



U.S. System Summary: NORTHEAST CORRIDOR



Northeast Corridor High-Speed Rail System (Source: NEC Future)

The Northeast Corridor high-speed rail system is an existing system containing 669 miles of routes in three segments across the Northeastern and Mid-Atlantic U.S. states, encompassing major U.S. cities including Boston, MA; New York, NY; Philadelphia, PA; and Washington, D.C. High-speed rail service is currently *Operational* in the two segments between Boston, MA, and Washington, D.C., with train speeds up to 150 mph between Boston and New York and up to 135 mph between New York and Washington, D.C. A second, alternative route segment between Boston, MA, and New York, NY, has been outlined in Amtrak’s most recent plan update and is currently in the *Proposed* stage. All three segments of

the Northeast Corridor high-speed rail system are part of the federally-designated Northeast Corridor High-Speed Rail Corridor. Amtrak, the U.S. national railroad passenger corporation, owns a majority of the right-of-way in the two segments of the Northeast Corridor high-speed rail system between Boston, New York, and Washington, D.C. Due to the high density of development along the route, most improvements to operational high-speed rail service would likely be contained within the existing Northeast Corridor (NEC) right-of-way. The latest proposed “Next Gen” route, however, calls for constructing new railroad infrastructure over a new, shorter route between Boston and New York with maximum train speeds up to 220 mph.

SYSTEM DESCRIPTION AND HISTORY

System Description

The Northeast Corridor high-speed rail system consists of three segments, as summarized below.

Northeast Corridor High-Speed Rail System Segment Characteristics

Segment Description	Distance	Segment Status	Designated Corridor?	Segment Population
Boston, MA, to New York, NY (Shoreline)	231 Miles	Operational	Yes	19,508,811
Boston, MA, to New York, NY (Next Gen)	212 Miles	Proposed	Yes	20,721,192
New York, NY, to Washington, D.C.	226 Miles	Operational	Yes	28,348,493

The Boston, MA, to New York, NY, segment of the Northeast Corridor high-speed rail system is described as two segments: a “Shoreline” segment and a Next Gen segment. The Shoreline segment is 231 miles in length and connects Boston and New York via Providence, RI; New London, CT, New Haven, CT, and Stamford, CT. Existing high-speed rail service on the Shoreline segment is currently operated by Amtrak’s Acela Express electric high-speed rail service over existing right-of-way owned by Amtrak or local commuter rail transit agencies. The Acela Express achieves a maximum speed of 150 mph in three sections totaling approximately 34 miles of the 231-mile segment, with an overall average speed of approximately 62 mph. Amtrak’s conventional Northeast Regional trains operate over the same corridor, although at slower overall speeds. The total population of communities served by existing Acela Express service along this segment was 19,508,811 in 2010. The Next Gen alignment, proposed by Amtrak as a future improvement plan to service in the New York-Boston segment of the NEC, is 212 miles in length and connects Boston and New York via Providence, RI, Hartford, CT, and New Rochelle, NY. The Next Gen segment definition is inspired by Amtrak’s *A Vision for High-Speed Rail in the Northeast Corridor*, which proposes next generation electric high-speed rail service over a combination of new right-of-way and existing Northeast Corridor alignment with maximum speeds of 220 mph. The total population of communities being considered for proposed Amtrak Next-Gen high-speed rail service along this segment was 20,721,192 in 2010.

The New York, NY, to Washington, D.C., segment of the Northeast Corridor high-speed rail system described in this summary is 226 miles in length and includes major communities such as Newark, NJ; Philadelphia, PA; Wilmington, DE; and Baltimore, MD, along the route. The Amtrak Acela Express high-speed rail service also currently operates over this segment, with train speeds reaching up to 135 mph along portions of the route with an

average speed of approximately 86 mph. Amtrak owns the entire 226-mile segment. Amtrak’s conventional Northeast Regional trains also operate over the same corridor at slower speeds. The total population of communities served by existing Acela Express service along this segment was 28,348,493 in 2010.

