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# NEC FUTURE

NEC EUTURE?

The Federal Railroad Administration (FRA) is preparing a comprehensive plan for the Northeast Corridor (NEC) that will define a long-term vision and an incremental approach to achieving that vision. The plan, NEC FUTURE, considers the needs of all types of passengers on the NEC—commuters

# RESULT

The result of NEC FUTURE will be FRA's adoption of an investment program to guide passenger rail improvement projects on the NEC through 2040.

# as well as intercity riders.

# The NEC and Our Economy

The NEC is critical to the continued economic growth and vitality of the Northeast

Bringing the NEC to a state of good repair and relieving existing chokepoints are fundamental to safe and efficient travel in the Northeast

Some 750,000 travelers use the NEC every day to access work and other destinations.



# Vision for the Future

Decisions we make today will determine the role of the NEC in our future

- How will the NEC keep pace with growth in the Northeast?
- How should NEC services evolve?

Rail improvements take a long time to implement. Today's planning lays the foundation for future generations of rail riders.

- The NEC provides the connections to employment centers, educational institutions, and business opportunities that make the region's strong economy.
- The Northeast generates 20 percent of U.S. GDP.
- Unexpected service disruptions on the NEC compromise access to major cities—Washington, D.C., Baltimore, Philadelphia, New York, Boston—and force travelers onto already congested highways and airports.
- The ability of the NEC to accommodate continued growth in population and employment will be a key factor in the economic viability of the Northeast region.

NEC FUTURE helps to ensure that current or pending rail investments are fully integrated into the broader longterm future of the NEC, maximizing the benefits of those investments.



**U.S. Department of Transportation Federal Railroad Administration** 

# Our Future On Track



# STUDY DOCUMENTS

NEC FUTURE includes a broad environmental analysis, called a Tier **1 Environmental Impact Statement** (Tier 1 EIS), that assesses the impacts of proposed improvements, and a Service Development Plan (SDP) that provides the business case for implementing the selected

# STUDY PARTNERS

The FRA is the lead federal agency for NEC FUTURE, working closely with a number of key partners including:

# Federal Transit Administration

 NEC Infrastructure and Operations Advisory Commission

# **REGULATORY COMPLIANCE**

The Tier 1 EIS is being conducted in compliance with the National Environmental Policy Act (NEPA), its implementing regulations, and other applicable laws and regulations, including FRA's Procedures for Considering Environmental Impacts. Concurrent with the Tier 1 Draft EIS, the FRA is conducting a review of potential effects on historic properties under Section 106 of the National Historic Preservation Act.



investment program from the Tier 1 EIS. Together, these studies will guide investments in the corridor through 2040. The outcome will be a package of improvement projects intended for phased completion. Tonight's hearing focuses on the Tier 1 Draft EIS.

 Railroad operators (including Amtrak, eight commuter rail authorities, and freight railroads)

State and federal agencies, as well as local jurisdictions along the NEC







# PUBLIC AND AGENCY INVOLVEMENT

The FRA has conducted an extensive agency and public involvement process to engage stakeholders and the public in the decision-making process for NEC FUTURE. This effort began with an agency and public scoping process in 2012 that elicited over 2,000 comments from 800 participants. These comments, and subsequent input from agencies, railroad operators and the public, helped shape the alternatives that have been analyzed in the Tier 1 Draft EIS.





# Purpose of NEC FUTURE

The purpose of the NEC FUTURE program is to upgrade aging infrastructure and to improve the reliability, capacity, connectivity, performance, and resiliency of passenger rail service on the NEC for both intercity and regional trips, while promoting environmental sustainability and economic growth.

### Needs for the NEC FUTURE program include the following:



# State of Good Repair

Service quality currently falls short, due to the aging and obsolete infrastructure that has resulted from insufficient investment in maintaining a state of good repair on the existing NEC. Achieving and maintaining a state of good repair is needed to improve service.



# Connectivity

The reach and effectiveness of the passenger rail network are limited by gaps in connectivity among transportation modes and between different rail services.



# Capacity

Severe capacity constraints at critical infrastructure chokepoints limit service expansion and improvement, making it difficult to accommodate existing riders and growth in ridership.



# Performance

In many markets, the trip times on passenger rail within the Study Area are not competitive with travel by air or highway. Improvements in travel times, frequency, or hours of service are needed to make passenger rail competitive with other modes.



# **System-Wide Resiliency**

The NEC is vulnerable to the effects of severe storms or other unanticipated events that may cause service disruptions. A more resilient and redundant passenger rail network is needed to enhance safety, security, and the reliability of the region's transportation system.



# **Environmental Sustainability**

Throughout the Study Area, energy use and emissions associated with transportation affect the built and natural environment. Passenger rail can help meet the region's mobility needs with fewer environmental impacts.



# **Economic Growth**

A transportation system that provides options for reliable, efficient, and cost effective movement of passengers and goods is needed for continued economic growth in the Northeast region. The region's knowledge-based economic sector, including academic research and medical facilities, is especially reliant on access to convenient, reliable, and frequent rail service.

### U.S. Department of Transportation

# ALTERNATIVES DEVELOPMENT PROCESS



#### **Alternatives Development**

The FRA designed the NEC FUTURE alternatives development process to consider a broad array of future possibilities for the NEC. The development of alternatives followed a sequential process:

- Initial Alternatives the FRA considered agency and public comments received during scoping, previous studies of the NEC, data on travel markets in the Northeast, and current plans of the NEC states and railroad operators to develop the initial set of alternatives.
- Preliminary Alternatives with further input from agency representatives, railroad operators, and the public, the Initial Alternatives were consolidated into 15 Preliminary Alternatives carried forward for detailed analysis.



