

## Amtrak's Northeast Corridor Facts and Background Information



### Overview

Amtrak owns and operates 363 miles of the 457-mile Northeast Corridor (NEC) between Washington and Boston (a total of 1,219 track miles). Two sections are owned by others: 1) 56 miles on Metro North between New Rochelle, N.Y., and New Haven, Conn.; 2) the state of Massachusetts owns 38 miles between the Massachusetts/Rhode Island border and Boston that is operated and maintained by Amtrak. Amtrak also owns 62 miles of track between New Haven and Springfield, Mass., as well as 104 miles of track (274 track miles) between Philadelphia and Harrisburg.

The NEC is home to one of the busiest, most complex, technically advanced track structures in the world with over 2,000 trains on Amtrak-controlled segments each weekday, including slow freight trains traveling at speeds of 30-50 mph, commuter trains that travel at speeds up to 125 mph, Amtrak *Regional* trains that travel at 110 or 125 mph, and *Acela Express* trains that can reach speeds of 150 mph. This makes it the fastest railroad in the western hemisphere, and among the ten fastest in the world. These trains all share the same overcrowded, and often overwhelmed, track. The infrastructure deteriorated greatly in the years following completion of the federally funded Northeast Corridor Improvement Project in the early 1980's. Very little was spent to upgrade the capital facilities on the NEC other than the funds to electrify the track north of New Haven in the 1990's.

That changed starting in mid-2003, with a new emphasis placed on bringing Amtrak's equipment and infrastructure closer to a state of good repair. Amtrak began the process of ramping up a significant capital program and has made substantial progress in addressing the backlog of capital needs throughout its system.

Continuation of the state of good repair program is allowing Amtrak to rebuild its infrastructure and equipment with many positive benefits to its bottom line and riders. This work will allow Amtrak to run trains faster and more reliably with lower operational costs. Passengers have seen modest trip-time reductions on both ends of the NEC and much improved on-time performance, as well as more comfortable trips with upgraded, smoother riding equipment. Amtrak will see ridership and revenue growth and reduced maintenance and emergency repair costs with a modernized infrastructure.

### Fiscal 2010 Northeastern Ridership by Route

Acela Express	3.219 million	(Washington-New York-Boston)
Regional (1)	8.107 million	(Newport News-Washington-Boston/Springfield)
Downeaster	0.478 million	(Boston-Portland)
Keystone	1.297 million	(New York-Philadelphia-Harrisburg)
Empire	1.378 million	(New York-Albany-Toronto)
Adirondack	0.119 million	(New York-Albany-Montreal)
Pennsylvanian	0.203 million	(New York-Harrisburg-Pittsburgh)
Vermont	0.086 million	(Washington-New York-St. Albans, Vt.)
Ethan Allen	0.048 million	(New York-Albany-Rutland, Vt.)

**Total: 14.925 million**

#### Notes:

(1) Excludes long-distance train ridership over NEC; includes NEC-only travel of some other short-distance routes shown here.

Nationally, Amtrak ridership in Fiscal 2010 was 28.7 million. The Northeastern services total over half of all ridership nationwide and three-fifths of all passenger revenue. Amtrak serves 69% of the air/rail market between Washington and New York and 51% of the air/rail market between New York and Boston (third quarter, FY10).

**Fiscal 2010 Usage of Selected Northeastern Stations**

Includes all boardings and alightings:

New York Penn Station	8.378 million
Washington Union Station	4.573 million
Philadelphia 30th Street	3.787 million
Boston (North, South, Back Bay, Route 128)	2.570 million
Baltimore Penn Station	0.926 million
Albany-Rensselaer	0.737 million
New Haven	0.723 million
Wilmington	0.697 million
Newark Penn Station	0.658 million
BWI Marshall Airport	0.654 million
Providence	0.602 million
Harrisburg	0.547 million
Lancaster	0.515 million

**Commuter and Freight Railroads**

While Amtrak's intercity trains account for the majority of train-miles on the NEC, eight commuter authorities also provide service over Amtrak-owned and operated infrastructure on the NEC. The number of commuter trains and their ridership has grown steadily in recent years. Today there are 1,862 commuter trains on the NEC with an average weekday ridership of 722,900.

The following authorities provide service over portions of the Northeast Corridor: Massachusetts Bay Transportation Authority, Rhode Island Department of Transportation, Shore Line East (SLE), Long Island Rail Road, New Jersey Transit, Southeastern Pennsylvania Transportation Authority, Delaware Department of Transportation, MARC, and Virginia Railway Express. Additional service by the Amtrak operates SLE and MARC (Penn Line) trains under contract with their respective authorities.

