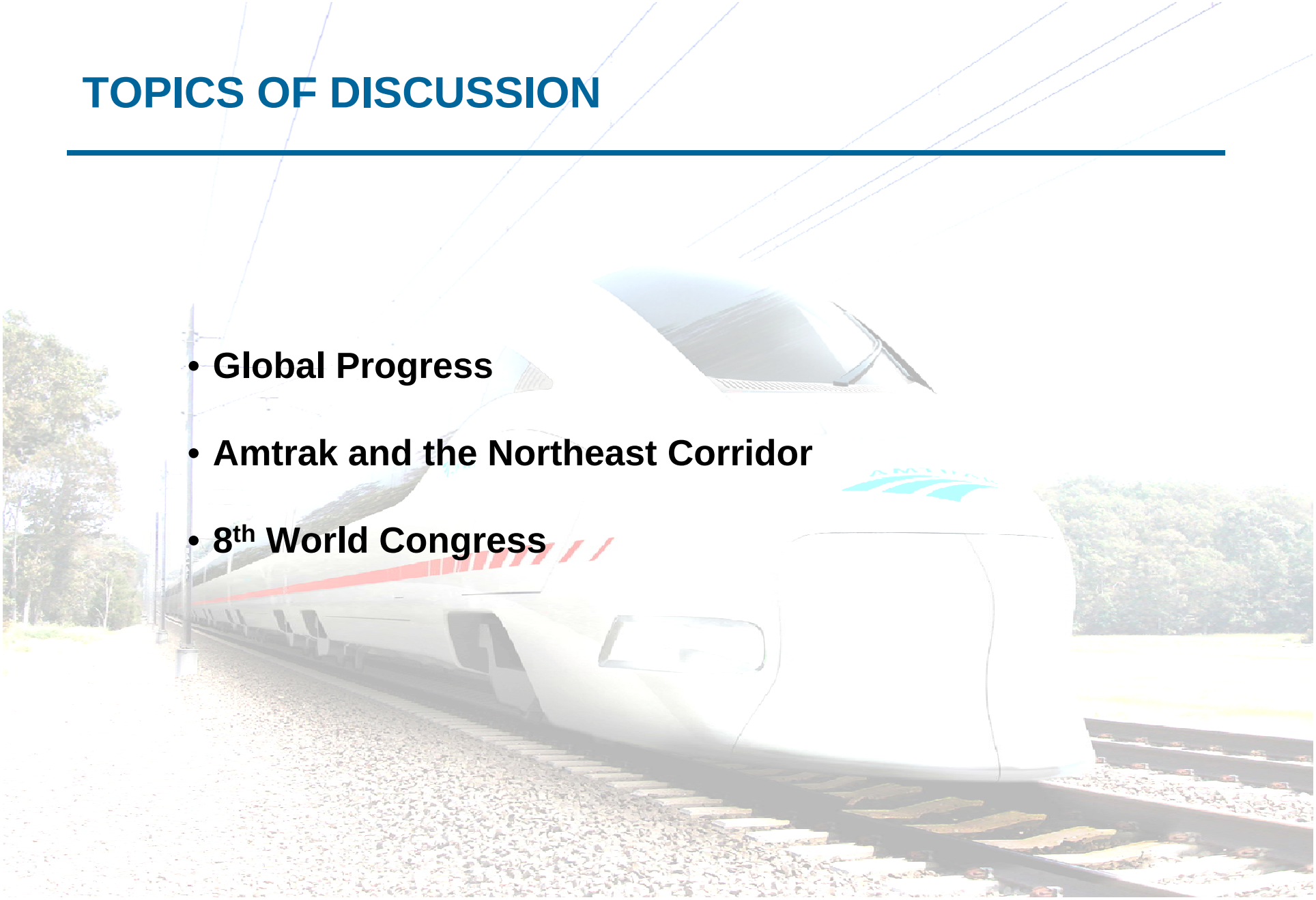
High Speed Rail
Global Progress and Amtrak Update

Al Engel
Vice President - High Speed Rail, Amtrak
The Rail Ahead
Las Vegas, November 3, 2011

TOPICS OF DISCUSSION



- **Global Progress**
- **Amtrak and the Northeast Corridor**
- **8th World Congress**

Definition: High Speed Rail Thresholds

Operating at more than (+/-) 125 mph requires:

- special trains (train sets)

- special dedicated lines

- cab signalling

…and much more

USDOT Definitions

Core Express – Connect large urban areas up to 500 miles apart within 2-3 hours on electrified, dedicated track (125-250+ mph)

Regional – Connect mid-sized urban areas up to 500 miles apart with service on dedicated and shared track (90-125mph)

Emerging – Connect smaller communities with service on shared track (up to 90mph)

Understanding High Speed Rail

A very complex system, comprising state-of-the-art:

