobiles. As a result, the increased congestion would result in negative effects on energy consumption and air quality.

Improvements under the No Action Alternative are subject to varying levels of environmental review and permitting (federal, state, local), depending on the activity and funding source(s). The evaluation of resource impacts and required permits associated with those activities are the responsibility of the implementing agency and project sponsor.

7.1.2.2 Action Alternatives

A range of benefits and impacts occur with each of the Action Alternatives since each proposes varying degrees of investment from both a service and infrastructure perspective. As such, benefits and impacts associated with each Action Alternative differ due to the level of service provided and infrastructure proposed.

Each Action Alternative has the potential to change how people travel across the Study Area and reduce the number of non-rail trips as travelers switch to passenger rail service. More passenger rail stations are added, connecting more people to more places. Train services become more frequent providing more flexibility and more options for travelers. Each Action Alternative provides improved capacity, mobility, and connectivity. These transportation benefits result in economic benefits to regions served by the NEC. The additional capacity enables greater accessibility for workers and employers, allows major economies to grow larger and be more productive, and increases development around stations due to travel times savings and greater accessibility with more connections, services to new locations and prices available to travelers. The improved reliability and mobility of service provided contributes to an improved quality of life for people living and working within the region; attracts businesses and employees to the region; and in turn supports economic growth and development.

Table 7.1-1: Summary of Environmental Effects: No Action Alternative

Resource	Environmental/Transportation/Economic Direct Effects*
Transportation (Chapter 5)	§ Unmet demand for rail travel across the corridor; lack of redundancy decreasing reliability of service during maintenance activities or catastrophic events
Economic Effects, Growth, and Indirect Effects (Chapter 6)	§ Current economic and development trends continue
Land Cover (Chapter 7.2)	§ Existing conditions continue
Agricultural Lands (Chapter 7.3)	§ Existing conditions continue
Parklands and Wild and Scenic Rivers (Chapter 7.4)	§ Existing conditions continue
Hydrologic/Water Resources (Chapter 7.5)	§ Dredge/fill of wetlands other Waters of the U.S. § Encroachment of floodplains § Navigable Waterways
Ecological Resources (Chapter 7.6)	§ Fragmentation and displacement of Ecologically Sensitive Habitat (e.g., dredge/fill of wetland) § Temporary disturbances to Essential Fish Habitat § Threatened and Endangered species unlikely to occur within right-of-way; transient species may traverse areas for foraging/shelter
Geologic Resources (Chapter 7.7)	§ Geologic resources may occur within existing right-of-way; extent of effects unknown
Hazardous Waste and Contaminated Materials Sites (Chapter 7.8)	§ Disturbance of hazardous wastes and contaminated materials
Cultural Resources and Historic Properties (Chapter 7.9)	§ Some elements of existing NEC are considered historic, demolition or disturbance of those resources may result in adverse effects
Visual and Aesthetic Resources (Chapter 7.10)	§ Existing conditions continue § New infrastructure may alter visual setting; effects depend on surrounding visual quality
Environmental Justice (EJ) (Chapter 7.11)	§ Existing conditions continue; however, unmet capacity needs likely result in adverse effects on mobility, accessibility and connectivity for communities, including EJ populations
Noise and Vibration (Chapter 7.12)	§ Existing conditions continue
Air Quality (Chapter 7.13)	§ Increased congestion results in degradation of air quality
Energy (Chapter 7.14)	§ Increased congestions, reliance on automobiles results in increases in energy consumption
Climate Change and Adaptation (Chapter 7.15)	§ Effects of climate change on existing NEC infrastructure related to sea level rise and storm surges remain un-mitigated, and will worsen as climate change effects become more severe.
Section 4(f)/6(f) Resources (Chapter 7.16)	§ Existing conditions continue
EMF/EMI (Chapter 7.17)	§ Existing conditions continue
Safety (Chapter 7.18)	§ Improvements will be subject to safety regulations/requirements
Public Health (Chapter 7.19)	§ Existing conditions continue
Cumulative Effects (Chapter 7.20)	§ Resources affected could contribute cumulatively to effects on similar resources within the Study Area

Source: NEC FUTURE team, 2015
*Effects noted are general. If an improvement under the No Action Alternatives requires additional right-of-way, effects may occur to a greater degree for any resource.

Under the Action Alternatives, modeling predicts a decrease in regional pollutant burdens and greenhouse gases (GHG) (in terms of carbon dioxide equivalent) from roadways caused by the expected decrease in roadway vehicle-miles traveled (VMT). Likewise, there would be an increase in regional pollutant burdens and GHGs from power sources (diesel fuel and electric) because of increased train service under the Action Alternatives. The combined effect of these changes is predicted to be a reduction in emissions of all criteria pollutant burdens, with the exception of nitrogen oxides (NO_x) under Alternative 3 and sulfur dioxide (SO_2), under all Action Alternatives. GHG emissions would decrease under all Action Alternatives in the year 2040 due to predicted shifts in mode choice as a result of implementing any of the Action Alternatives and predicted changes in renewable energy usage.

Changes in criteria pollutants and GHGs due to bus and aircraft travel would decrease under all Action Alternatives because of the expected mode shift from aircraft and bus travel to passenger rail. Construction would result in temporary emissions of criteria pollutants and GHGs associated with construction equipment and activities.

In terms of energy usage, modeling predicts the Action Alternatives result in a decrease in energy use from roadways caused by the expected decrease in roadway VMT. Likewise, there would be an increase in energy use from power sources (e.g. diesel fuel and electric) because of increased train service under the Action Alternatives. The combined effect of these elements is predicted to reduce total energy use under all alternatives, with Alternative 3 showing the greatest decrease in energy use from the reductions in roadway VMT.