Tier 1 EIS Alternatives – the FRA evaluated the Preliminary Alternatives and developed the three Action Alternatives evaluated in the Tier 1 Draft EIS, as well as a No Action Alternative that serves as a baseline for comparison.

### What's in an Alternative?



Infrastructure improvements, defined at a conceptual level, that support the level of service identified



### **Enhanced Service Concepts**

Each of the Action Alternatives includes enhanced service and operations concepts to improve the passenger experience and increase efficiency, such as:

- "Clockface" schedules, in which trains operate at regular 15-, 30-, or 60-minute intervals
- Metropolitan service, a new type of Intercity service that stops at more stations and offers a lower fare than today's Intercity service
- High-performance equipment
- Opportunities for continuous run-through service at stations such as Penn Station New York and Washington Union Station
- Coordinated scheduling and easier transfers



#### **Service Types**

For NEC FUTURE, the FRA categorized passenger rail service into two types—Intercity and Regional rail.

- **Intercity** is passenger rail service between cities or metropolitan areas, operating at speeds and distances greater than that of Regional rail. Intercity serves large, midsize, and selected smaller markets, with station stops typically every 10 to 25 miles. It includes Intercity-Express, a premium high-speed service making limited stops and serving the largest markets.
- **Regional rail** (or commuter) serves local markets, often within one metropolitan area, with station stops typically every 2 to 10 miles. (Eight commuter railroads currently provide regional rail service on the NEC.)









# NO ACTION ALTERNATIVE

### **No Action Alternative**

The No Action Alternative identifies improvements to highway, freight rail, transit, air, and maritime modes that will occur by 2040 regardless of the outcome of NEC FUTURE. It serves as a baseline for comparison with each of the Action Alternatives. The No Action Alternative includes:

- Funded projects or projects with approved funding plans
- Federal or state mandates, such as for safety or accessibility
- Unfunded projects necessary to keep the railroad running



The No Action Alternative cannot accommodate the full volume of passengers who will want to travel by rail. The tightest constraint is at the Hudson River, where demand will exceed capacity



What would selection of the No Action Alternative mean for the future of the NEC?

Except for planned improvements, such as the LIRR East Side Access project, the No Action Alternative:

- Does not increase capacity to meet unmet demand or accommodate growth
- Does not improve reliability, address gaps in connectivity, or expand service to new markets
- Does not bring the NEC into a state of good repair
   In addition, the NEC will remain at risk of service disruption due to infrastructure failures or external events, such as severe weather occurrences.

### The Risks of Disinvestment

The No Action Alternative requires investment in the NEC by the federal government, states, and railroads that exceeds historical levels of funding. If sufficient funding is not made available to support the No Action Alternative, the NEC's reliability, capacity, and service levels will continue to degrade, with the following possible repercussions:

#### by over 6,000 passengers an hour in 2040.



- Reliability will decline, resulting in more frequent and longer delays, and reduced on-time performance of train service
- Scheduled travel times will increase as the deteriorating condition of NEC infrastructure particularly rail, bridge, and foundation that the tracks are built on—will require trains to operate more slowly on some portions of the railroad to ensure safety
- Operating costs for infrastructure maintenance will rise, in response to the need for more frequent maintenance and unscheduled and sometimes substantial repairs
- Costs for train operations will increase as longer cycle times for equipment will require greater fleet sizes and more crew time and overtime
- Ridership will decline in response to the reduced level and performance of passenger rail service, leading to declines in revenue and greater operating losses









Alternative 1 maintains the role of rail as it is today, with significant increases in the level of rail service as required to keep pace with the growth in population. It enables the NEC to continue to support the transportation needs of the growing region through 2040, but provides little additional capacity to support growth after 2040.

#### EXISTING:

- Study Area
- NEC
- Connecting Rail Corridor
- National Rail Network
- Rail Station (not all shown)

REPRESENTATIVE IMPROVEMENTS:

New Segment
 New Track
 Potential Station (not all shown)
 Chokepoint Relief Project

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#### **Representative Route**

 Closely follows the existing route of the NEC. Exceptions include locations where infrastructure is added to provide chokepoint relief or increase capacity.

### Service

 Intercity service increases two to threefold for markets between Washington, D.C., and New York City. Between New York City and Boston, service increases are more dramatic (from 1 to 8 trains an hour at Boston South Station and fewer than 1 to 6 trains an hour at New Rochelle, NY).



### Markets

- Primarily serves existing travel markets.
- Enables expanded service on some Regional rail lines and potential to introduce new one-seat ride services in New Jersey and Connecticut.
- Improves the accessibility of Intercity service, where Metropolitan service is introduced.



### **Infrastructure Elements**

- Eleven chokepoint relief projects: seven south of New York City in Maryland, Delaware, Pennsylvania, and New Jersey, and four north of New York City to address conflicting train movements in New York, Connecticut, and Massachusetts.
- Through trips on connecting corridor services are improved in Washington, D.C., Philadelphia, New York City, New Haven, and Boston.
- Regional rail service to existing markets increases to meet demand.
   Peak-hour Regional rail service in markets from Washington, D.C., to New York City more than doubles.
- Five new track projects: two in Maryland, one in New Jersey, one north of Midtown Manhattan on the Hell Gate Line in Queens, NY and Bronx, NY, one in Rhode Island, and one in Massachusetts.
- Three new segments:
  - New Baltimore tunnel
  - Hudson River third and fourth tunnels and expanded Penn Station New York
  - Old Saybrook, CT to Kenyon, RI new segment







## Alternative 1 Maintain

# BENEFITS COMPARED TO NO ACTION ALTERNATIVE



#### **Aging Infrastructure**

Brings the existing NEC to a state of good repair



#### Connectivity

Improves connections between metropolitan areas with more frequent intercity service