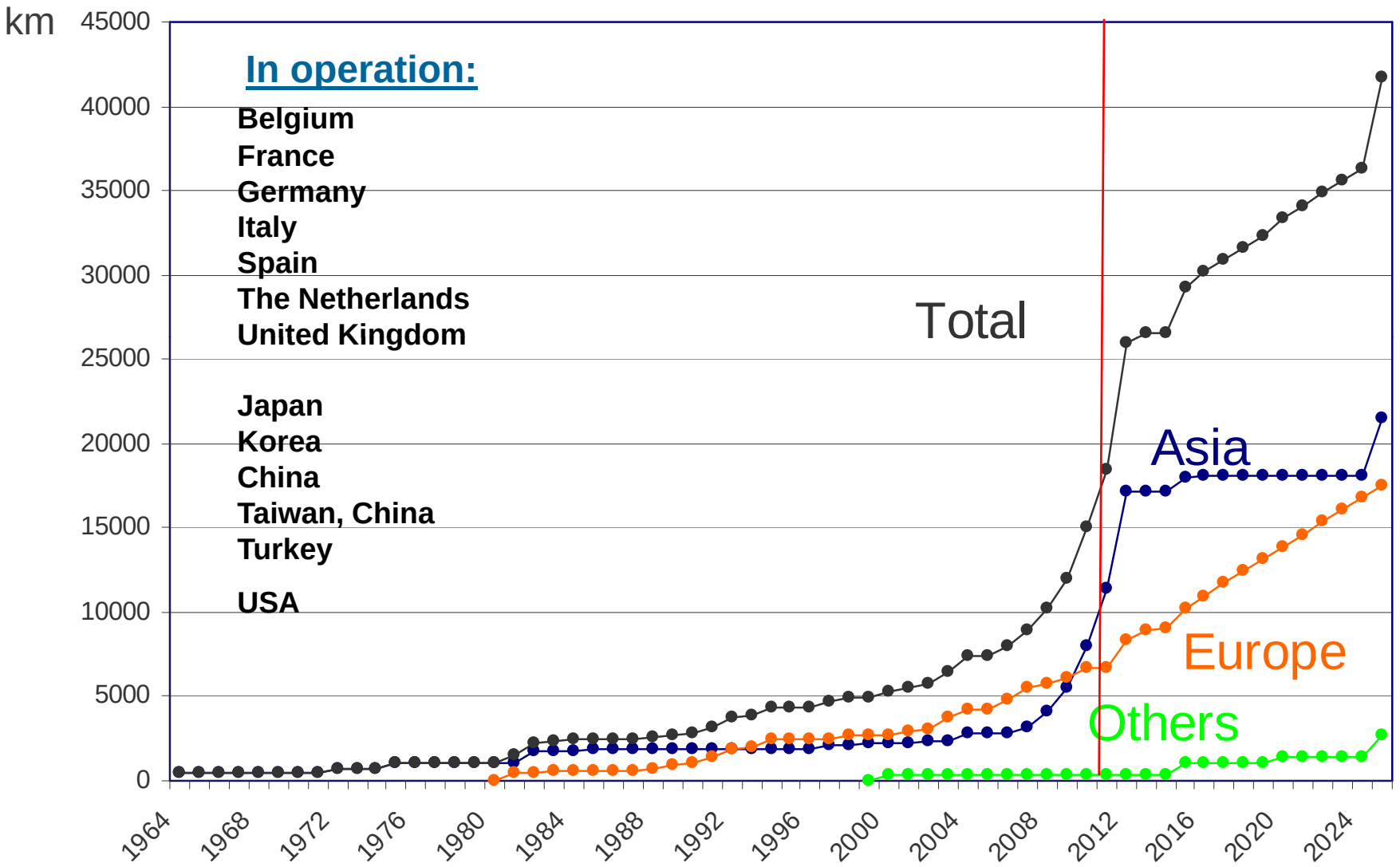
- Infrastructure
- Rolling stock
- Signaling systems
- Maintenance systems
- Management
- …
- Station emplacement
- Operations rules
- Marketing
- Financing
- Legal issues

Considering all of them is fundamental

High Speed Rail Advantages for Society

- **Offers a high <u>capacity</u> of transport**
  - **Up to 400,000 passengers per day, Tokyo – Osaka**
  - **Permits reducing traffic congestion**
  - **Helps economic development**
  - **Shapes land-use**
- **Offers <u>sustainability</u>**

Evolution of the World HS Network



Global rolling stock high speed fleet

High speed train sets* in operation in the world:

Maximum speed 200 km/h or more: 2.575

Maximum speed 250 km/h or more : 2.088

High speed train sets in production: 1.083

* and trains operating on dedicated high speed lines

July 2011

HSR Miles in Operation Exceeds 10,500 Miles

TABLE 1
High-Speed Rail in Operation and Under Construction Worldwide

	In Operation				Under Construction			Total		
Country	First year of operation	Miles	Percent of Total	Top Speed (mph)	Miles	Percent of Total	Top Speed (mph)	Miles	Percent of Total	Annual Ridership
China	2003	3,914	37.2	220	2,696	55.9	220	6,610	43.1	290,540,000
Japan	1964	1,655	15.7	190	235	4.9	230	1,890	12.3	288,836,000
Spain	1992	1,278	12.2	190	1,098	22.7	190	2,376	15.5	28,751,000
France	1981	1,178	11.2	200	130	2.7	200	1,309	8.5	114,395,000
Germany	1991	798	7.6	190	235	4.9	190	1,033	6.7	73,709,000
Italy	1981	574	5.5	190	—		—	574	3.7	33,377,000
South Korea	2004	256	2.4	190	116	2.4	190	372	2.4	37,477,000
USA	2000	362	2.1	150	—		—	362	1.5	3,200,000
Taiwan	2007	214	2.0	190	—		—	214	1.4	32,349,000
Turkey	2009	146	1.4	160	317	6.6	160	463	3.0	942,000
Belgium	1997	130	1.2	190	—		—	130	0.8	9,561,000
The Netherlands	2009	75	0.7	190	—		—	75	0.5	6,005,000
United Kingdom	2003	70	0.7	190	—		—	70	0.5	9,220,000
World Total	—	10,513	100.0	—	4,827	100.0	—	15,340	100.0	928,362,000

Notes: Data is sorted by miles in operation. China's annual ridership is an estimate based on various news reports. USA's annual ridership reflects FY 2010 ridership on Amtrak's Acela Express service on the Northeast Corridor.

Source: UIC (2011; 2009).

