The Future of the Northeast Corridor

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The NEC today

A densely-populated region, providing a healthy traffic base

High-speed, all-weather service

Accessible urban terminals

A right-of-way that supports 125-150 mph service
What they have

AVE Class 102 train – built by Talgo and Bombardier for RENFE (Spanish national rail operator) in 2005.

...on the Paracuellos de Ribera viaduct, part of the Madrid-Barcelona high speed line, opened in 2003.

Infrastructure designed to realize the potential of the equipment.
.....and what we have

Acela – built by Bombardier and Alstom for Amtrak in 2000

Widened with cantilevered addition in 1910

Double-tracked in 1860

Electric catenary added and bridge deck rebuilt, 1999

......on the Canton Viaduct – built by George Washington Whistler for the Boston & Providence Railroad in 1835

Equipment designed to operate within the constraints imposed by the infrastructure
The NEC is a bona-fide HSR operation.....

<table>
<thead>
<tr>
<th>Line</th>
<th>15 mph (CL I)</th>
<th>16-30 mph (CL II)</th>
<th>31-60 mph (CL III)</th>
<th>61-80 mph (CL IV)</th>
<th>81-90 mph (CL V)</th>
<th>91-110 mph (CL VI)</th>
<th>111-125 mph (CL VII)</th>
<th>126-150 mph (CL VIII)</th>
<th>Total Track Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEC Main Stem</td>
<td>4.7</td>
<td>18.8</td>
<td>68.4</td>
<td>145</td>
<td>144.6</td>
<td>273.7</td>
<td>267.6</td>
<td>195.4</td>
<td>1118.2</td>
</tr>
<tr>
<td>Percentage</td>
<td>0.4%</td>
<td>1.7%</td>
<td>6.1%</td>
<td>13.0%</td>
<td>12.9%</td>
<td>24.5%</td>
<td>23.9%</td>
<td>17.5%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Does not include about 400 miles of miscellaneous yard tracks

About 65.9% of the Amtrak-owned NEC Main Stem trackage usable for 110-150 mph service

Amtrak is the only company in America to maintain track for 110+ mph service
...but it depends on century-old infrastructure

**Connecticut River Bridge**
- Built in 1873
- Cost to replace: $1.2 billion
- Major bottleneck
- 30 mph speed restriction
- Water infiltration problems

**Susquehanna River Bridge**
- Built in 1907
- Cost to replace: $100 million
- 2nd most active
- Reliability & fatigue issues

**Portal Bridge**
- Built in 1906
- Cost to replace: $550 million
- SOGR and capacity needs

**Pelham Bay Bridge**
- Built in 1906
- Cost to replace: $225 million
- Most active – 4K openings/yr
- Fatigue issues

**Niantic River Bridge**
- Built in 1907
- Cost to replace: $225 million
- Most active – 4K openings/yr
- Fatigue issues

**B&P Tunnel**
- Built in 1907
- Cost to replace: $210 million
- Major bottleneck
- 420 trains/day

**B&P Tunnel**
- Built in 1873
- Cost to replace: $1.5 billion
- Major bottleneck
- 420 trains/day

- Replacement proceeding
The Situation in Northern New Jersey

- Greatest operational challenge on the NEC
  - Density (NJT, Amtrak)
  - Operating geography
  - Infrastructure age
- Service disruptions here ripple through the system, causing further disruptions at distant terminals:
  - Miami
  - Chicago
  - New Orleans

North River Tunnels – Weehawken Portal

Portal Bridge
- 70 mph speed restriction

North River Tunnels
- 60 mph speed restriction

Newark Penn Station
- 90 mph territory

Manhattan
- 75 mph territory

At peak, 1 train enters tunnel every 150 seconds
In spite of these challenges...

- Amtrak carries more people than all of the airlines put together between:
  - New York and Washington
  - New York and Boston
- We’re operating a vital transportation link that can touch 150 mph – but we’re running on century-old infrastructure
- How do we solve this problem – and how do we grow?