### Capacity

- Provides sufficient capacity to accommodate demand at all places along the corridor (except at the Hudson River) through 2040, but lacks sufficient additional capacity to support growth in demand after 2040
- Increases capacity for through-trips on connecting corridor services south of Washington, D.C., and along the Keystone, Empire, and New Haven-Hartford-Springfield corridors



#### Performance

- Increases Intercity and peak-hour Regional rail (commuter) service
- Top Intercity-Express operating speeds of 160 mph on portions of the corridor
- Travel time between Washington, D.C., and Boston reduced by up to 35 minutes
- New service types with a range of pricing to attract more passengers



#### Resiliency

 New segment between Old Saybrook, CT, and Kenyon, RI, provides resiliency, avoiding movable bridges and waterways along the Long Island Sound and providing an alternative to portions of the existing NEC adjacent to the Connecticut shoreline



#### **Sustainability**

- Net decrease in emissions of pollutants and greenhouse gases and reduction in roadway vehicle miles traveled
- Shifts 69 million trips from other modes to passenger rail



#### **Economic Growth**

 Improves access to jobs within and between metropolitan areas for existing stations; generates some travel time savings for intercity travel









Alternative 2 grows the role of rail, expanding service at a rate greater than the growth in regional population and employment. It adds service to new markets in New England and provides modest capacity to support growth beyond 2040.

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1	Washir	ngton,	D.C.	DE
>>	2			
X				
5	VA			
• R	ichmond			
>	7			

#### EXISTING:

- Study Area
- NEC
- Connecting Rail Corridor
- National Rail Network
- Rail Station (not all shown)

#### REPRESENTATIVE IMPROVEMENTS:

New Segment
 New Track
 Potential Station (not all shown)
 Chokepoint Relief Project

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#### **Representative Route**

- Follows the existing NEC between Washington, D.C., and New Haven, CT, with exceptions to provide chokepoint relief or improve capacity and performance.
- North of New Haven, a new route is provided for Intercity-Express and Metropolitan trains running between New York City and Boston. The new route runs on new tracks between New Haven and Meriden, CT, shares the existing Hartford Line between Newington, CT, and Hartford, CT, and runs on new tracks between Hartford, CT, and Providence, RI.

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#### Markets

- Improves the level-of-service available to all of the existing NEC markets and taps potential new travel markets that are currently not served or are not well-served today.
- Hartford becomes a market on the NEC Spine rather than part of a connecting corridor. Other locations along the New Haven-Hartford-Springfield corridor gain improved trip times and service offerings.
- Philadelphia International Airport has a station directly on the NEC with frequent Intercity-Express, Metropolitan, and Regional rail service.
- Improvements to the Long Bridge corridor between Washington, D.C., and Alexandria, VA, coupled with improvements at Washington Union Station, permits Metropolitan service and select Regional rail trains to run through Union Station, effectively extending the reach of the NEC.



#### Service

- Intercity service increases five times at some locations. Between New York City and Boston, increases are more dramatic (from 1 to 10 trains an hour at Boston South Station).
- Through trips on connecting corridor services are improved in Washington, D.C., Philadelphia, New York City, New Haven, and Boston.
- Regional rail peak-hour service more than doubles. At heavily traveled locations, such as the Hudson River, service increases from 21 trains per hour to 42. Alternative 2 also allows for increased express service, reduces average trip times and increases service to some Regional branch lines.



### **Infrastructure Elements**

- Nine chokepoint relief projects: six south of New York City and three north of New York City to address conflicting train movements.
- Five new track projects: three in Maryland, one north of Midtown Manhattan on the Hell Gate Line in Queens, NY and Bronx, NY, one in Rhode Island, and one in Rhode Island and Massachusetts.
- Eleven new segments, in addition to the new route between New Haven and Boston. These include:
  - Southern area: new Baltimore tunnel; Aberdeen, MD, to Newark, DE; Baldwin, PA, to Philadelphia 30th Street Station; and Philadelphia 30th Street Station to Bridesburg, PA
  - Central area: North Brunswick, NJ, to Colonia, NJ; Elizabeth, NJ, to Secaucus, NJ; Secaucus, NJ, to Hell Gate Viaduct, Queens, NY; and New Rochelle, NY, to Westport, CT
  - Northern area: Sharon, MA, to Canton Junction, MA







# Alternative 2 Grow

# BENEFITS COMPARED TO NO ACTION ALTERNATIVE



#### **Aging Infrastructure**

Brings the existing NEC to a state of good repair



#### Connectivity

- Connects new travel markets in the Connecticut River Valley
- Provides Intercity service to T.F. Green Airport in Providence, RI, and Philadelphia International Airport
- Improves interregional connections by introducing Intercity service at select rail stations



### Capacity

- Provides sufficient capacity to accommodate demand at the Hudson River and provides room for growth at other locations post-2040
- Addresses capacity and speed constraints with a new route adjacent to the NEC between New Haven and Hartford, CT, and Providence, RI; this supplements existing service between New York City and Boston and connects new travel markets
- Increases capacity for through trips on connecting corridor services south of Washington, D.C., and along the Keystone, Empire, and New-Haven-Hartford-Springfield corridors



#### Performance

- Provides five times as much Intercity service and more than doubles peak-hour Regional rail service
- Top Intercity-Express operating speeds of 160 mph on the majority of the corridor
- Travel time between Washington, D.C., and Boston reduced by up to 1 hour 5 minutes

#### Resiliency

- New inland route through Connecticut and Rhode Island provides an alternate route if coastal inundation or other hazards affect services along the coastline



#### **Sustainability**

- Net decrease in emissions of pollutants and greenhouse gases and reductions in roadway vehicle miles traveled
- Shifts 93 million trips from other modes to passenger rail



#### **Economic Growth**

- Improves access to jobs within and between metropolitan areas for existing and new stations with increased service frequency, service types, and improved travel times
- Provides improved access between metropolitan areas and commercial centers such as Wilmington, DE, and Hartford, CT.
- Creates opportunities for economic and station area development









Alternative 3 transforms the role of rail. Along with improvements to the existing NEC, a second spine from Washington, D.C., to Boston supports faster trips and serves markets not currently well connected by passenger rail. Rail becomes the dominant mode of travel in the Northeast, with the capacity to support the regional economy well into the future.