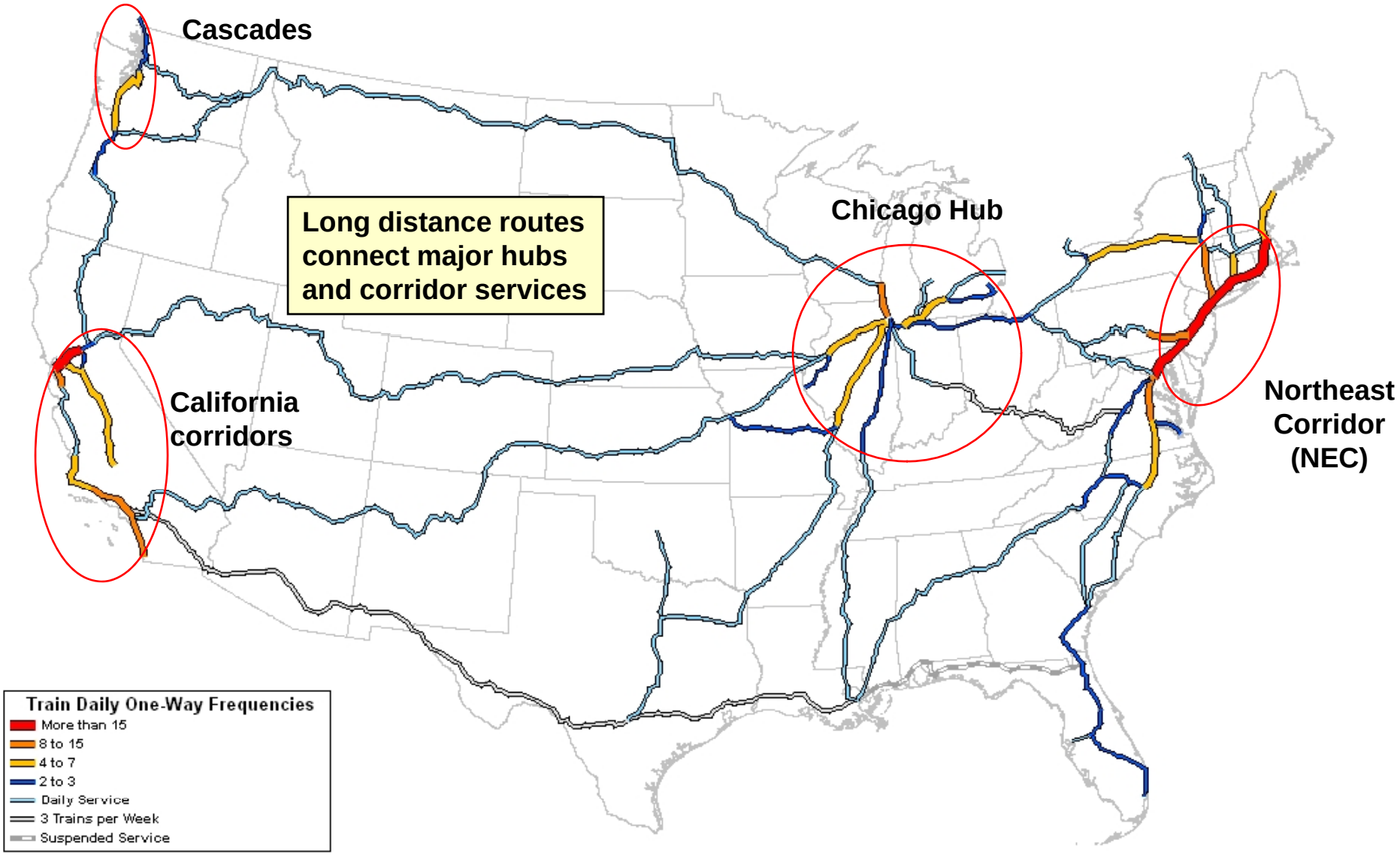
Our Panelists

- **Masaki OGATA, Vice Chairman – Eastern Japan Railway**
- **Julien DEHORNOY, Senior Advisor, Strategy and Finances – SNCF Group**
- **Eduardo ROMO, President - Railways Research Foundation in Spain**

Amtrak – We Improve the Quality of Life for Many People

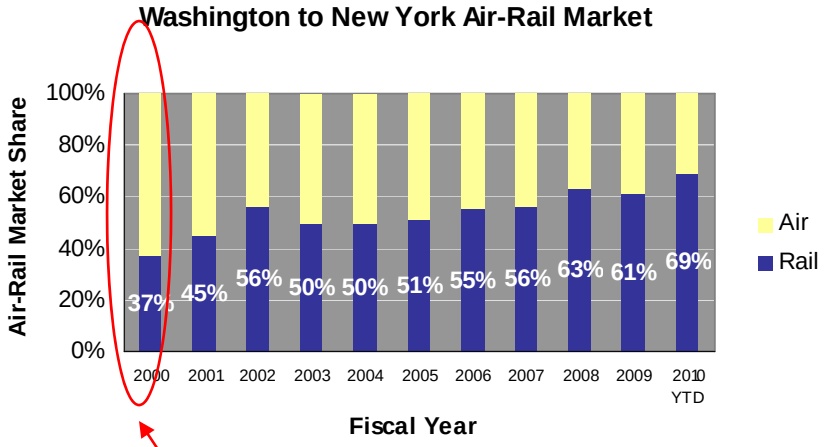
- **National railroad: May 1,1971 Congressionally chartered corporation**
- **20,000 employees operate a 21,100 mile system**
  - 310 daily intercity trains using 528 stations [70% of our train-miles run on freight tracks]
  - 1,519 cars and 469 locomotives, 80 auto carriers, and 101 baggage cars
  - 60% of trains operate at top speeds in excess of 90 mph (145 kph)
- **The *Acela Express* is the fastest train in the Western Hemisphere, with a max. speed of 150 mph (241kph) and recovers 169% of operating expense**
- **Amtrak operates 27 million of its train miles (over 70%) over host railroads**
  - **six largest host railroads are:**
    - **BNSF** 6.8 M, **Union Pacific** 6.19 M, **CSX** 5.90 M, **NS** 2.49 M, **CN** 1.46 M,
    - **Metro North** 1.34 M
- **Amtrak generated total of $2.51 billion in revenues in FY 10 (incl. ancillary business).** Federal funding for Amtrak slightly less than $1.6 billion in FY 10
  - **8 of 9 years of growth; 30 million passengers in FY2011 – a new record!**