These commuter railroads depend upon Amtrak's NEC track and signal infrastructure and dispatching for their reliable operation of their services. Amtrak also provides track construction, signal, and other engineering services for major commuter railroad infrastructure projects along the NEC.

The NEC plays a vital role in regional freight service, moving virtually all such traffic to and from Brooklyn, Queens, Long Island, and the Delmarva Peninsula. Much traffic serving southern New England, the ports of Baltimore and Wilmington, and power plants in the Baltimore-Washington area uses the NEC. Six freight railroads operate approximately 50 trains a day on the NEC.

**Overview of Capital Program**

Amtrak had a minimal capital program until mid-2003, when the Engineering Department shifted the focus from emergency repair to production. Due to the need to reorganize the workforce and the difficulty in getting the necessary supplies and materials, the capital program took over a year to get

fully ramped up and it was not until the summer of 2004 that Amtrak's capital program reached a peak level of production. The table below includes examples of capital work completed since then:

Category	Concrete ties installed	Wood ties installed	Continuous welded track installed (miles)	Under-cutting (track foundation, track miles)	Shoulder cleaned (track miles)	Signal cable replaced (miles)	Electric catenary hardware renewed (miles)	Undergrade bridges improved
FY02	0	16,000	8	9	0	9	48	0
FY03	104,000	49,000	26	10	0	23	39	33
FY04	152,000	59,000	240	40	35	11	77	17
FY05	159,657	45,172	75	17	43	3	74	18
FY06	111,299	90,362	35	8	24	2	61	12
FY07	83,683	93,779	31	1	137	10	61	11
FY08	98,725	63,101	34	0	143	15	42	22
FY09	133,584	99,894	34	0	180	13	33	22
FY10	206,966	55,180	36	0	89	15	41	0

### **Track Infrastructure**

Work to replace old wooden ties with more durable concrete ties was suspended in 1998 due to Amtrak's budget constraints. As a result, many miles of track had to have speeds reduced to as low as 60 mph for the safe operation of trains. The average life of rail on the NEC is 40 years and as little as seven along curves. This translates to a need to replace an average of 43 miles of rail a year along the NEC. However, due to deferral of capital programs, on average less than 6 miles of rail per year was replaced in the seven years before 2003.

Having a good track structure is essential to meeting the goals of improved safety, train reliability, and shorter schedules. As a result of a 54% increase in annual capital spending in Fiscal 2003 through 2010, the infrastructure reliability as reflected in Engineering delays to train operations improved by 46%—resulting in an average 20% improvement to *Acela Express* on-time performance—while reducing the Operating man-hours by 8%. These improvements were made in an operating environment where the frequency of *Acela Express* trains increased by 24%.

### **Communication and Signals**

C&S work continues on the multi-year Dock Interlocking Project at Newark, New Jersey. Signals for Dock West are being rehabilitated and converted to light emitting diode (LED) signals. A new cable trough/walkway is 80% complete at Dock West. The Central Instrument Housing (CIH) for Dock is being wired at the Lancaster Shop in Pennsylvania and field work for cabling the CIH has begun.

Signal improvements on the Harrisburg Line are ongoing with bidirectional signals being placed into service between Cork (Lancaster) and Leaman. The reconfiguration of Cork Interlocking was completed and is in service. Reconfiguration at Leaman Interlocking is completed and operational. C&S will continue to work on bidirectional signaling in FY11 between Leaman and Park.

C&S forces continued to support the Track Department as they installed turnouts at Hudson, Union and North Penn Interlockings along the NEC. C&S forces supported the ongoing tie replacement projects on the New England and New York Divisions. They also are being used in support of the East Side Access Project, which will connect the Long Island Rail Road in Queens to Grand Central

Terminal in Manhattan. Union Interlocking was placed in service. This retired one of the remaining towers on the NEC.

Work continues to update and expand Positive Train Control on the NEC and Michigan Lines. Work also continues on various communications projects including the installation of radio cable in the New York and Baltimore Tunnels as well as enhancements to the communication system from New York to Washington. These projects are being funded with ARRA (economic stimulus) funds.

### **Electric Traction**

The NEC is electrified, allowing Amtrak and commuter trains to operate “under the wire” at faster speeds and with quicker accelerations than diesel-electric locomotives would allow. Much of the infrastructure supporting the electric catenary system was built in the 1920’s and 1930’s and is in constant need of repair.