Energy use associated with bus and aircraft travel decreases under all Action Alternatives due to the mode shift from aircraft and bus travel to passenger rail. Construction of the Action Alternatives would result in non-recoverable uses of energy associated with construction equipment and activities.

Another benefit of the additional capacity, mobility, and connectivity associated with the Action Alternatives is improved access to Environmental Justice (EJ) communities along the NEC. Increased train frequencies, more connections, new locations and pricing available to travelers would provide more choices enabling people to have a greater selection and availability of jobs and services.

From a public health perspective, these improvements to air quality, energy use, and community access add up to an overall better quality of life for persons living and commuting throughout the Study Area. The temporary effects of future construction activities vary depending on the construction methods used. For example, construction activities may result in increased fugitive dust emissions, noise and vibration or light pollution that could have temporary effects on the human and natural environment. However, appropriate best management practices and mitigation measures would be employed to reduce the effects of construction.

Each Action Alternative has the potential to contribute to cumulative effects on various resources. Cumulative benefits generally include an overall improved transportation network, improved opportunities for economic development, reductions in regional pollutant burdens, increased resiliency, focused development around station areas that may limit sprawl in some areas, and benefits to EJ communities. The Action Alternatives offer benefits to freight movement by easing

select chokepoints in the corridor. Cumulative impacts related to physical improvements associated with each of the Action Alternatives include contributing to dredge and fill of wetlands, habitat fragmentation, loss of forested areas, conversion of land cover from non-transportation to transportation uses, and potential effects on cultural resources and historic properties.

Table 7.1-2 provides a summary and comparison of the quantitative environmental effects identified for each of the Action Alternatives. The table identifies that total quantities of a resource potentially affected for each Action Alternative. It also shows the quantities of a resource associated with the existing NEC for context since each of these Action Alternatives includes improvements to the existing NEC. This table also presents the information for each Action Alternative between Washington, D.C., and New York City, and New York City and Boston. It does not include transportation, economic effects, air quality, energy, public health, construction, or cumulative effects since the FRA qualitatively described those effects above.

Each of the Action Alternatives also includes various improvements such as curve modifications, new segments, new track, junctions, and station areas. Generally, those improvements that are concentrated on the existing NEC, such as new track, junctions, and minor curve modifications would have similar footprint-related effects as described for the No Action Alternative in Table 7.1-1. As such, these effects do not necessarily help to differentiate the alternatives because these types of improvements would be similar across all alternatives. However, where the Action Alternatives include new segments or new stations off of the existing NEC in a new right-of-way, there would be different effects to footprint-related environmental resources, which would help to differentiate the Action Alternatives. (Chapter 4, Alternatives Considered, and Appendix A, Mapping Atlas, provide the locations of these new segments and stations.) The discussion that follows seeks to highlight the differences among the Action Alternatives, in terms of environmental impacts, by focusing on effects of new segments and new station locations for each Action Alternative since the greatest potential for effects are likely associated with those types of improvements.

Table 7.1-2: Summary of Effects (totals)

Resource	Environmental Consequences							
	Washington, D.C. to New York City				New York City to Boston			
	Existing NEC	Alt. 1	Alt. 2	Alt. 3	Existing NEC	Alt. 1	Alt. 2	Alt. 3
Land Cover - Potential Conversion - Developed (acres)	3,510	3,510	3,985	8,175	2,965	3,365	4,485	4,215–6,005
Land Cover - Potential Conversion - Undeveloped (acres)	405	415	610	1,675	1,085	1,390	2,010	1,525–2,440
Land Cover – Potential Acquisitions - Developed (Existing NEC removed from Alts) (acres)*	—	65	900	3,995	—	520	1,760	1,880–4,360
Land Cover – Potential Acquisitions - Undeveloped (Existing NEC removed from Alts) (acres)*	—	5	245	1,215	—	400	1,245	890–2,110
Prime Farmland (acres)	75	75	140	395	145	205	290	270–415
Prime Timberland (acres)	325	325	480	1,290	860	1,265	2,020	1,695–2,895
Parklands (acres)	45	45	95	295	390	480	525	470–605
Wild & Scenic Rivers (acres)	1	1	1	2	0	0	0	0
Freshwater Wetlands (acres)	90	90	150	545	140	195	310	185–425
Floodplains (acres)	450	455	680	1420	610	680	840	805–850
Saltwater Wetlands (acres)	55	75	100	190	145	180	195	205–570
Coastal Zone (route miles)	55	55	70	115	130	170	160	160–185
ESH Terrestrial (acres)	320	320	510	1,530	650	990	1,700	1,810–2,590
ESH Aquatic Freshwater (acres)	25	25	40	110	20	35	55	70–100
ESH Aquatic Saltwater (acres)	55	70	100	185	145	180	200	205–570
T&E (# species in AE)	20	20	20	20	15	20	15	15–24
EFH (# species)	10	10	10	10	35	35	40	35–40
EFH (# crossings)	5	10	10	10	30	35	40	35–40

Note: Effects shown represent the areas/number of a given resource identified within the Representative Route unless otherwise noted to be associated with the Affected Environment (AE).

* Acquisitions could result in future displacements; those displacements would be quantified only as part of a Tier 2 studies.