We operate in 46 of the lower 48 states……

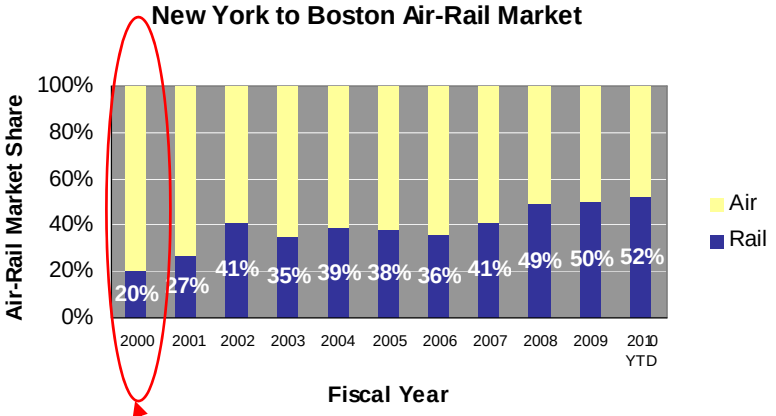


NEC Rail Captures Larger Share

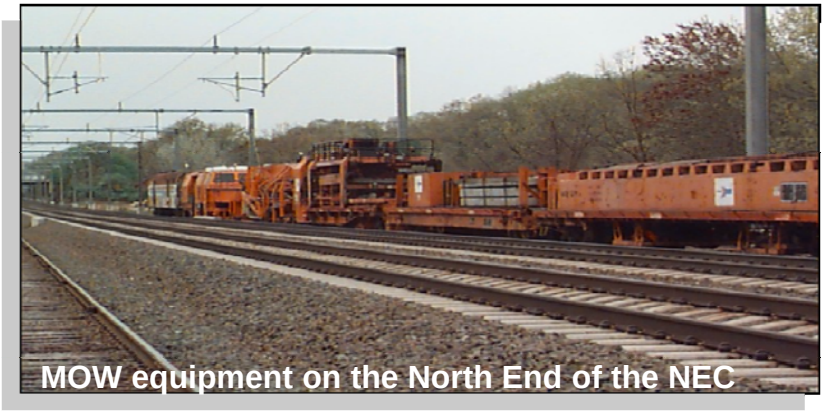
- **We're operating a vital transportation link that can touch 150 mph – but the challenges are mounting**
- **We're also running out of capacity – but demand continues to grow**
- ***How do we solve these problems – and how do we grow?***



***Acela* service introduced – 86% growth in South End ridership between FY 2000 and FY 2010**

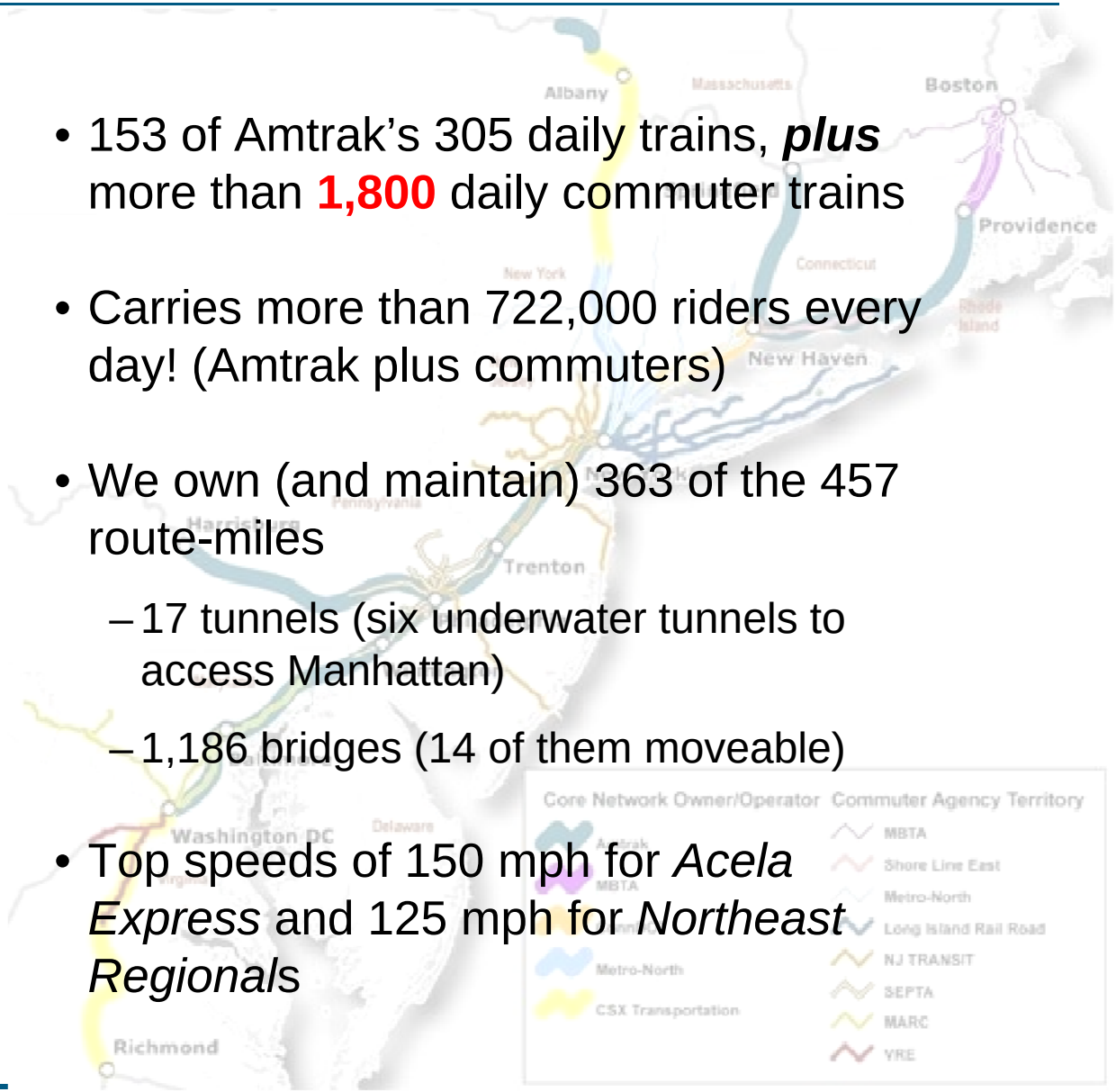


***Acela* service, electrification, and 125 mph Regional service introduced – 160% growth in North End ridership between FY 2000 and FY 2010**