System History

Development of high-speed intercity passenger rail service in the Northeast Corridor high-speed rail system dates back to the *High-Speed Ground Transportation Act of 1965*, which authorized more than \$51 million for improvements to the NEC route. At that time, the line was owned by the Pennsylvania Railroad, who had electrified the New York to Washington, D.C., segment in the early 1930s. Initial high-speed train demonstration projects were implemented by the Penn Central Railroad on both segments of the corridor in the late 1960s, and these projects were shifted to Amtrak when it took over U.S. passenger train operations in May 1971. In 1976, as part of the Penn Central restructuring into Conrail, ownership of the Northeast Corridor right-of-way was transferred to Amtrak. The Northeast Corridor Improvement Project was also initiated in 1976, with \$1.6 billion authorized for improvements across the Boston to Washington, D.C., route. The improvement project was successful at reducing trip times along the corridor and other capacity improvements.

In the early 1990s, further improvement projects were authorized and funded, laying the groundwork for the implementation of true high-speed rail along the entire corridor. In July 1994, the Federal Railroad Administration published *The Northeast Corridor Transportation Plan: New York City to Boston*, in which it outlined the plan for electrification of the Boston to New York segment of the corridor and other improvements needed to implement modern high-speed rail along the corridor. In December 2000, after a number of delays, the Acela Express high-speed rail service was inaugurated by Amtrak in the Northeast Cor-



Acela Express High-Speed Train Operating on Existing NEC (Source: Bombardier)

ridor between Boston, New York, and Washington, D.C. Ridership on the Acela Express has grown steadily in more than a decade of service, and the route is the flagship of the Amtrak national intercity passenger rail network.

In May 2010, the *Northeast Corridor Infrastructure Master Plan* was released. The *Master Plan* was developed by a region-wide collaboration, which included 12 Northeastern states, the District of Columbia, Amtrak, the Federal Railroad Administration, eight commuter rail operators, and three freight railroads operating in the Northeast Corridor. Initiated in 2007, the *Master Plan* reflects existing goals and plans for rail operations in the Northeast Corridor through 2030, and outlines infrastructure projects that would be necessary to meet those goals. In September 2010, Amtrak released a report entitled *A Vision for High-Speed Rail in the Northeast Corridor*. In this report, Amtrak outlined its proposal for a next-generation high-speed rail system covering a new Boston to New York “Next Gen” high-speed passenger rail segment and the existing New York to Washington, D.C., segment. In July 2012, Amtrak released an update to the 2010 *Vision Plan*. The 2012 update report consolidated the projects outlined in the *Master Plan* and the 2010 *Vision Plan* with a *Business & Financial Plan* developed in 2011 by Amtrak for its Northeast Corridor high-speed rail services.

Amtrak’s July 2012 update report outlined a “stair-step” phasing strategy for implementing its proposed Next-Gen

high-speed rail system in the Northeast Corridor. The first step, called the NEC Upgrade Program (or NEC-UP), is a set of proposed projects that would provide a maximum authorized speed of 160 mph across the Northeast Corridor, increase capacity in constrained areas of the line, and bring the corridor into a state of good repair. The NEC-UP program would be completed between 2015 and 2025 and lay the groundwork for the second program step, the NEC Next-Generation High-Speed Rail (NEC NextGen HSR). The NEC NextGen HSR program would be completed between 2025 and 2040 and includes as its centerpiece a new, dedicated high-speed intercity passenger rail alignment between New Rochelle, NY, and Providence, RI. The proposed alignment (called the Boston to New York Next Gen segment in this summary) would deviate from Amtrak’s existing route (called the Shoreline segment in this summary) and would be a more direct route between New York and Boston resulting in additional reduced travel time. Between New York and Washington, D.C., the proposed NEC NextGen HSR would generally follow Amtrak’s existing right-of-way. As proposed, the NEC NextGen HSR service would operate using electric-powered trains at a maximum speed of 220 mph, reducing travel times between Boston and New York from 214 minutes in 2010 to 94 minutes in 2040 if implemented. Travel times between New York and Washington, D.C. would be reduced from 160 minutes to 94 minutes under the Next Gen plan.



Union Station, Washington, D.C.