#### REPRESENTATIVE IMPROVEMENTS:

#### EXISTING:

Study Area

NEC

- Connecting Rail Corridor
- National Rail Network
- Rail Station (not all shown)

Southern Route (Second NEC Spine)

- Optimize Potential Station (not all shown)
- Northern Route Options (Second NEC Spine)
- New Segment
  - New Track
  - Chokepoint Relief Project

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#### **Representative Route**

- Closely parallel to the existing NEC between Washington, D.C., and New York City, with the exception of a few locations where it deviates to shorten trip times or serve additional travel markets, such as more direct routes through downtown Baltimore and Philadelphia.
- North of New York City, four route options are considered:
  - Alternative 3.1: Central Connecticut/Providence
  - Alternative 3.2: Long Island/Providence
  - Alternative 3.3: Long Island/Worcester



#### Markets

- Expands the reach of the NEC with additional rail capacity and faster trip times.
- Several new geographic markets become part of the NEC and gain direct and frequent service:
  - Downtown Baltimore and Downtown Philadelphia
  - Central Connecticut Corridor, including White Plains, NY, and Danbury and Waterbury, CT, (Alternatives 3.1 and 3.4 route options)
  - Long Island (Nassau and Suffolk Counties) and Jamaica, Queens (Alternatives 3.2 and 3.3 route options)

- Alternative 3.4: Central Connecticut/Worcester
- The existing NEC remains as a route for Intercity and Regional rail trains.

### Service

- Intercity service increases six-fold at some locations. North of New York City, service increases to 8 to 10 peak-hour trains, compared to 1 or less in the No Action Alternative.
- Through trips on connecting corridor services are improved in Washington, D.C., Philadelphia, New York City, New Haven, and Boston.
- Peak-hour Regional rail service nearly triples over the No Action Alternative for many locations south of New York City, and nearly doubles north of New York City. Average trip times are reduced and express service is increased. Service to branch lines increases and more through service is available where transfers are required in the No Action Alternative. Trip times are greatly reduced for long-distance commuters.

- Hartford, CT, and Springfield, MA
- Hartford-Providence Corridor (Alternatives 3.1 and 3.2 route options)
- Hartford-Worcester-Boston Corridor (Alternatives 3.1 and 3.4 route options)

### Infrastructure Elements

- Nine chokepoint relief projects: seven south of New York City, and two north of New York City, to address conflicting train movements.
- Four new track projects: two in Maryland, one north of Midtown Manhattan on the Hell Gate Line in Queens, NY and Bronx, NY, and one in Rhode Island and Massachusetts.
- New segments parallel to and outside of the existing NEC right-of-way, providing a second spine route between Washington, D.C., and Boston.
- Alternative 3 also increases the capacity of the existing NEC with a new Baltimore tunnel, downtown routing in Baltimore and Philadelphia, a new route through New York City that results in six tracks in tunnels beneath the Hudson and East Rivers, and new segments parallel to the existing NEC between New Rochelle, NY, and Stamford, CT.





# Alternative 3 Transform

# BENEFITS COMPARED TO NO ACTION ALTERNATIVE





#### **Aging Infrastructure**

Brings the existing NEC to a state of good repair



#### Connectivity

- Connects new travel markets throughout the NEC with the addition of a second spine and new
- stations
- Provides Intercity service to T.F. Green Airport, in Providence, RI, and Philadelphia International Airport
- Improves interregional connections by introducing Intercity service at select rail stations



Provides excess capacity at all locations along the corridor to accommodate additional off-corridor trips and future growth post-2040



#### Performance

- Provides six times as much Intercity service and up to three times the amount of peak-hour Regional rail service
- Top Intercity-Express operating speeds of 220 mph on the second spine
- Travel time between Washington, D.C., and Boston reduced by up to 2 hours 55 minutes

#### Resiliency

Inland route options assist in reducing service disruptions should a coastal flooding or other unanticipated event affect assets along coastal Connecticut and Rhode Island





#### **Sustainability**

- Net decrease in emissions of pollutants and greenhouse gases and reductions in roadway vehicle miles traveled
- Shifts 141 million trips from other modes to passenger rail



#### **Economic Growth**

- Improves access to jobs within and between metropolitan areas for existing and new stations with increased service frequency, service types and improved travel times
- Creates opportunities for economic and station area development with more connections within and between metropolitan areas both along the existing NEC and to markets served with a second spine
- Provides passenger rail network coverage and capacity to support population and employment growth beyond 2040





# EVALUATING THE ALTERNATIVES



### What do the Alternatives Mean?

Each of the Action Alternatives represents a distinct vision and level of investment for the NEC. In the Tier 1 Draft EIS, the FRA has evaluated each Action Alternative in comparison with the No Action Alternative.

The evaluation considers seven factors, representing each of the seven needs identified in the Purpose and Need, as well as environmental impacts, benefits, and costs. The analysis is at a broad level and the results are representative of what could occur in each alternative. The results are intended to help inform public dialogue, which is critical to FRA's decision-making process.