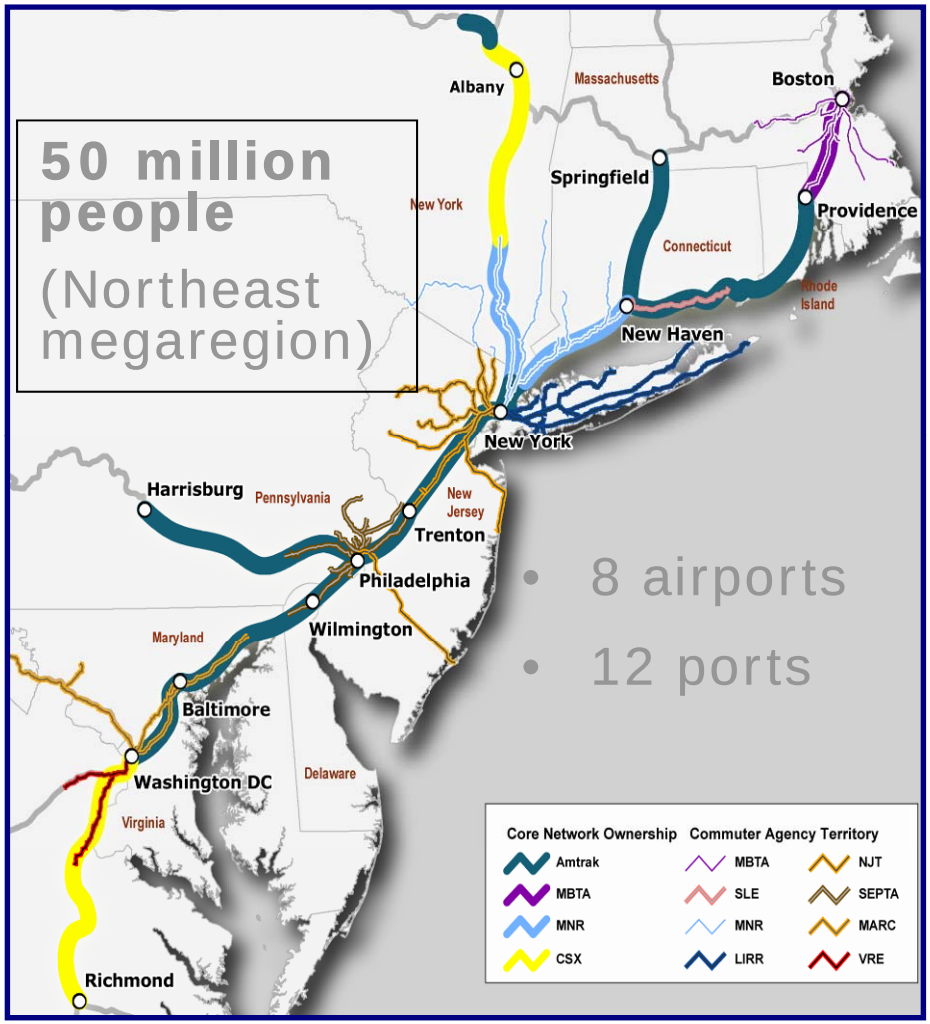

MOW equipment on the North End of the NEC

Amtrak's Northeast Corridor – A Complex Operation

- 153 of Amtrak's 305 daily trains, ***plus*** more than **1,800** daily commuter trains
- Carries more than 722,000 riders every day! (Amtrak plus commuters)
- We own (and maintain) 363 of the 457 route-miles
  - 17 tunnels (six underwater tunnels to access Manhattan)
  - 1,186 bridges (14 of them moveable)
- Top speeds of 150 mph for *Acela Express* and 125 mph for *Northeast Regionals*