Recently, the Federal Railroad Administration initiated planning studies for major long-term improvement of high-speed intercity passenger rail in the Northeast Corridor high-speed rail system. A major component of this effort is a Tier 1 environmental impact statement (EIS) to address the broad environmental effects of improved passenger rail service and related construction activities. In January 2012, the White House Council on Environmental Quality selected the Northeast Corridor Tier 1 EIS project to be included in a pilot project aimed at identifying inefficiencies and expediting the environmental review process for transportation projects. As of July 2012, the Tier 1 EIS study has been initiated as part of a comprehensive planning effort for the corridor known as NEC FUTURE. The NEC FUTURE program will also include a service development plan for the corridor.

Federally-Designated Corridors

The entire Northeast Corridor high-speed rail system described in this summary is part of the federally-designated Northeast Corridor High-Speed Rail Corridor (NEC). The NEC achieved federally-designated corridor status on March 14, 2011, per announcement by U.S. DOT Secretary Ray LaHood. The designation includes the existing NEC mainline and any alternative routings for intercity

passenger train service between the metropolitan areas of Washington, D.C.; Philadelphia, PA; New York, NY; and Boston, MA. The NEC had not been previously considered for federally-designated corridor status because the original intent of the federally-designated high-speed rail corridors program was to provide funding for highway-rail grade crossing improvements, and very few such crossings remained on the NEC when the program was established in 1991. With the creation of new high-speed rail funding programs in the *Passenger Rail Investment and Improvement Act of 2008* and those programs requiring federally-designated corridor status for funding eligibility, designation of the Northeast Corridor as the 11th federally-designated high-speed rail corridor was a necessary step in the further development of high-speed rail improvements in the corridor.

Existing Intercity Passenger Rail Service

The Northeast Corridor high-speed rail system region is the busiest rail transportation corridor in the U.S. More than 150 Amtrak trains use portions of the existing corridor on a typical weekday, with operations including Acela Express premium high-speed rail service, Northeast Regional high-speed rail service, Keystone Service and other corridor trains, and long-distance trains.

In addition to Amtrak operations, more than 2,200 commuter rail trains operate in the Northeast Corridor on an average weekday.

Sources: 2010 U.S. Census, *High-Speed Rail Projects in the United States: Identifying the Elements of Success Part 2*, *The Northeast Corridor Transportation Plan: New York City to Boston*, *Northeast Corridor Infrastructure Master Plan*, *A Vision for High-Speed Rail in the Northeast Corridor*, *The Amtrak Vision for the Northeast Corridor: 2012 Update Report*, Federal Railroad Administration, *Amtrak System Timetable Fall 2011/Winter 2012*

ESTIMATED SYSTEM COSTS AND FUNDING SOURCES

Estimated System Costs

The Northeast Corridor high-speed rail system is one of the most complex rail lines in the world, with billions of dollars being invested over the past several decades to implement high-speed intercity passenger rail service along the route. Much of the infrastructure being used for high-speed rail service in the NEC was originally built more than 80 years ago and the density of development along the route limits the amount of new right-of-way that is available for projects. Amtrak's ownership of a majority of the existing NEC route means that capital improvement projects are largely limited to Amtrak's annual budget or state-led investments to improve capacity in coordination with Amtrak. As a result, capital cost figures estimated from planning documents are unique to the complexities of the Northeast Corridor and are not directly comparable to costs for other proposed U.S. high-speed rail systems in existing freight rail corridors or in a new right-of-way.

The *Northeast Corridor Infrastructure Master Plan* identified \$43.3 billion of capital investment needed between 2010 and 2030 to meet "state of good repair" backlog requirements and to meet projected growth needs. Approximately half of this estimate is related to capital improvements for tunnels and major bridges along the route. The state of good repair backlog component is approximately \$8.8 billion, reflecting many years of deferred maintenance and increasing costs along the busy NEC route. Phase 1 priority projects identified in the *Master Plan* include trip-time improvements, state of good repair programs, and other capacity improvements totaling \$13.861 billion, of which \$4.711 billion (approximately \$20 million per mile) is for improvements Boston to New York while \$9.150 billion (approximately \$40 million per mile) is for improvements New York to Washington, D.C. The July 2012 *Amtrak Vision for the Northeast Corridor: 2012 Update Report* estimated that the capital construction costs of the two-

step NEC NextGen HSR system proposed in the report would be approximately \$151.5 billion in (2011 dollars). This estimate included \$14.7 billion for the New York City Gateway Program (improved high-speed rail access to central Manhattan via tunnel) as well as \$7.6 billion for high-speed rail rolling stock and rolling stock servicing facilities. The cost estimate also included approximately \$3 billion for improvements for the Philadelphia to Harrisburg and New Haven to Springfield lines, which fall outside the scope of the Northeast Corridor high-speed rail system as defined here.