### Key Takeways

- NEC ridership is strong today, and will be stronger in the future if improvements are made to support reliable and frequent travel options.
  - Improvements to rail service result in a shift of riders from both highways and air, reducing energy usage and emissions.
  - As metropolitan areas have grown, the "hard line" between Intercity and Regional rail markets has blurred. Metropolitan service, which operates with higher performance equipment, stops at a mix of Intercity and Regional rail stations, and offers a lower fare relative to existing intercity service, taps this emerging market.
  - The New York market drives demand for both Intercity and Regional rail ridership: 52-63% of all trips on the NEC are projected to start or stop at Penn Station New York in 2040.
- Footprint-related (physical) environmental impacts occur mostly where new off-corridor segments are proposed. However, more

### **RIDERSHIP**



### **LEVEL OF INVESTMENT\***

route-miles off-corridor provide more travel time savings, greater resiliency and redundancy, more places reachable by rail, and greater opportunity for growth in rail service beyond 2040.

With more route miles off-corridor, higher levels of investment are needed.

### What's Next?

FRA will use the findings of the Tier 1 Draft EIS and input received during the public comment period to identify a Preferred Alternative for future investment. The Preferred Alternative does not require any entity to fund or construct specific projects, but establishes the envelope within which improvements would occur. The decision and Preferred Alternative will be documented in the Tier 1 Final EIS.



\*Estimates are intended to be representative of the relative levels of investment that could be required and are for comparative purposes.





# TRANSPORTATION EFFECTS







### Connectivity

The No Action Alternative assumes additional investment in the NEC that exceeds existing funding levels, but does not fund improvements necessary to achieve a state of good repair. All of the Action Alternatives bring

#### **Daily Trains between Station Pairs**

Representativ	e Station Pair	<b>No Action</b>	Alternative 1	Alternative 2	Alternative 3
Washington Union Station	Penn Station New York	36	70	96	150

- the NEC to a state of good repair by:
- Replacing or renewing aging infrastructure
- Eliminating the backlog of infrastructure requiring replacement

New Haven	Philadelphia	18	50	85	107
Penn Station New York	Boston South Station	19	47	88	143



**Express Travel Times** from Washington, D.C., to Boston, MA

**No Action Alternative** 

6 hours 15 minutes

Capacity

Intercity Peak Hour Trains at Hudson River (Largest Chokepoint on the NEC)



(hours:min)

No Action

### Alternative 1 Ö Ö Ö Ö Ö Ö Ö Ö Ö Ö



## Alternative 3









### **Economic Effects Include:**

- Greater flow of people within the major metropolitan economies
- Opportunities for station area development
- Improved passenger rail service to new markets that could transform development patterns
- Temporary (construction) and permanent jobs (hiring to operate and maintain expanded rail services)



Benefits to freight movement by addressing select chokepoints 

### **Jobs Accessible within 30 Minutes by Train**

Metropolitan Area	<b>No Action</b>	Alternative 1	Alternative 2	Alternative 3*
Washington, D.C.	1,570,000	1,630,000	2,010,000	2,000,000
Trenton	1,760,000	1,760,000	3,200,000	4,700,000
New York	3,360,000	4,200,000	4,770,000	4,600,000 - 5,820,000
Hartford	300,000	300,000	540,000	620,000 - 870,000
Boston	510,000	510,000	840,000	840,000 - 920,000

\*Range of results, depending on the route option

### **Economic Development**

The FRA conducted a series of workshops throughout the region in 2014 to gain the perspective of private developers, local planning and development specialists, and academic experts on the economic development potential associated with rail service improvements. Participants agreed that improved rail access and connectivity, particularly in new markets, could accelerate development.

- Boston and New York participants stressed the benefits for their labor markets in being able to attract skilled workers. For Boston employers, the potential for a convenient day trip between Boston and New York City was perceived as a major benefit.
- Participants in Baltimore, Wilmington, and

### **Airport Access**

The FRA has heard from many stakeholders about the need for improved rail access to the region's airports, which serve as gateways to the national and global economy. The No Action Alternative provides Intercity service to connections at Baltimore-Washington International Airport and Newark Liberty International Airport. Each Action Alternative adds new air-rail links:

- Alternative 1 adds a connection at T.F. Green Airport in Providence, RI.
- Alternative 2 and two of the Alternative 3 route options, 3.1 (Central Connecticut/Providence), and 3.4 (Central Connecticut/Worcester) add air-rail links at Philadelphia International Airport and T.F. Green Airport.
- Two of the Alternative 3 route options, 3.2 (Long Island/Providence) and 3.3 (Long Island/Worcester) add four new air-rail links, including Philadelphia International Airport, T.F. Green Airport, and connections at Jamaica, Queens, and Ronkonkoma in New York to John F. Kennedy International Airport and Long Island MacArthur Airport, respectively.

Philadelphia saw opportunities for greater labor market integration among these urban areas if rail service were to become more frequent and costcompetitive. Enhanced rail service was viewed as essential for recruiting talent and bringing jobs to Baltimore and Wilmington.

- Participants in both Long Island and Connecticut also felt that their economies could attract and retain jobs more successfully with the implementation of enhanced rail service.
- At each workshop, participants cited connectivity to New York as a priority for economic development, suggesting that the economy of the corridor will remain "New York-centric" even as smaller markets become more integrated over time.





# RESILIENCY AND SUSTAINABILITY FUTURE

### **System-wide Resiliency**

Resiliency of the NEC passenger rail network is based on its ability to continue to function even during unanticipated outages, catastrophic events, or weather-related events. The destruction caused by Hurricane Irene and Superstorm Sandy has raised awareness of the vulnerability of the NEC and connecting services.