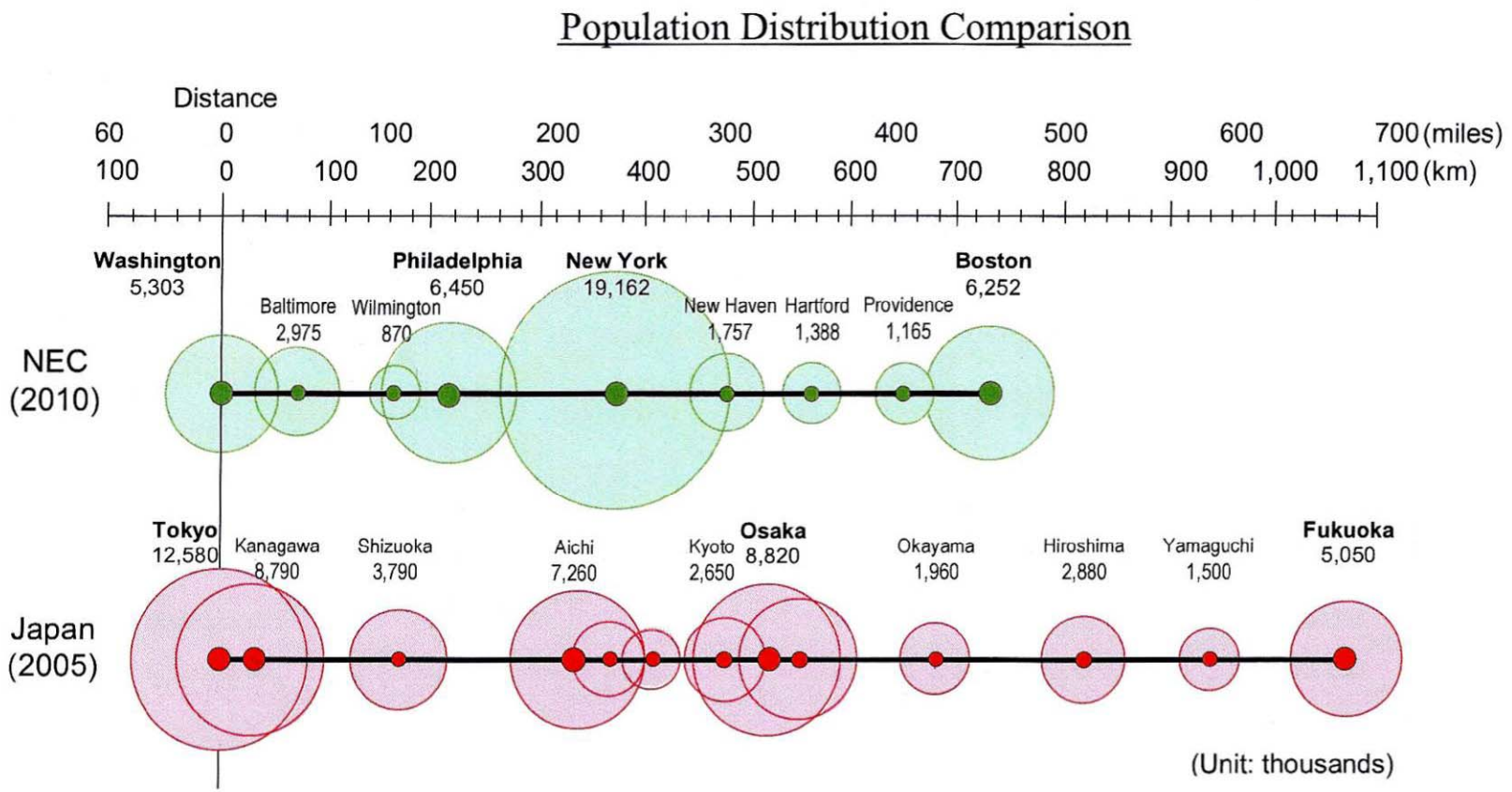


Northeast Corridor and HSR - Regional Overview



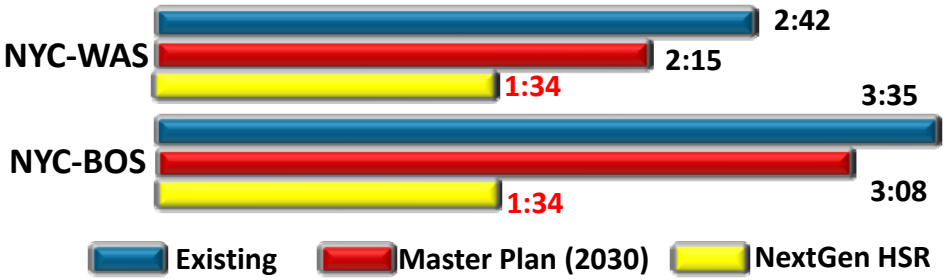
- 2nd largest mega-region in the world
- Economic and political capital of the Americas
- 20% of US GDP
- Population density =/> Europe and 12 times US average
- 1400 route miles 12 states, DC
- 8 commuter operators
- Class 1 and regional freight
- Amtrak high speed, regional, long-distance

NEC Compares Favorably to Most Successful HSR Corridor



NEC NextGen HSR: Reduced Trip Time – Surge in Capacity

- **World-Class High-Speed Network:**
  - Dedicated 2 - track alignment; 220 mph equipment
  - 40% - 60% travel-time reductions in key markets
  - Boston – Washington DC: from 6:30 to 3:20



Service Departures (Each Direction)

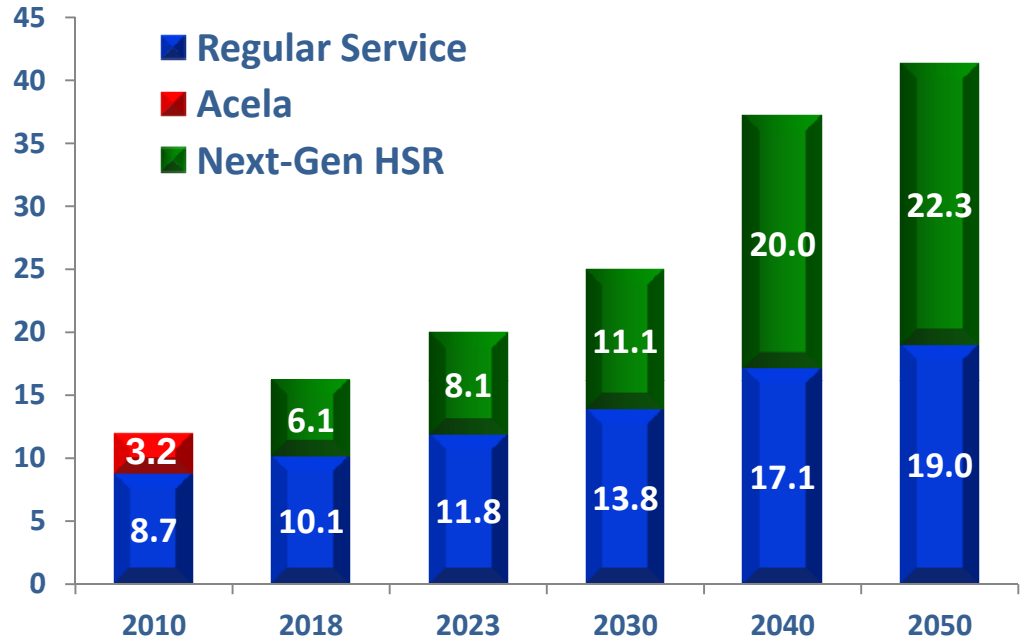
	Current	Next-Gen HSR
Hourly	1	3-4
Daily	10-15	53-73

Average Speeds (Super Express)

	Current	Next-Gen HSR
NYC - BOS	65 mph	148 mph
NYC - DC	86 mph	137 mph

NEC NextGen HSR: Significant Growth in Ridership

Total NEC Ridership by Service in Milestone Years: 2010 - 2050

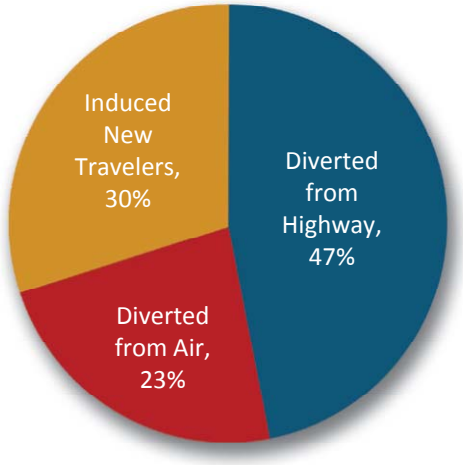


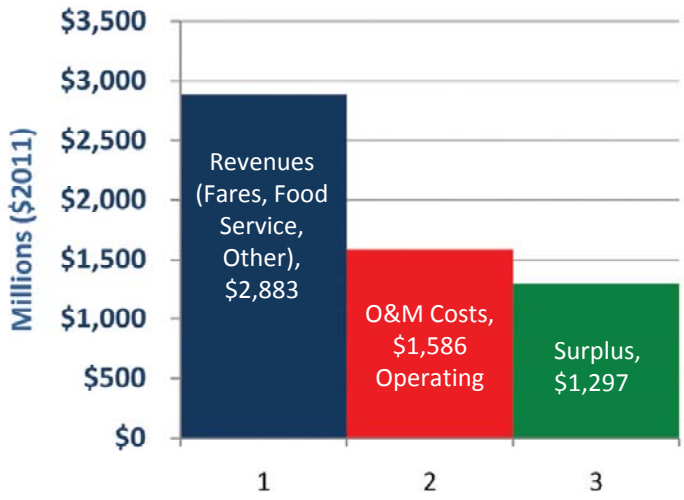
- **Increase in ridership under Master Plan vs. NextGen:**