High-speed rail service is currently operational in the Northeast Corridor, with Amtrak's Acela Express reaching speeds up to 150 mph.

Projected Funding Sources

The July 2012 *Amtrak Vision for the Northeast Corridor: 2012 Update Report* examined the potential for fees paid by local commuter rail transit agencies to access the Northeast Corridor infrastructure as well as local Tax Increment Financing (TIF) districts as two potential funding mechanisms for developing high-speed rail in the Northeast Corridor high-speed rail system. In its report *Making High-Speed Rail Work in the Northeast Megaregion*, the University of Pennsylvania proposed an HSR Trust Fund as a dedicated funding mechanism for high-speed rail in the Northeast Corridor. The HSR Trust Fund would operate similar to the existing Highway Trust Fund, and could receive money from the general fund, collect regional taxes, issue bonds, and allocate this money for high-speed rail funding.

Recent Funding Awards

More than \$865 million was awarded to Amtrak and several Northeastern and Mid-Atlantic states for improvements to the Northeast Corridor high-speed rail system region. The source for these awards was high-speed rail funds appropriated in the *American Recovery and Reinvestment Act of 2009*. Awards included the following:

- Amtrak: \$449,944,000 for improvements related to power, signal system, track, and catenary.
- Maryland: \$91,400,000 for three projects covering tunnel, bridge, and station improvements.
- New York: \$294,781,579 to construct a new conflict-free route at the Harold Interlocking in Queens, NY.

Project will allow Amtrak trains to bypass the busy interlocking and improve travel time and reliability.

- Rhode Island: \$29,200,000 for three projects to increase high-speed rail track capacity and for improvements to stations in Providence and Kingston.

High-speed rail appropriations for FY 2010 provided an award of \$13,300,000 to the Delaware Transit Corporation for construction of a high-speed third track on the NEC near Wilmington. Additionally, \$10,000,000 was awarded to the Federal Railroad Administration to lead multi-state planning and environmental review activities for the Northeast Corridor.

Source: Northeast Corridor Infrastructure Master Plan, The Amtrak Vision for the Northeast Corridor: 2012 Update Report, A Vision for High-Speed Rail in the Northeast Corridor, Federal Railroad Administration

TRANSPORTATION SYSTEM IMPACTS

Ridership

During the 12-month period ending September 30, 2011, ridership on the premium Acela Express high-speed rail service between Boston, New York, and Washington, D.C., was 3,379,126 passengers, an increase of 5 percent over the previous 12-month period. Amtrak's non-premium high-speed rail service in the NEC, the Northeast Regional service, carried 7,514,741 passengers during this time period, an increase of 5.1 percent over the previous year. Ridership forecasts prepared as part of the May 2010 *Northeast Corridor Infrastructure Master Plan* estimated that annual ridership on the Northeast Corridor high-speed rail system (Boston to Washington, D.C., over existing alignments) would be approximately 23 million passengers by the year 2030, a 76 percent increase over 2010 ridership levels (13 million passengers). This increase was due, in part, to a projected increase in the number of daily Amtrak trains operating in the Northeast Corridor from 154 in 2010 to 210 in 2030 (increase of 36 percent).

The *Amtrak Vision for the Northeast Corridor: 2012 Update Report*, released in July 2012, proposed a 220 mph next-generation high-speed rail system covering the Boston to New York Next Gen segment and the New York to Washington, D.C., segment. Amtrak estimates that full implementation of its vision would attract 43.5 million annual passengers to the Northeast Corridor by the year 2040, of which 29.7 million would be passengers on the NEC Next-Gen HSR services and 13.8 million would be passengers on Regional services. The Next Gen plan ridership projections include 10 million more passengers than what is pro-

jected under the *Northeast Corridor Infrastructure Master Plan*. Most of this growth is anticipated in the Boston to New York segment, where the travel time savings relative to current conditions would be greater due to the use of the Next Gen alignment rather than the Shoreline alignment.