All three Action Alternatives provide:

- Redundancy by adding various new segments along the corridor (see example below)
- Opportunities to build and design new or modified rail assets to increase resiliency and minimize the effects of flooding or storm events

Acreage at Risk of Flooding, **Existing NEC vs. Old Saybrook-Kenyon New Segment** 



### **Environmental Sustainability**



There is national, regional, state, and local interest in how the transportation system, and in particular the rail network, can positively contribute to the overall environmental quality of the region.

- All Action Alternatives reduce net emissions of criteria pollutants and greenhouse gases.
- All Action Alternatives reduce energy use.

**Riverine Flooding** 

Sea Level Kise

Existing NEC
New Segment

Note: Includes representative routes for Alternative 1 in Middlesex and New London Counties, CT and Washington County, RI

All Action Alternatives have the potential to support transit-oriented development, particularly at major stations.









# ENVIRONMENTAL ANALYSIS

### Level of Detail

A Tier 1 EIS is a broad, high-level environmental review.

- "Desktop analysis" based on available mapping and information; no field investigations
- Service-related effects (noise, vibration, energy, air quality, etc.) based on representative service data
- Physical (footprint) effects (water resources, ecological resources, parklands, cultural resources, etc.) based on representative routes
- Analysis provides conservative estimates that will

### **Environmental Effects Assessment**

A range of benefits and effects were analyzed for **each Action Alternative** based on proposed service and infrastructure improvements:

#### **Effects**

- Direct footprint and service-related effects to the built and natural environment for various resource areas such as ecological and hydrologic resources, noise and vibration, air quality, and cultural and historic resources
- Indirect effects on the built and natural environment as a result of induced growth and associated changes in development

#### be refined during subsequent Tier 2 studies



### **Analytical Approach**

Cumulative effects when considered with other past, present or future, local, regional or statewide projects

#### **Benefits**

- Traveler service benefits associated with improved capacity, mobility, and connectivity
- Change in mode choice (from cars, airplanes to rail) and improvements in air quality and energy consumption
- Redundancy by adding various new segments along the corridor
- Opportunities to increase resiliency and minimize the effects of flooding or storm events
- Improved capacity, mobility and connectivity for Environmental Justice populations along the NEC



- Mapping overlays used to calculate effects
- Resource shape files overlain on Representative **Routes of Action** Alternatives