2018	2023	2030	2040	2050
47%	50%	66%	198%	232%

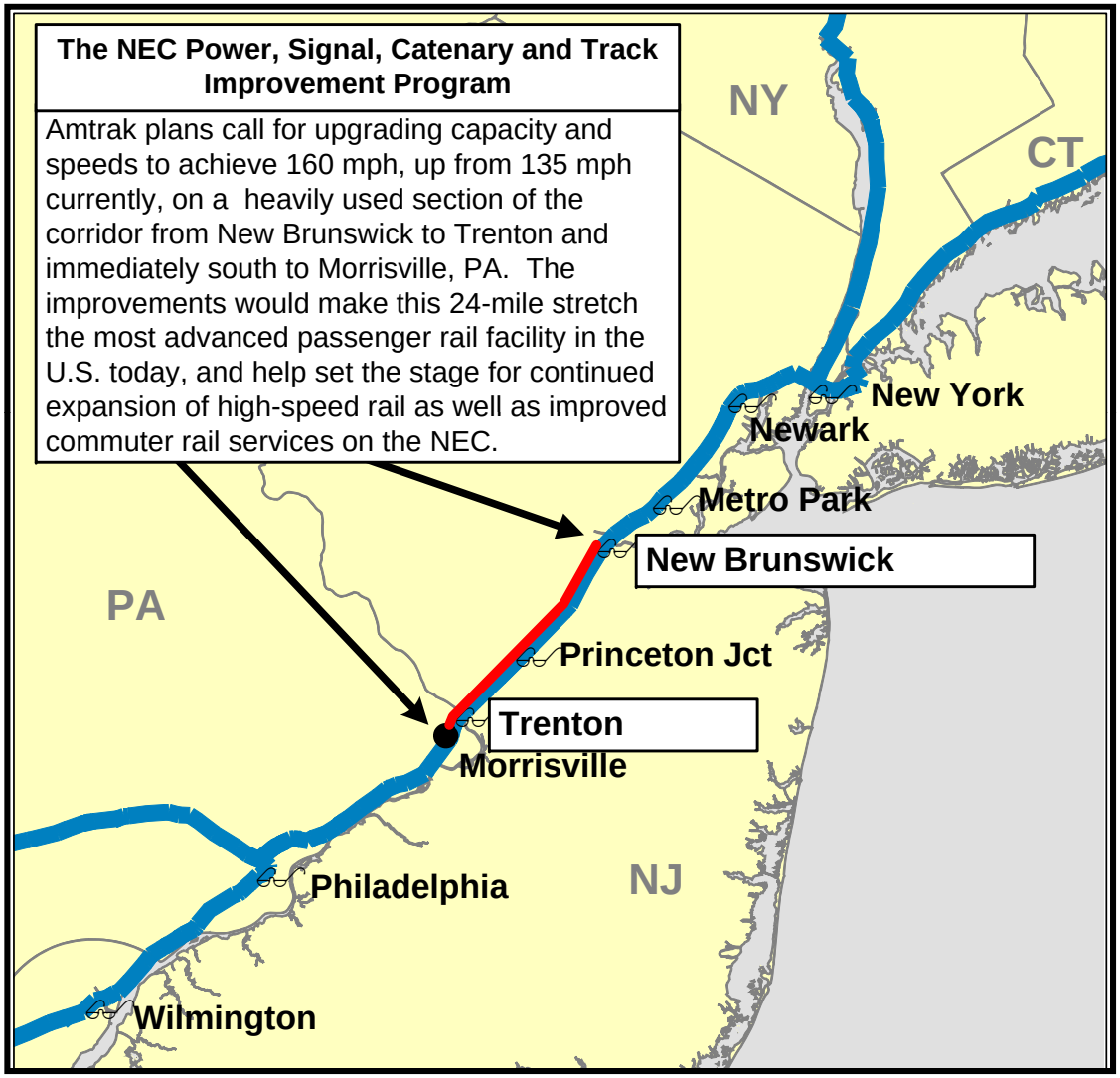
NEC NextGen HSR: Operating Surplus of $1.3 Billion

- **NextGen HSR operations generates $1.297 billion annual surplus**
- **Costs Include:**
  - O&M costs
  - Capital Renewal (infrastructure & rolling stock): long-term equipment & capital repair
- **Employment Opportunities:**
  - 44,000 full-time jobs annually over a 25 year for construction
  - 120,000 permanent jobs
  - 7,100 new rail operations jobs
- **Investment: $116.47 billion**
  - Benefit/Cost multiplier: 2.27