ESH = Ecologically Sensitive Habitat; T&E = Threatened and Endangered Species; EFH = Essential Fish Habitat

Table 7.1-2: Summary of Effects (totals) (continued)

Resource	Environmental Consequences							
	Washington, D.C. to New York City				New York City to Boston			
	Existing NEC	Alt. 1	Alt. 2	Alt. 3	Existing NEC	Alt. 1	Alt. 2	Alt. 3
Seismic Hazards (presence # counties)	7	7	7	7	8	8	9	10–13
Sole Source Aquifers (presence # counties)	6	6	6	6	5	5	6	6–8
Karst Terrain (presence # counties)	0	0	0	1	0	0	0	0
Naturally Occurring Asbestos (presence # counties)	0	0	0	0	0	0	0	0
Acid Producing Soils (presence # counties)	13	13	13	13	1	1	1	1–4
Landslide Susceptibility (presence # counties)	4	4	4	4	0	0	1	1–2
Mineral Resources - Producer (#)	0	0	0	1	0	0	0	0–1
Mineral Resources - Occurrence (#)	0	0	0	1	0	0	0	0
Mineral Resources - Plant (#)	2	2	2	8	0	0	1	1
Mineral Resources - Inactive Producer (#)	0	0	1	2	2	2	4	2–4
Active Mines (#)	0	0	0	0	0	0	0	0
NPL Superfund (# sites)	0	0	0	0	0	0	0	0–1
Brownfields (# sites)	20	20	25	60	4	5	10	5–10
RCRA CORRACTS (# sites)	0	0	0	0	1	1	1	1
RCRA Info (# sites)	2	2	4	15	5	5	10	15–20
RCRA TSDF (# sites)	0	0	0	1	3	3	3	3
State (# sites)	25	25	40	85	30	35	50	50–75

Note: Effects shown represent the areas/number of a given resource identified within the Representative Route unless otherwise noted to be associated with the Affected Environment (AE).
NPL Superfund = National Priority List
RCRA CORRACTS = Resource Conservation and Recovery Act Corrective Actions
RCRA Info = Resource Conservation and Recovery Act Information Systems
RCRA TSDF = Resource Conservation and Recovery Act Treatment, Storage, and Disposal Facilities
State = State Databases

Table 7.1-2: Summary of Effects (totals) (continued)

Resource	Environmental Consequences							
	Washington, D.C. to New York City				New York City to Boston			
	Existing NEC	Alt. 1	Alt. 2	Alt. 3	Existing NEC	Alt. 1	Alt. 2	Alt. 3
NHL (#)	1	2	3	3	0	0	0	0–1
NRHP (#)	10	45	45	50	20	95	125	75–110
Total Population (AE)	2,068,324	2,087,480	2,013,836	2,483,362	2,343,994	2,380,100	2,875,380	3,430,234–4,059,222
Minority Population (AE)	1,227,667	1,242,102	1,195,965	1,417,921	1,154,108	1,161,758	1,337,865	1,493,611–1,939,703
Low Income Population (AE)	366,825	370,292	350,335	438,378	356,038	357,307	414,835	455,386–534,027
Percent Minority (AE)	59%	60%	59%	57%	49%	49%	47%	43%–49%
Percent Low Income (AE)	19%	19%	18%	19%	19%	16%	15%	14%
EJ Tracts (AE)	349	353	342	407	298	299	351	380–519
Noise - severe or moderate (# counties)	N/A	16	16	16	N/A	14	15	20
Vibration Impact (# counties)	N/A	1	5	9	N/A	2	8	19
Climate Change - Total Area at Risk of Inundation (Acres)/% of total Representative Routes)								
Sea Level Rise (Current Climate Conditions)	45/< 1%	50/<1%	105/<1%	180/1%	50/<1%	90/1%	90/<1%	90–115/<1%
Storm Surge (Current Climate Conditions)	210/< 1%	230/3%	460/4%	875/5%	470/7%	530/7%	550/5%	560–620/3%–4%
Riverine (Current Climate Conditions)	460/ <1%	475/7%	755/7%	1,665/10%	650/10%	730/10%	940/9%	1,030–1,060/6%–7%
Section 6(f) (acres)	15	15	25	170	35	45	70	65–75

Note: Effects shown represent the areas/number of a given resource identified within the Representative Route unless otherwise noted to be associated with the Affected Environment (AE).
NHL = National Historic Landmark
NRHP = National Register of Historic Places
AE = Affected Environment
EJ = Environmental Justice

7.1.2.3 Alternative 1

Alternative 1 provides improvements focused on the existing NEC that result in greater capacity, thus benefitting the transportation network as a whole along the entirety of the existing NEC. The total number of rail passenger trips increases by approximately 16 percent under Alternative 1 over the No Action.

Many of the improvements associated with Alternative 1 would have similar types of effects as described for the No Action Alternative. However, Alternative 1 proposes four new segments parallel to and outside of the existing NEC right-of-way. Table 7.1-3 summarizes the effects associated with those improvements. (Appendix E provides additional detail on all effects by state and county identified for Alternative 1 under the various resource sections.)

Connecticut and Rhode Island would bear the greatest negative environmental effects under Alternative 1. This is due to the Stamford and Old Saybrook-Kenyon segments. The Old Saybrook-Kenyon segment is approximately 50 miles in length and traverses New London County, CT, and Washington County, RI. Improvements along this segment would result in notable effects, including impacts to numerous water resources, ecological resources, prime farmland soils, and prime timberlands; additionally, these effects would occur in the coastal area, which could be inconsistent with policies that support adherence to the Coastal Zone Management Act. More than 250 acres of floodplain impacts and more than 60 acres of saltwater wetland impacts would occur in New London County. New London County has the greatest potential for acquisitions and displacements. Approximately 60 acres of freshwater wetland impacts would occur in Washington County, RI. The climate change analysis indicates that both New London and Washington Counties are subject to increased risk of inundation for the near-term (mid-century) climate conditions. New London County in particular is subject to an increased risk of sea level rise flooding, coastal storm surge flooding and riverine flooding. Washington County, RI, is primarily at risk for riverine flooding. However, when compared to the equivalent portion of the existing NEC, the Old Saybrook-Kenyon segment provides for redundancy and adds resiliency benefits from risks associated with coastal storm surge and riverine flooding.