### KEY RESOURCE AREA EFFECTS AS COMPARED TO THE NO ACTION ALTERNATIVE

Land CoverHonore in the intervence of th	Resource	Alternative 1 Alternative 2		Alternative 3		
By Bruchen How CharacteriaParket Connects:Parket Connects:Parket Connects:I under GeringLandte Connects:Searchen Accordence Connects:Searchen Accordence Connects:I under GeringLandte Connects:Searchen Accordence Connects:Searchen Accordence Connects:I under GeringLandte Connects:Searchen Accordence Connects:Searchen Accordence Connects:I under GeringLandtence Connects:Searchen Connects:Searchen Connects:I under GeringLandtence Connects:Searchen Connects:Searchen Connects:I under GeringSearchen Connects:	Land Cover					
c. ever deep forsingsSubfract and sensesting in sensest manufact that accreasting (1)Offinities to deep version (s) large likely in the events of the event	States with Greatest Total Conversions (non- transportation to transportation use)	Maryland, Connecticut	Maryland, Connecticut	Maryland, Connecticut		
Environmental Justice (E.J)*Contributions (F)Environmental Justice (E.J)*Contributions (F)Environmental Controp (F)Environmental DatabaseEnvironmental Controp (F)<	Other Key Findings	Least total conversions	Greatest undeveloped land conversions (CT)	Greatest total conversions (via Long Island/ Worcester)		
Pair is where the LP positionSolutions (by child solutions (by child solutions (by child solutions (by child solutions (b)	Environmental Justice (EJ)*					
Hydrologic Resources       Connecticut particularly New Nace Connecticut Particularly Nace Connecticut Particular Particulary Nace Connecticut Particular Particon Particu	Counties Where Presence of EJ Populations Intersect with the Highest Number of Environmental Impacts	<ul> <li>Baltimore City, MD</li> <li>Fairfield County, CT</li> </ul>	<ul> <li>Philadelphia County, PA</li> <li>Middlesex County, NJ</li> <li>Queens County, NY</li> <li>Fairfield County, CT</li> </ul>	<ul> <li>Baltimore City and Harford Counties, MD</li> <li>Philadelphia County, PA</li> <li>Bronx and Queens Counties, NY</li> <li>Fairfield and Hartford Counties, CT</li> <li>Providence County, RI</li> <li>Worcester County, MA</li> </ul>		
States When the Model Hydning's Resuruses       Examedicating indicating indicating the example of the models in the models indicating i	Hydrologic Resources					
Other Key FindingsInit and Chip Alizanative that blacks John Heinz Wild IP BedueCrosses 111 Jairgable Walermaps:Clinate Change• Bealinone City, MD • Hudson, NJ • Hudson, NJ • Hudson, NJ • Hudson, NJ • Fairind, CT • New Yohk City, NY • Fairind, CT • New London, CT• New Castle, DE • Hudson, NJ • New Yohk City, NY • Hudson, CT • New London, CT• New Castle, DE 	States Where the Most Hydrologic Resources are Affected	Connecticut (particularly New Haven, Middlesex, and New London Counties)	Connecticut (particularly New Haven, Middlesex, Hartford, and New London Counties)	New York and Connecticut (resources associated with Long Island Sound)		
Climate Change         Countes with Highest Risk of Flooding <ul> <li>Baltmare City, MD</li> <li>Hudson, NJ</li> <li>New Vac City, NY</li> <li>New London, CT</li> </ul> <li>Parklands</li> <li>Provides realiency/redundancy with Old Saybrook, CT to Rev Tonk City and Hactbord and Hactbord to Boalon</li> Provides realiency/redundancy with routs aption between Rev York City and Hactbord and Hactbord to Boalon           Other Key Findings         Provides realiency/redundancy with Old Saybrook, CT to Rev London, CT <li>Provides realiency/redundancy with routs aption between Rev York City and Hactbord and Hactbord to Boalon</li> <li>Parklands</li> <li>States with Greatest Impacts</li> <li>Provides realiency/redundancy with routs aption Sayaro Wack Hactbord</li> <li>MRP Sites Macteod*</li> <li>143</li> <li>171</li> <li>182-150</li> <li>Washington Sayaro Wack Hattoric Defend, PA</li> <li>Andatusia, PA</li>	Other Key Findings	n/a	Only Alternative that bisects John Heinz Wildlife Refuge (DE, PA)	Crosses 11 Navigable Waterways		
Counters with Highest Risk of Rooding• Batimare City, MD • Hudson, NJ • Rew York City, NY • Rew Haven, CT • New Haven, CT • New London, CT• New Castlie, DE • Hudson NJ 	Climate Change					
Other Key Findings       Provides resiliency/redundancy with 0id Saybrook, CT b       Provides resiliency/redundancy with New Haven- Hartford-Providence Segment       Provides resiliency/redundancy with nute option between New York City and Hartford and Hartford         Parkiands       States with Greatest Impacts       Rhode Island	Counties with Highest Risk of Flooding	<ul> <li>Baltimore City, MD</li> <li>Hudson, NJ</li> <li>New York City, NY</li> <li>Fairfield, CT</li> <li>New Haven, CT</li> <li>New London, CT</li> </ul>	<ul> <li>Philadelphia, PA</li> <li>Hudson, NJ</li> <li>New Haven, CT</li> <li>New London, CT</li> </ul>	<ul> <li>New Castle, DE</li> <li>Hudson, NJ</li> <li>New York City, NY</li> <li>New London, CT</li> </ul>		
ParklandsStates with Greatest ImpactsRhode IslandRhode IslandRhode Island, New YorkParks Affected97111116-130Cultural and Historic PropertiesNRHP Sites Affected*143171132-150NRHP Sites Affected*143171Nashington Square West Historic District, PA - Nashington Square West Historic District, PA - Andalusia, PANashington Square West Historic District, PA - Reading Terminal and Trainshed, PA - Andalusia, PANashington Square West Historic District, PA - Reading Terminal and Trainshed, PA - Andalusia, PA - Andalusia, PA - Andalusia, PANashington Square West Historic District, PA - Reading Terminal and Trainshed, PA - Andalusia, PA - John Bartram House, PA - Andalusia, PA - John Bartram H	Other Key Findings	Provides resiliency/redundancy with Old Saybrook, CT to Kenyon, RI Segment	T to Provides resiliency/redundancy with New Haven- Hartford-Providence Segment to Boston			
States with Greatest ImpactsRhode IslandRhode IslandRhode Island, New YorkParks Affected97111111116-130Cultural and Historic PropertiesNRHP Sites Affected*143171132-150NRHP Sites Affected*143171132-150NHLs (Key Properties) Affected*143171132-150NHLs (Key Properties) Affected*143171132-150Reading Terminal and Trainshed, PA - Andalusia, PA- Fairmount Waterworks, PA - John Bartram House, PA - Andalusia, PA- Washington Square West Historic District, PA - Reading Terminal and Trainshed, PA 	Parklands					
Parks Affected97111116-130Cultural and Historic PropertiesNRHP Sites Affected*143171132-150NHLs (Key Properties) Affected*143171132-150NHLs (Key Properties) Affected*- Fairmount Waterworks, PA - Andalusia, PA- Fairmount Waterworks, PA - John Bartram House, PA - Andalusia, PA- Washington Square West Historic District, PA - Reading Terminal and Trainshed, PA - Andalusia, PA - John Bartram House, PA - Andalusia, PA -	States with Greatest Impacts	Rhode Island	Rhode Island	Rhode Island, New York		
Cultural and Historic Properties         NRHP Sites Affected*       143       171       132-150         NRHS (Key Properties) Affected*       143       171       Washington Square West Historic District, PA         NHLs (Key Properties) Affected*       + Fairmount Waterworks, PA       + John Bartram House, PA       + Reading Terminal and Trainshed, PA         • Andalusia, PA       - Andalusia, PA       - Andalusia, PA       - Andalusia, PA         • Ecological Resources       - New Haven, New London, and Fairfield Counties, CT, are, in general, the counties with highest overall potential ecological resource impacts         • New Haven, New London, and Fairfield Counties, CT, are, in general, the counties with highest overall potential ecological resource impacts         • A number of large ecological habitats and wildlife refuges are clipped or bisected: Patuxent Research Refuge, Anacostia and Gunpowder Falls (MD); John Heirig Maragement Area/Great Swamp (BI); and Paugussett State Forest and Rocky Neck State Park, (CT)	Parks Affected	97	111	116-130		
NRHP Sites Affected*143171132-150NHLs (Key Properties) Affected*- Fairmount Waterworks, PA - Andalusia, PA- Fairmount Waterworks, PA - John Bartram House, PA - Andalusia, PA- Washington Square West Historic District, PA - Reading Terminal and Trainshed, PA - Andalusia, PA - John B. Smith Building, MAEcological Resources- New Haven, New London, and Fairfield Counties, CT, are, in general, the counties with highest overall potential ecological resource impacts - A number of large ecological habitats and wildlife refuges are clipped or bisected: Patuxent Research Refuge, Anacostia and Gunpowder Falls (MD); John Heinz National Wildlife Refuge (PA), Laurel Ridge Setauket Woods Nature Preserve, Pelham Bay Park, and Savon Woods County Park (NY); Great Swamp Management Area/Great Swamp (RI); and Paugussett State Forest and Bocky Neck State Park (CT)	<b>Cultural and Historic Properties</b>	Cultural and Historic Properties				
NHLs (Key Properties) Affected* <ul> <li>Fairmount Waterworks, PA</li> <li>Andalusia, PA</li> <li>Andalusia, PA</li> <li>Andalusia, PA</li> <li>Andalusia, PA</li> <li>Andalusia, PA</li> <li>John Bartram House, PA</li> <li>Andalusia, PA</li> <li>Andalusia, PA</li> <li>John B. Smith Building, MA</li> </ul> Ecological Resources <ul> <li>New Haven, New London, and Fairfield Counties, CT, are, in general, the counties with highest overall potential ecological resource impacts</li> <li>A number of large ecological habitats and wildlife refuges are clipped or bisected: Patuxent Research Refuge, Anacostia and Gunpowder Falls (MD); John Heinz National Wildlife Refuge (PA), Laurel Ridge Setauket Woods Nature Preserve, Peham Bay Park, and Saxon Woods County Park (NY); Great Swamp (RI); and Paugussett State Forest and Rocky Neck State Park (CT)</li></ul>	NRHP Sites Affected*	143	171	132-150		
Ecological Resources         Key Findings         New Haven, New London, and Fairfield Counties, CT, are, in general, the counties with highest overall potential ecological resource impacts         A number of large ecological habitats and wildlife refuges are clipped or bisected: Patuxent Research Refuge, Anacostia and Gunpowder Falls (MD); John Heinz National Wildlife Refuge (PA), Laurel Ridge Setauket Woods Nature Preserve, Pelham Bay Park, and Saxon Woods County Park (NY); Great Swamp Management Area/Great Swamp (RI); and Paugussett State Forest and Rocky Neck State Park (CT)	NHLs (Key Properties) Affected*	<ul> <li>Fairmount Waterworks, PA</li> <li>Andalusia, PA</li> </ul>	<ul> <li>Fairmount Waterworks, PA</li> <li>John Bartram House, PA</li> <li>Andalusia, PA</li> </ul>	<ul> <li>Washington Square West Historic District, PA</li> <li>Reading Terminal and Trainshed, PA</li> <li>Andalusia, PA</li> <li>John B. Smith Building, MA</li> </ul>		
<ul> <li>New Haven, New London, and Fairfield Counties, CT, are, in general, the counties with highest overall potential ecological resource impacts</li> <li>A number of large ecological habitats and wildlife refuges are clipped or bisected: Patuxent Research Refuge, Anacostia and Gunpowder Falls (MD); John Heinz National Wildlife Refuge (PA), Laurel Ridge Setauket Woods Nature Preserve, Pelham Bay Park, and Saxon Woods County Park (NY); Great Swamp Management Area/Great Swamp (RI); and Paugussett State Forest and Rocky Neck State Park (CT)</li> </ul>	Ecological Resources					
*Notes:	Key Findings *Notes:	<ul> <li>New Haven, New London, and Fairfield Counties, CT, are, in general, the counties with highest overall potential ecological resource impacts</li> <li>A number of large ecological habitats and wildlife refuges are clipped or bisected: Patuxent Research Refuge, Anacostia and Gunpowder Falls (MD); John Heinz National Wildlife Refuge (PA), Laurel Ridge Setauket Woods Nature Preserve, Pelham Bay Park, and Saxon Woods County Park (NY); Great Swamp Management Area/Great Swamp (RI); and Paugussett State Forest and Rocky Neck State Park (CT)</li> </ul>				