**Amtrak Facts**

- Acela service introduced – 86% growth in South End ridership between FY 2000 and FY 2010
- Regional service introduced – 160% growth in North End ridership between FY 2000 and FY 2010

**Air-Rail Market Share**

- **New York to Boston Air-Rail Market**
  - 20% 27% 41% 35% 39% 38% 36% 41% 49% 50% 53%
- **Washington to New York Air-Rail Market**
  - 37% 45% 56% 50% 50% 51% 55% 56% 63% 61% 69%

- MOW equipment on the North End of the NEC
NEC Stair-Steps to HSR Vision

- Next Gen HSR to Boston
- Next Gen HSR North to Hartford
- Next Gen HSR South to Wash D.C.
- NEC Gateway – Newark - NYC
- 160 mph Service south of NYC
- Acela II Doubles HSR Fleet Capacity
- 35% Increase in Acela Capacity
The NEC of the future

• The NEC Master Plan published in 2010
  – Collaborative process with states, commuters, and freight
  – Designed to expand existing network and feeders to accommodate (by 2030):
    - 59% growth in total passenger ridership
    - 41% growth in total passenger trains
    - Increases in speed on existing ROW to 160 mph for Acela

• This is a good plan, but:
  – Essentially improvements on existing alignments
  – Projected growth will “max out” capacity by 2030
  – Total cost (thru 2030) exceeds $50B
### Amtrak’s Next Generation HSR Feasibility Study

#### Route: Stations Served:

<table>
<thead>
<tr>
<th>Route</th>
<th>Stations Served</th>
</tr>
</thead>
</table>
| **Super Express** (4 stops)   | • Boston  
• New York  
• Philadelphia  
• Washington (via Next-Gen alignment) |
| **Standard Express** (18 stops, A/B stop pattern) | As above, other stops will include:  
• Hartford  
• Danbury  
• Newark  
• Wilmington  
• Baltimore (via Next-Gen alignment) |
| **Shoreline Express** (11 stops) | Boston – New York (via NEC alignment)  
(serving:  
• Providence  
• New Haven  
• Stamford  
Direct service to  
New York – Washington (via Next-Gen alignment) |
| **Keystone Express** (6 stops) | New York – Philadelphia (via Next-Gen alignment)  
Keystone Corridor to Harrisburg |
NEC Master Plan – and the Next Gen HSR Plan

**Projected Ridership**

- **Master Plan**
  - Total cost about $42B ($52B with normalized replacement included)
  - Will basically keep up with growth in demand

- **Next Gen**
  - Total cost (thru 2040) of $117B
  - Will generate $900M operating surplus in 2040

**Projected Trip Times**

<table>
<thead>
<tr>
<th>Route</th>
<th>Existing</th>
<th>Master Plan (2030)</th>
<th>Next-Gen HSR Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>NYC - DC</td>
<td>1:36</td>
<td>2:15</td>
<td>2:42</td>
</tr>
<tr>
<td>NYC - BOS</td>
<td>1:24</td>
<td>3:08</td>
<td>3:35</td>
</tr>
</tbody>
</table>
Why do we need to make these investments?

Comparative Energy Intensities

- Amtrak: 2,398 BTU/passenger mile
- Commuter Rail: 2,656 BTU/passenger mile
- Aviation: 2,995 BTU/passenger mile
- Auto: 3,437 BTU/passenger mile
- Personal Truck: 3,641 BTU/passenger mile
- Transit Bus: 4,348 BTU/passenger mile

Source: US DOE

Passenger capacity per meter of width

- Auto: 200 persons per hour
- Bus: 1,500 persons per hour
- Bus lane (separate): 5,200 persons per hour
- Rail: 9,000 persons per hour

Source: International Union of Railways
Beginning the process

• We have a vision – but vision needs to be matched to a plan that is:
  – Attainable
  – Affordable
  – Generates returns quickly
  – Provides the public with a useful transportation solution that builds support for the completed project

• Amtrak has identified the first two stages of a plan:
  – NEC Gateway Project
  – New York-Philadelphia segment

• These improvements will provide the NEC with the capacity it needs for a century to come
NEC Gateway

• Keystone of the plan – creating capacity where it’s most needed
  
• Involves major capacity expansion
  – Add extra tracks between Newark and Penn Station
  – Build two new tunnels under the Hudson River
  – Build Moynihan Station
  – Add extra commuter rail capacity at Penn Station

• When commuter services get investment, high speed services get operational fluidity
New York-Philadelphia dedicated HSR Line

- The “minimum operable segment” concept:
  - Existing line would be improved to raise speeds to 160 mph (short term)
  - Separate HSR line could be built to provide dedicated 220mph express service (mid- to long term)

- Each improvement will generate
  - Initial rounds of improvement will greatly increase capacity
  - Subsequent rounds will increase speed, provide jumping-off point for later rounds of HSR construction
What do we need?

• A solution for the future – not a strategy from the past

• Capacity for growth

• An infrastructure improvement that will last for a century

• A strategy that will safeguard our mobility and conserve oil

• Rail is the progressive, high-tech, energy-efficient solution for tomorrow