The Stamford segment also occurs in Connecticut. This segment is considerably shorter than the Old Saybrook-Kenyon segment and is primarily located in Fairfield County. Fairfield County has concentrations of water and ecological resources. Fairfield County also has a high potential for acquisitions and displacements. Of particular note is that Fairfield County has Environmental Justice (EJ) populations. Finally, this segment is in an area faced with a risk of inundation for the near-term (mid-century) climate scenario for sea level rise, coastal storm surge, and riverine flooding.

7.1.2.4 Alternative 2

Alternative 2 provides improvements focused on the existing NEC that result in greater capacity and also provides a new inland corridor in CT between New Haven and Providence via Hartford. The total number of passenger rail trips increases by approximately 21 percent over the No Action Alternative.

Alternative 2 includes 11 new segments, parallel to and outside of the existing NEC right-of-way. Table 7.1-3 summarizes the effects. These segments are dispersed throughout and closely aligned to

the existing NEC with the exception of the New Haven-Hartford-Providence segment. This segment goes through areas that are much less developed and rural. While development exists around New Haven, Hartford, and Providence, in between these cities are stretches of undeveloped land. As such, effects on environmental resources would be high throughout the counties of Fairfield, New Haven, Hartford, Tolland, and Windham Counties, CT, and Providence, RI. Of particular concern are high acreages of impacts to prime timberlands in Tolland and Windham Counties, CT, and Washington and Providence Counties, RI. Combined, more than 1,000 acres of prime timberland would be affected in these counties. New London, New Haven, and Hartford Counties, CT, would have more than 500 acres of floodplain affected by the New Haven-Hartford-Providence segment. However, when compared to the equivalent portion of the existing NEC, this new segment provides for redundancy and adds resiliency benefits from risks associated with coastal storm surge and riverine flooding.

Alternative 2 would result in high acreages of prime farmland and timberland impacts along a new segment in Cecil County, MD, and along the existing NEC in New London County, CT, and Washington County, RI. Alternative 2 would also result in acquisitions and potential displacements. The greatest acreage of possible acquisitions for Alternative 2 would occur in Fairfield, New Haven, and Hartford Counties, CT—all of which are noted to have EJ populations. Alternative 2 is the only Action Alternative to bisect the John Heinz National Wildlife Refuge in Delaware and Philadelphia, PA, which is ecologically sensitive and located within a coastal zone.

7.1.2.5 Alternative 3

Alternative 3 provides improvements focused on the existing NEC that result in greater capacity and provides a new second spine between Washington, D.C., and Boston. The second spine generally runs parallel to the existing NEC between Washington, D.C., and New York City; however, north of New York City variations in routing exist for the second spine. These variations, or route options, reach new markets such as Hartford, CT, Long Island, NY, and Worcester, MA. The new markets create greater potential for induced growth indicated by the station area development. The potential economic-related construction effect is highest with Alternative 3 with 3,534,160 construction jobs (average across route options), providing a one-time stimulus to the economy. With any of the variations of Alternative 3, there are approximately 32 percent more total passenger rail trips over the No Action Alternative. Alternative 3 provides excess capacity at all locations along the corridor to accommodate additional off-corridor trips and future growth post 2040. The second spine increases redundancy and resiliency compared to the existing NEC with a lower percentage of the Representative Route at risk from riverine and storm surge flooding.

However, Alternative 3 has the greatest impact to Ecologically Sensitive Habitat (ESH), with Maryland, Connecticut, and Massachusetts each containing 29 individual areas affected.

The effects of Alternative 3 are presented in segments as follows: Washington, D.C., to New York City; New York City to Hartford; and Hartford to Boston. Tables 7.1-5 through 7.1-9 summarize the effects for each section of Alternative 3.

Washington, D.C., to New York City

To complete a second spine, additional right-of-way would be required. Between Washington, D.C., and New York City, acquisitions and displacements would be greatest in Baltimore County, Baltimore City, and Harford County, MD; New Castle County, DE; Philadelphia and Bucks County, PA; and Middlesex County, NJ. All of these counties are noted as having EJ populations. Anne Arundel and Harford Counties, MD, would have more than 300 acres of floodplain effects. New Castle, DE, would have more than 200 acres of floodplain effects. Middlesex and Hudson Counties, NJ, would have more than 250 acres of affected floodplain, and Hudson County would have more than 100 acres of saltwater wetlands that would be affected. Cecil County, MD, would have high acreages of both prime farmland soils and prime timberlands affected and Middlesex County would also have high acreages of prime farmland affected. New Castle, DE, would also have a high acreage of prime timberlands affected.

New York City to Hartford

Via Central Connecticut

Westchester, NY, and New Haven and New London, CT, combined would have more than 650 acres of impact to prime timberlands. The greatest acreage of potential acquisitions would occur in Fairfield, CT. This route option would have considerably fewer impacts to water resources than the Long Island route option particularly with regards to wetlands. New London County would have more than 230 acres of floodplain affected. High concentrations of hazardous waste and contaminated material sites are located in Fairfield, CT.

Via Long Island

More than 500 acres of acquisitions of developed land would occur in Suffolk County, NY, and more than 400 acres of acquisitions of developed land would occur in New Haven, CT. The highest acreages of prime farmland affected would occur in Suffolk County, NY, and New Haven County, CT, as well. In New London, New Haven, and Hartford, CT, there would be almost 600 acres of prime timberland affected. Two Section 6(f) resources could be affected. More than 200 acres of floodplain impact would occur in New London. There is the potential for high ecological resource impact, particularly saltwater ESH, Essential Fish Habitat, and federally listed Threatened and Endangered species in Suffolk County, NY, and the associated Long Island Sound. Saltwater wetland impacts, totaling more than 400 acres, would occur with this route option, with the majority of those impacts occurring in Suffolk County, NY. The impact to wetlands is nearly three times the number of acres of wetlands compared to the Central Connecticut route option and would traverse through 20 percent more route miles of coastal zone.