The current five-year plan calls for completion of catenary-system restoration work on the main line between New York and Washington, returning it to a state of good repair by Fiscal 2013. Progress made in Fiscal 2010 included:

- Renewal of 40.5 miles of electric catenary hardware.
- Installation of eight new electric traction transformers—3 in Landover (MD), one each in Kearny (NJ), Princeton (NJ), Cornwells (PA), Thorndale (PA), and Philadelphia (Frankford Section).
- Installation of seven new 12 kilovolt electric traction circuit breakers.
- Continued construction of a new substation and transmission line in Ivy City Yard in Washington. When completed, the new 5.2 mile transmission line will feed a new 2-transformer substation that will greatly enhance voltage regulation and stability in the yard and terminal areas. This project is scheduled for completion in August 2011.
- Began construction of a new 138 kilovolt power cable and duct bank from PSE&G’s Metuchen station to the NEC at Milepost 25.1, a distance of 1.5 miles. This project will be completed in February, 2011.
- Began a major upgrade to Lamokin Frequency Converter Station, which includes rewinding of existing motor-generators, replacing the 60 Hertz input to the motor-generators, and new transformers, breakers, cable, and controls in the 25 Hertz portion of the yard
- Began a major upgrade to Jericho Park Frequency Converter Station, replacing the power electronics modules and upgrading the air handling system. This project will be completed by September, 2011.

Also in 2010, our contractor continued to perform catenary renewal work on the Hell Gate portion of the NEC in the Bronx and Queens, New York. This segment has some of the oldest catenary components on the NEC, which has had many failures and required many repairs. Work is scheduled to be complete in August of 2011.

### **Bridges and Tunnels**

Amtrak has 17 tunnels consisting of 29.7 miles of track and 1,186 bridges consisting of 42.5 miles of track on the NEC. Of these bridges, 14 of them are moveable bridges between Washington and Boston. Several are in southeastern Connecticut, of which two—Niantic and Connecticut River (both built in 1907)—have needed varying levels of repair or replacement to improve reliability and decrease the chance of a failure that will shut off either train or boat traffic. In recent years, both Niantic and Connecticut River have been prone to operating failures and unreliability.

In January 2010, Amtrak awarded a \$104.7 million contract to Cianbro/Middlesex for replacement of the Niantic Bridge. Work began in April 2010 and is expected to take three years. The bridge at Connecticut River has some serious structural deficiencies and is budgeted to be replaced in a multi-year project costing \$200 million. The preliminary environmental permit process for Connecticut River is progressing. Also, Amtrak is working with New Jersey Transit on preliminary design for a replacement of the Portal swing bridge at Kearny, New Jersey.

In Fiscal 2008, Amtrak completed the replacement of the lift span of the Thames River Bridge, located between New London and Groton, Connecticut. This replacement was a complex, three-year project with a total cost of \$92 million. In a 12-day process in June 2008, the old 1919 bascule lift portion of the bridge was removed and the new vertical lift segment installed in its place.

**Keystone Corridor Improvement Project**

Amtrak and the Pennsylvania Department of Transportation collaborated and shared the \$166-million cost of the Keystone Corridor Improvement Project between Philadelphia and Harrisburg, during Fiscal 2000 through 2006. This work resulted in restoration of electric-powered train service, an increase in train frequency from 11 to 14 weekday trains each way, and a reduction in express train travel times from 120 to 95 minutes, effective in October 2006. The Keystone Service FY10 ridership increased 91% vs. FY00, with a 58% increase since the end of the project in FY06.

**Impact on On-Time Performance**

The work done in recent years allowed Amtrak to reduce the scheduled running times of the premier *Acela Express* service by five minutes between Washington and New York at the fall 2006 timetable change. Also, *Acela Express* on-time performance (within 10 minutes of schedule) began to improve, as shown in this table:

Fiscal Year	Acela Express on-time performance
2003	70.7%
2004	74.3%
2005	76.4%
2006	84.6%
2007	87.8%
2008	84.5%
2009	87.2%
2010	80.6%

On-time performance rose steadily to a peak of 87.8% in Fiscal 2007 and surpassed the 90.0% goal in four months of that year. However, it declined in Fiscal 2008, due in part to slow orders caused by defective concrete ties, delays to trains operating where concrete tie repair work was taking place, and delays caused by the Hell Gate catenary renewal project. While on-time performance improved in Fiscal 2009, it declined in Fiscal 2010 due to weather-related delays, increased commuter train conflicts, and increased scheduled maintenance of way work.