Mode Choice

Since the introduction of Amtrak's Acela Express high-speed rail service in 2000, the share of rail passengers in the New York to Washington, D.C., air-rail market has increased from 37 percent to 69 percent. The May 2010 *Northeast Corridor Infrastructure Master Plan* estimated that the NEC projects outlined in the *Master Plan* would generate a net reduction in vehicle-miles traveled (VMT) in excess of 2.7 billion miles by the year 2030 (as compared with the base year of 2009). This VMT reduction would translate to a fuel savings of approximately 104 million gallons and a greenhouse gas savings of 926,000 tons of CO₂-e. Amtrak's *A Vision for High-Speed Rail in the Northeast Corridor plan*, released in September 2010, projected that a fully-implemented Next Gen plan would be able to capture 53 percent of all travel between Boston and New York and 39 percent of all travel between New York and Washington, D.C. The July 2012 *Amtrak Vision for the Northeast Corridor: 2012 Update Report* projected that 40.9 percent of new rail passengers in the year 2040 would be attracted from air, while 34.0 percent would be attracted from auto, 19.9 percent would be induced demand, and 5.3 percent would be attracted from intercity bus service.

Connectivity with Other High-Speed Rail Systems

The three segments of the Northeast Corridor high-speed rail system connect to four other U.S. high-speed rail systems in five separate locations: the Northern New England high-speed rail system in Boston, MA, and New Haven, CT; the Empire Corridor high-speed rail system in New York, NY; the Keystone high-speed rail system in Philadelphia, PA; and the Southeast high-speed rail system in Washington, D.C.

Sources: Amtrak Government Affairs, Northeast Corridor Infrastructure Master Plan, A Vision for High-Speed Rail in the Northeast Corridor, The Amtrak Vision for the Northeast Corridor: 2012 Update Report



Acela Express and Metro-North commuter trains share the same tracks through Connecticut.

GOVERNANCE

Intercity passenger rail planning and implementation activities in the Northeast Corridor high-speed rail system are coordinated by Amtrak (owner of a majority of the infrastructure) in conjunction with the various state Departments of Transportation, transit agencies, and freight railroads along the corridor. Regional policy and planning groups such as the I-95 Coalition, the Coalition of Northeastern Governors, the Regional Plan Association, and the Port Authority of New York & New Jersey are also involved with many planning activities related to high-speed rail in the Northeast Corridor high-speed rail system. In particular, the Coalition of Northeastern Governors and the Regional Plan Association have been active in developing policy positions related to advanced high-speed rail development in the Northeast Corridor.

The *Passenger Rail Investment and Improvement Act of 2008* established the Northeast Corridor Infrastructure and Operations Advisory Commission. The Commission is comprised of members from each of the Northeast Corridor states, Amtrak, and the U.S. DOT. The mission of the Commission is to lead the development of a unified long-term investment strategy and to coordinate planning

activities for the Northeast Corridor. The first meeting of the Commission was held in September 2010. It is expected that the *Northeast Corridor Infrastructure Master Plan* will be a key resource to guide Commission activities. In its report *Making High-Speed Rail Work in the Northeast Megaregion*, the University of Pennsylvania proposed a new governing body, the Northeast Corridor Commission, to oversee high-speed rail development in the corridor. The proposed Commission could emerge from the Northeast Corridor Infrastructure and Operations Advisory Commission, and would coordinate the planning, design, construction, and operation of high-speed rail in the corridor.

Sources: Northeast Corridor Infrastructure and Operations Advisory Commission Website, Making High-Speed Rail Work in the Northeast Megaregion



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Note: Pages 87 – 138 of this report provides a detailed history of the development of high-speed intercity passenger rail in the Northeast Corridor, including details of the various Northeast Corridor Improvement Projects starting in the mid-1970s.

Date Accessed: March 20, 2012