Hartford to Boston

Via Providence

This route option would have high acreages of prime timberland impacts in almost every county it traverses. Windham, CT; Washington, RI; and Norfolk, MA, would have more than 300 acres each of prime timberland impacts. Along the existing NEC, high acreages of prime farmland and prime timberland affected would occur in Washington County, RI. One National Historic Landmark identified north of New York, the John B. Smith Building adjacent to Fenway Park in Suffolk, MA, would be

affected under this segment of Alternative 3. Two Section 6(f) resources could be converted to non-recreational uses.

This route option would affect 10 percent fewer acres of Special Flood Hazard Areas compared to the Worcester route option; however, there are approximately 35 percent more wetlands and nearly four times as many route miles of coastal zone would be traversed.

Via Worcester

This route option would also encounter high acreages of prime timberland, primarily in Washington, RI, and Worcester, MA, as well as high acreages of prime farmland along the new segment in Worcester County, MA. It would also affect the one National Historic Landmark identified north of New York—the John B. Smith Building adjacent to Fenway Park in Suffolk, MA.

Table 7.1-3: Summary of Environmental Effects for New Segments (Alternative 1)

State	County	New Segment	Land Conversions	Displacement/ Acquisitions	Prime Farmland	Prime Timberland	Parklands	Wild & Scenic Rivers	Floodplains	Freshwater Wetlands	Saltwater Wetlands	Navigable Waterways	Coastal Zone	ESH	EFH	T&E Species	Geologic Resources	HWCM Sites	Cultural Resources (NHLs)	EJ Populations	Noise (Severe/Moderate)	Vibration	Climate Change Inundation Effects Mid Century
MD	Baltimore City	Baltimore Tunnel	X	X	—	—	—	—	X	—	—	X	—	—	X	X	X	—	—	X	X	X	X
NJ	Hudson	Hudson River third and fourth tunnels	—	—	—	—	—	—	X	X	X	X	X	—	X	X	—	—	—	X	X	—	X
NY	New York	Hudson River third and fourth tunnels	—	—	—	—	—	—	X	—	X	X	X	—	X	X	—	—	—	X	X	—	X
CT	Fairfield	Stamford	—	X	X	X	—	—	X	X	X	X	X	X	X	X	—	—	—	X	X	—	X
	New London	Old Saybrook-Kenyon Segment	X	X	X	X	—	—	X	X	X	X	X	—	X	X	X	X	—	—	—	X	X
RI	Washington	Old Saybrook-Kenyon Segment	—	—	X	X	—	—	X	X	—	—	—	X	—	X	—	—	—	—	—	X	X

Source: NEC FUTURE team, 2015
X = Potential for effects identified for new segment under Alternative 1

Table 7.1-4: Summary of Environmental Effects by New Segment (Alternative 2)

State	County	New Segment	Land Conversions	Displacement/Acquisitions	Prime Farmland	Prime Timberland	Parklands	Wild & Scenic Rivers	Floodplains	Freshwater Wetlands	Saltwater Wetlands	Navigable Waterways	Coastal Zone	ESH	EFH	T&E Species	Geologic Resources	HWCM Sites	Cultural Resources (NHLs)	EJ Populations	Noise (Severe/Moderate)	Vibration	Climate Change area of SLR/Storm Surge
MD	Baltimore City	Baltimore Great Circle Tunnel (B&P Tunnel replacement)	X	X	—	X	—	—	X	X	—	X	—	—	X	—	X	—	X	X	X	X	X
	Harford	Perryville to Newark, DE	X	X	X	X	X	—	X	X	X	X	—	X	X	X	X	X	X	X	X	—	X
	Cecil	Perryville to Newark, DE	X	X	X	X	X	—	X	X	—		—	X	—	X	X	—	X	—	X	X	X
DE	New Castle	Perryville to Newark, DE	X	X	X	X	—	—	X	X	X	X	X	X	X	X	X	X	X	—	X	—	X
	New Castle	Wilmington Bypass	X	X	X	X	—	—	X	X	X	X	X	X	X	X	X	X	X	—	X	—	X
PA	Delaware	Baldwin to Philadelphia 30th Street via Philadelphia Int'l Airport	X	X	—	—	X	—	X	X	—	—	X	—	—	X	X	X	X	—	X	X	X
	Philadelphia	Philadelphia 30th Street to Bridgeburg	X	X	—	X	X	—	X	X	—	—	X	—	—	X	X	X	X	X	X	X	X
NJ	Middlesex	North Brunswick to Secaucus	X	X	X	X	X	—	X	X	X	—	—	X	X	X	X	X	X	X	X	X	X

Table 7.1-4: Summary of Environmental Effects by New Segment (Alternative 2) (continued)

State	County	New Segment	Land Conversions	Displacement/Acquisitions	Prime Farmland	Prime Timberland	Parklands	Wild & Scenic Rivers	Floodplains	Freshwater Wetlands	Saltwater Wetlands	Navigable Waterways	Coastal Zone	ESH	EFH	T&E Species	Geologic Resources	HWCM sites	Cultural Resources (NHLs)	EJ Populations	Noise (Severe/Moderate)	Vibration	Climate Change area of SLR/Storm Surge
NJ	Hudson	Hudson River third and fourth tunnels	X	X	—	—	—	—	X	X	X	X	X	—	X	X	X	X	X	X	X	—	X
NY	New York	Hudson River third and fourth tunnels	X	X	—	—	—	—	X	—	X	X	X	—	X	X	X	X	X	X	X	—	X
	Queens	East River 5th and 6th tunnels	X	X	—	—	—	—	X	—	X	X	X	—	X	X	X	X	X	X	X	X	—
	Westchester	New Rochelle to Westport, CT (Green's Farms)	X	X	—	—	—	—	X	X	X	—	X	—	—	X	X	—	X	—	X	X	—
CT	Fairfield	New Rochelle to Westport, CT (Green's Farms)	X	X	—	X	X	—	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Fairfield	New Haven-Hartford-Providence	X	X	—	X	X	—	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	New Haven	New Haven-Hartford-Providence	X	X	X	X	X	—	X	X	X		X	X	X	X	X	X	X	—	X	X	X