Environmental Justice populations include minority and low income populations, as specified in Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 16, 1994)

NRHP - National Register of Historic Places

NHL - National Historic Landmarks





# SECTION 106 REVIEW HISTORIC RESOURCES



To consider the potential effects on the historic properties along the NEC, the FRA is conducting a review under Section 106 of the National Historic Preservation Act of 1966. This review is concurrent with the NEPA process, and has resulted in a programmaticlevel identification of all resources listed on the National Register of Historic Places that may be affected by implementation of the alternatives, as well as a Draft Programmatic Agreement.





The Draft Programmatic Agreement documents the Section 106 compliance as part of the Tier 1 EIS and lays out the framework for Section 106 compliance in future Tier 2 actions:

- Built in flexibility to carry Programmatic Agreement to 2040
- State-specific appendices for each participating state

#### **Participants in Programmatic Agreement**

#### Signatories

- Federal Railroad Administration (FRA), Advisory Council on Historic Preservation (ACHP), State Historic Preservation Offices (SHPOs) (all 8 States and Washington, D.C.)
- Invited Signatories
  - Federal Transit Administration (FTA)
- Consulting Parties
  - Federally recognized Tribes
  - National, state, and local historic preservation organizations
  - Rail owner/operators along the NEC
  - Various state and local entities







# LET US HEAR FROM YOU BY JANUARY 30, 2016!



### What's Next?

#### FRA will identify a Preferred Alternative using:

- Public and stakeholder input
- Findings of the Tier 1 Draft EIS
- FRA policy guidance

#### Announce Preferred Alternative

Public and stakeholders notified (spring of



2016)

### Prepare Tier 1 Final EIS

 Documents the Preferred Alternative and provides responses to comments received during the public comment period (to be released Fall 2016)

### 4 Ways You Can Submit Your Comment!



Comment via email: comment@necfuture.com

Submit a comment online at: www.necfuture.com



Or send comments to: NEC FUTURE USDOT, Federal Railroad Administration One Bowling Green, Suite 429

**New York, NY 10004** 



### Thank You for Participating!







#### U.S. Department of Transportation