Table 7.1-4: Summary of Environmental Effects by New Segment (Alternative 2) (continued)

State	County	New Segment	Land Conversions	Displacement/Acquisitions	Prime Farmland	Prime Timberland	Parklands	Wild & Scenic Rivers	Floodplains	Freshwater Wetlands	Saltwater Wetlands	Navigable Waterways	Coastal Zone	ESH	EFH	T&E Species	Geologic Resources	HWCM Sites	Cultural Resources (NHLs)	EJ Populations	Noise (Severe/Moderate)	Vibration	Climate Change area of SLR/Storm Surge
CT	Hartford	New Haven-Hartford-Providence	X	X	X	X	X	—	X	X	—	X	—	X	X	—	X	X	X	X	X	X	X
	Tolland	New Haven-Hartford-Providence	X	X	X	X	X	—	X	X	—	—	—	X	—	—	X	X	X	—	X	X	—
	Windham	New Haven-Hartford-Providence	X	X	X	X	X	—	x	X	—	—	—	X	—	X	—	—	X	—	X	X	—
RI	Providence	New Haven-Hartford-Providence	X	X	X	X	X	—	X	X	X	X	—	X	X	X	—	—	X	X	X	X	X
MA	Bristol	Sharon, MA to Westwood, MA/Route 128	X	X	X	X	—	—	X	X	—	—	—	X	—	X	—	—	X	_	X	—	X
	Suffolk	Sharon, MA to Westwood, MA/Route 128	X	X	—	—	—	—	X	X	—	—	—	—	—	X	X	—	X	X	X	—	—

Source: NEC FUTURE team, 2015
X = Potential for effects identified for new segment under Alternative 2.

Table 7.1-5: Summary of Environmental Effects by New Segment (Alternative 3 – Washington, D.C., to New York City)

State	County	Land Conversions	Displacement/Acquisitions	Prime Farmland	Prime Timberland	Parklands	Wild & Scenic Rivers	Floodplains	Freshwater Wetlands	Saltwater Wetlands	Navigable Waterways	Coastal Zone	ESH	EFH	T&E Species	Geologic Resources	HWCM Sites	Cultural Resources (NHLs)	EJ Populations	Noise (Severe/Moderate)	Vibration	Climate Change area of SLR/Storm Surge
D.C.		X	X	—	X	X	—	X	X	—	—	—	—	X	—	X	—	X	X	X	—	—
MD	Prince George's	X	X	X	X	X	—	X	X	—	—	—	X	X	—	X	—	—	X	X	—	X
	Anne Arundel	X	X	X	X	X	—	X	X	—	—	—	X	X	X	X	—	X	—	X	—	X
	Baltimore County	X	X	X	X	X	—	X	—	X	X	—	X	X	X	X	X	—	—	X	X	X
	Baltimore City	X	X	X	X	X	—	X	—	—	X	—	X	X	—	X	X	X	X	X	X	X
	Harford	X	X	X	X	X	—	X	X	X	X	—	X	X	X	X	X	X	X	X	X	X
	Cecil	X	X	X	X	—	—	X	X	—	—	—	X	X	X	X	—	X	—	X	X	X
DE	New Castle	X	X	X	X	X	—	X	X	X	X	X	X	X	X	X	X	X	—	X	X	X
PA	Delaware	X	X	—	—	X	—	X	X	—	—	X	X	X	X	X	X	X	—	X	X	X
	Philadelphia	X	X	—	X	X	—	X	X	—	X	X	X	X	X	X	X	X	X	X	X	X
	Bucks	X	X	X	X	X	—	X	X	—	—	X	X	X	X	X	X	X	—	X	—	X
NJ	Mercer	X	X	X	X	X	—	X	X	—	X	X	X	X	X	X	X	X	X	X	—	—
	Middlesex	X	X	—	X	—	—	X	X	X	—	—	X	X	X	X	X	X	X	X	X	X
	Union	X	X	—	—	X	—	X	X	—	—	—	—	X	X	X	X	X	X	X	—	—
	Essex	X	X	—	—	—	—	X	—	X	X	—	—	X	—	X	X	X	X	X	—	X
	Hudson	X	X	—	—	—	—	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Source: NEC FUTURE team, 2015
X = Potential for effects identified for new segment under Alternative 3.

Table 7.1-6: Summary of Environmental Effects by New Segment (Alternative 3 – New York City to Hartford via Central Connecticut)

State	County	Land Conversions	Displacement/Acquisitions	Prime Farmland	Prime Timberland	Parklands	Wild & Scenic Rivers	Floodplains	Freshwater Wetlands	Saltwater Wetlands	Navigable Waterways	Coastal Zone	ESH	EFH	T&E Species	Geologic Resources	HWCM Sites	Cultural Resources (NHLs)	EJ Populations	Noise (Severe/Moderate)	Vibration	Climate Change area of SLR/Storm Surge
NY	New York	X	X	—	—	—	—	X	—	X	X	X	—	X	X	X	X	—	—	X	X	X
	Queens	X	X	—	—	—	—	X	—	X	X	X	—	X	X	X	X	—	X	X	X	—
	Bronx	X	X	—	—	X	—	X	—	X	X	X	—	X	X	X	X	—	X	X	X	X
	Westchester	X	X	X	X	X	—	X	X	—	—	X	X	—	X	X	X	—	—	X	X	X
	Putnam	—	X	X	X	—	—	—	X	—	—	—	—	—	—	X	X	—	—	—	X	—
CT	Fairfield	X	X	X	X	X	—	X	—	X	X	X	X	X	X	X	X	—	—	X	X	X
	New Haven	X	X	X	X	X	—	X	X	X	X	X	X	X	X	X	X	—	—	X	X	X
	Hartford	X	X	X	X	—	—	X	X	—	X	—	X	X	X	X	X	—	X	X	X	X

Source: NEC FUTURE team, 2015

X = Potential for effects identified for new segment under Alternative 3.

Table 7.1-7: Summary of Environmental Effects by New Segment (Alternative 3 – New York City to Hartford via Long Island)

State	County	Land Conversions	Displacement/Acquisitions	Prime Farmland	Prime Timberland	Parklands	Wild & Scenic Rivers	Floodplains	Freshwater Wetlands	Saltwater Wetlands	Navigable Waterways	Coastal Zone	ESH	EFH	T&E Species	Geologic Resources	HWCM Sites	Cultural Resources (NHLs)	EJ Populations	Noise (Severe/Moderate)	Vibration	Climate Change area of SLR/Storm Surge
NY	New York	X	X	—	—	—	—	X	—	X	X	X	—	X	X	X	X	—	—	X	X	X
	Queens	X	X	—	—	X	—	X	—	X	X	X	X	X	X	X	X	—	X	X	X	X
	Kings	X	X	—	—	—	—	—	—	X	X	X	—	—	—	X	—	—	—	—	X	—
	Nassau	X	X	—	—	X	—	—	X	—	—	—	—	—	X	X	X	—	—	X	X	—
	Suffolk	X	X	X	X	X	—	X	X	X	X	X	X	X	X	X	X	—	—	X	X	—
CT	Fairfield	X	X	—	X	X	—	X	X	X	X	X	X	X	X	X	X	—	X	X	X	X
	New Haven	X	X	X	X	—	—	X	X	X	X	X	X	X	X	X	X	—	—	X	X	X
	Hartford	X	X	X	X	—	—	X	X	—	X	—	X	X	X	X	X	—	X	X	X	X

Source: NEC FUTURE team, 2015

X = Potential for effects identified for new segment under Alternative 3.

Table 7.1-8: Summary of Environmental Effects by New Segment (Alternative 3 – Hartford to Boston via Providence)

State	County	Land Conversions	Displacement/Acquisitions	Prime Farmland	Prime Timberland	Parklands	Wild & Scenic Rivers	Floodplains	Freshwater Wetlands	Saltwater Wetlands	Navigable Waterways	Coastal Zone	ESH	EFH	T&E Species	Geologic Resources	HWCM Sites	Cultural Resources (NHLs)	EJ Populations	Noise (Severe/Moderate)	Vibration	Climate Change area of SLR/Storm Surge
CT	Hartford	X	X	X	X	—	—	X	X	—	X	—	X	X	X	X	X	—	X	X	X	X
	Tolland	X	X	X	X	X	—	X	X	—	—	—	X	—	—	—	X	—	—	X	X	—
	Windham	X	X	X	X	X	—	—	X	—	—	—	X	—	X	—	—	—	—	X	X	—
RI	Providence	X	X	X	X	X	—	X	X	—	X	—	X	X	X	—	—	—	X	X	X	—
MA	Bristol	X	X	X	X	—	—	X	X	—	—	—	X	—	X	—	—	—	—	X	X	X
	Norfolk	X	X	X	X	X	—	X	X	—	—	—	X	—	—	X	X	—	—	X	X	—
	Suffolk	X	X	—	—	—	—	X	X	—	—	X	—	—	X	X	X	—	X	X	X	—

Source: NEC FUTURE team, 2015

X = Potential for effects identified for new segment under Alternative 3.

Table 7.1-9: Summary of Environmental Effects by New Segment (Alternative 3 – Hartford to Boston via Worcester)

State	County	Land Conversions	Displacement/Acquisitions	Prime Farmland	Prime Timberland	Parklands	Wild & Scenic Rivers	Floodplains	Freshwater Wetlands	Saltwater Wetlands	Navigable Waterways	Coastal Zone	ESH	EFH	T&E Species	Geologic Resources	HWCM Sites	Cultural Resources (NHLs)	EJ Populations	Noise (Severe/Moderate)	Vibration	Climate Change area of SLR/Storm Surge
CT	Hartford	X	X	X	X	—	—	X	—	—	X	—	X	X	X	X	X	—	X	X	X	X
	Tolland	X	X	X	X	X	—	X	—	—	—	—	X	—	—	—	X	—	—	X	X	—
	Windham	X	X	—	X	X	—	—	—	—	—	—	X	—	X	—	—	—	—	X	X	—
MA	Worcester	X	X	X	X	X	—	X	—	—	—	—	X	—	—	X	X	—	X	X	X	X
	Middlesex	X	X	X	X	—	—	X	—	—	—	—	X	—	—	X	X	—	—	—	—	—
	Norfolk	X	X	X	X	—	—	X	X	—	—	—	X	—	—	X	—	—	—	X	X	—
	Suffolk	X	X	—	—	—	—	X	X	X	—	X	—	—	X	X	—	X	X	X	X	—

Source: NEC FUTURE team, 2015
X = Potential for effects identified for new segment under Alternative 3.

7.1.2.6 Stations

Station effects would be localized, with the greatest potential effects occurring at new station locations. Table 7.1-10 summarizes the effects for new stations by county. Impacts and areas of concern related to stations are similar to those documented for the Representative Route impacts for each Action Alternative. Station locations are approximate and would be refined and modified as part of subsequent environmental analysis. Station effects could be expected to the following resources:

- Land Cover: There is a potential for land cover conversion and acquisition of public or private property in areas where new stations are proposed. Acquisitions could result in future displacements, but those displacements are not quantified at this time.
- Prime Farmland and Timberland: Potential effects would be expected in areas where new stations are proposed to overlap existing prime farmland or timberland.
- Parklands and Wild and Scenic Rivers: Potential effects have been identified for parklands in station areas outside of the existing NEC. There are no potential effects identified for Wild and Scenic Rivers as part of the Tier 1 EIS.
- Water Resources: Numerous water resources have been identified in the corridor; however, no new stations have been identified in areas where there would be an effect to water resources.
- Ecological Resources: ESH, EFH and T&E species have been identified in potential station areas. The greatest effects could occur in New York and Connecticut.
- Geologic Resources: New stations that geographically coincide with resources that could present engineering difficulties or challenges in obtaining approvals. These resources include sole source aquifers, high incidence of landslide occurrences, naturally occurring asbestos, karst terrain, and mineral resources.
- HWCM: Effects to HWCM sites may occur at stations where new stations are proposed and overlap with HWCM sites.
- Cultural Resources: Adverse or major effects may occur at new stations that affect NRHP-listed, NRHP-eligible, or NHL sites.
- EJ: The benefits and burdens to EJ populations will be assessed for each individual project as part of subsequent environmental analysis.
- Noise and Vibration: Due to the lack of detailed design information, the Tier 1 EIS does not include a quantitative analysis of impacts from stations.
- Climate Change: Under mid-century climate conditions, stations at risk of inundation have been identified. Since no mapping of future riverine inundation hazard areas was undertaken, this assessment does not specifically identify where flood extents will change and therefore which additional stations may be at risk under mid-century climate conditions.

Table 7.1-10: Summary of Environmental Effects for New Stations by County for Action Alternatives

State	County	Station ID	Alt. 1	Alt. 2	Alt. 3	Station Type	Land Conversions	Prime Farmland	Prime Timberland	Parklands	ESH	EFH	T&E Species	Geologic Resources	HWCM Sites	Cultural Resources (NHLs)	Climate Change Inundation Effects Mid-Century
MD	Anne Arundel	183	—	—	X	Major Hub											
	Baltimore City	9	X	X	X	Local				X						X	
		11	—	—	X	Major Hub								X	X	X	
		12	X	X	X	Local				X						X	
		13	X	X	X	Hub	X				X						X
		14	—	—	X		X				X				X		X
	Baltimore County	19	—	—	X	Local											
		20	—	—	X	Hub											
	Harford	21	—	—	X	Local											
	Cecil	23	X	X	X	Local							X			X	
DE	New Castle	26	X	X	X	Local	X		X		X	X	X		X	X	X
		28	X	X	X				X		X		X	X		X	X
PA	Delaware	34	X	X	X	Hub				X			X	X	X		X
		44	—	X	X								X	X			
	Philadelphia	46	—	—	X	Major Hub							X	X			
NJ	Mercer	59	—	—	X	Hub											
	Middlesex	62	X	X	X	Hub	X	X			X		X				
		68	X	X	X	Major Hub					X		X		X		X
	Essex	75	—	—	X	Major Hub											
NY	Bronx	78	X	X	X	Local							X				X
		79	X	X	X								X				
		80	X	X	X	Hub							X				X
		81	X	X	X	Local	X			X	X	X	X				X
	Westchester	87	X	X	X	Hub							X				X
	Queens	145	—	—	X	Hub							X	X			
	Nassau	146	—	—	X	Hub							X	X			
	Suffolk	148	—	—	X	Hub							X	X			
		150	—	—	X												

Table 7.1-10: Summary of Environmental Effects for New Stations by County for Action Alternatives (continued)

State	County	Station ID	Alt. 1	Alt. 2	Alt. 3	Station Type	Land Conversions	Prime Farmland	Prime Timberland	Parklands	ESH	EFH	T&E Species	Geologic Resources	HWCM Sites	Cultural Resources (NHLs)	Climate Change Inundation Effects Mid-Century
NY	Westchester	151	—	—	X	Hub	X	X	X								
		152	—	—	X												
CT	Fairfield	94	X	X	X	Major Hub							X		X	X	X
		106	—	—	X	Hub											X
		107	X	X	X	Local							X				
		154	—	—	X	Hub	X	X	X		X		X				
	New Haven	112	—	—	X	Major Hub							X			X	X
		155	—	—	X	Hub	X		X		X		X				X
		156	—	X	X						X		X				X
	Middlesex	120	X	—	—	Hub	X	X	X		X		X		X		X
	New London	124	X	—	—	Major Hub	X		X		X					X	
	Hartford	161		X		Local	X		X		X					X	X
		164	—	X	X	Major Hub							X	X	X	X	
	Tolland	165	—	—	X	Hub	X	X	X		X						
		166	—	X	X		X	X	X		X					X	
RI	Providence	129	—	X	X	Major Hub				X	X		X			X	X
		130	X	X	X	Local							X				
MA	Worcester	175	—	—	X	Hub	X		X		X						X
	Middlesex	181	—	—	X	Hub	X		X		X						
	Suffolk	142	—	—	X	Major Hub							X		X	X	
		182	—	—	X	Hub											

Source: NEC FUTURE team, 2015

Notes: Land conversions for new stations are inclusive of acquisitions and possible displacements since the FRA assumed that all new station would require acquisitions. There are no wild and scenic rivers or other water resources identified near new stations. EJ populations were identified on a county level and not affiliated with individual station effects.

X = Potential for Effects

— = Not applicable within that alternative/option

Blank Cell = No effects identified for subject resource for listed station for specified alternative.

Due to the nature of noise and vibration impacts, they are not affiliated with individual stations.