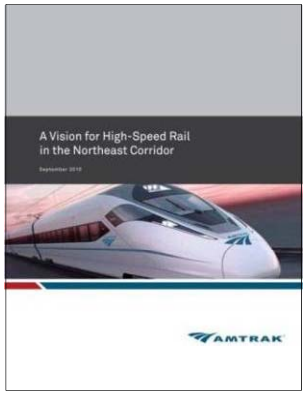




NEC High Speed Rail Improvements --$450 million award



Implementation Phasing Strategy



NextGen HSR: NYC to BOS

NextGen HSR: NYC to Hartford

NextGen HSR: PHL to WAS

NextGen HSR IOS: NYC to PHL

NextGen HSR 220 MPH MAS

NEC Gateway: Newark to NYC

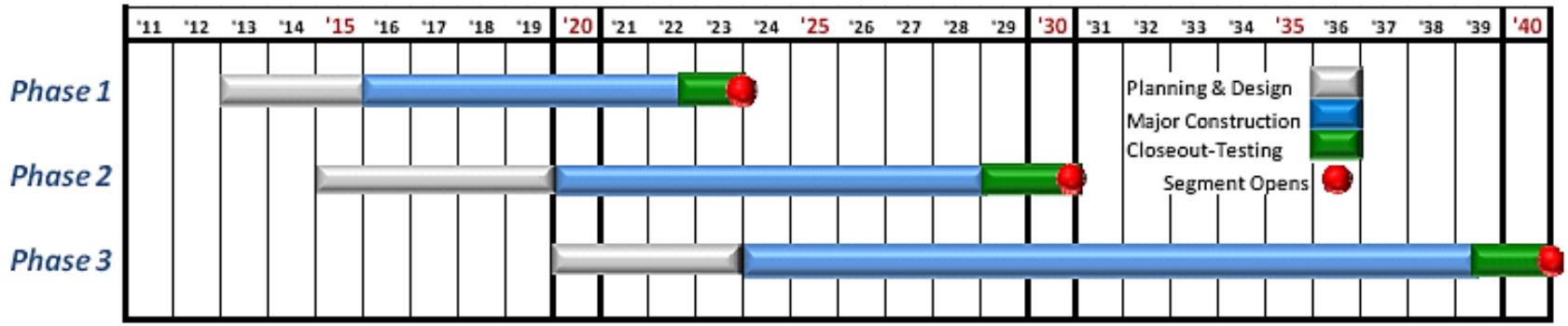
NEC 160 mph MAS: NYC to WAS

Acela II Fleet Doubles Capacity

Acela Capacity Increases 40%

NEC-UP (Upgrade Program) 160 MPH MAS

Implementation Phasing Strategy – Program Timeline



- Two New Dedicated Tracks: NYC - PHL
- New Stations & Infra: NYC - PHL

3 NextGen HSR IOS NYC- PHL

NextGen NYC - WAS

- Two New Dedicated Tracks: NYC - WAS
- New Stations & Infra: NYC - WAS

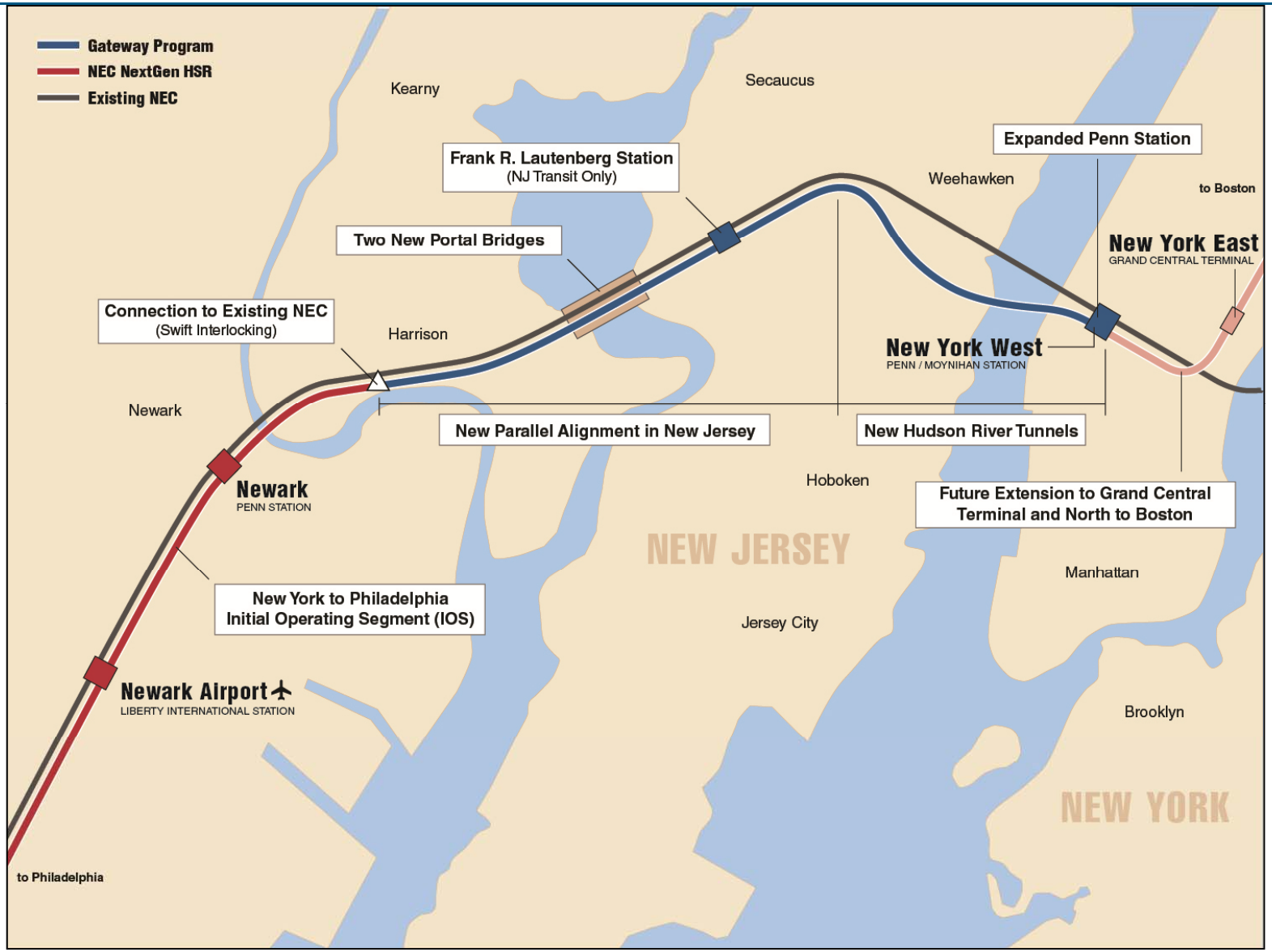
- Two New Dedicated Tracks: NYC - BOS
- New Stations: NYC East (GCT) - BOS
- New Infrastructure: NYC - BOS

NextGen NYC - BOS

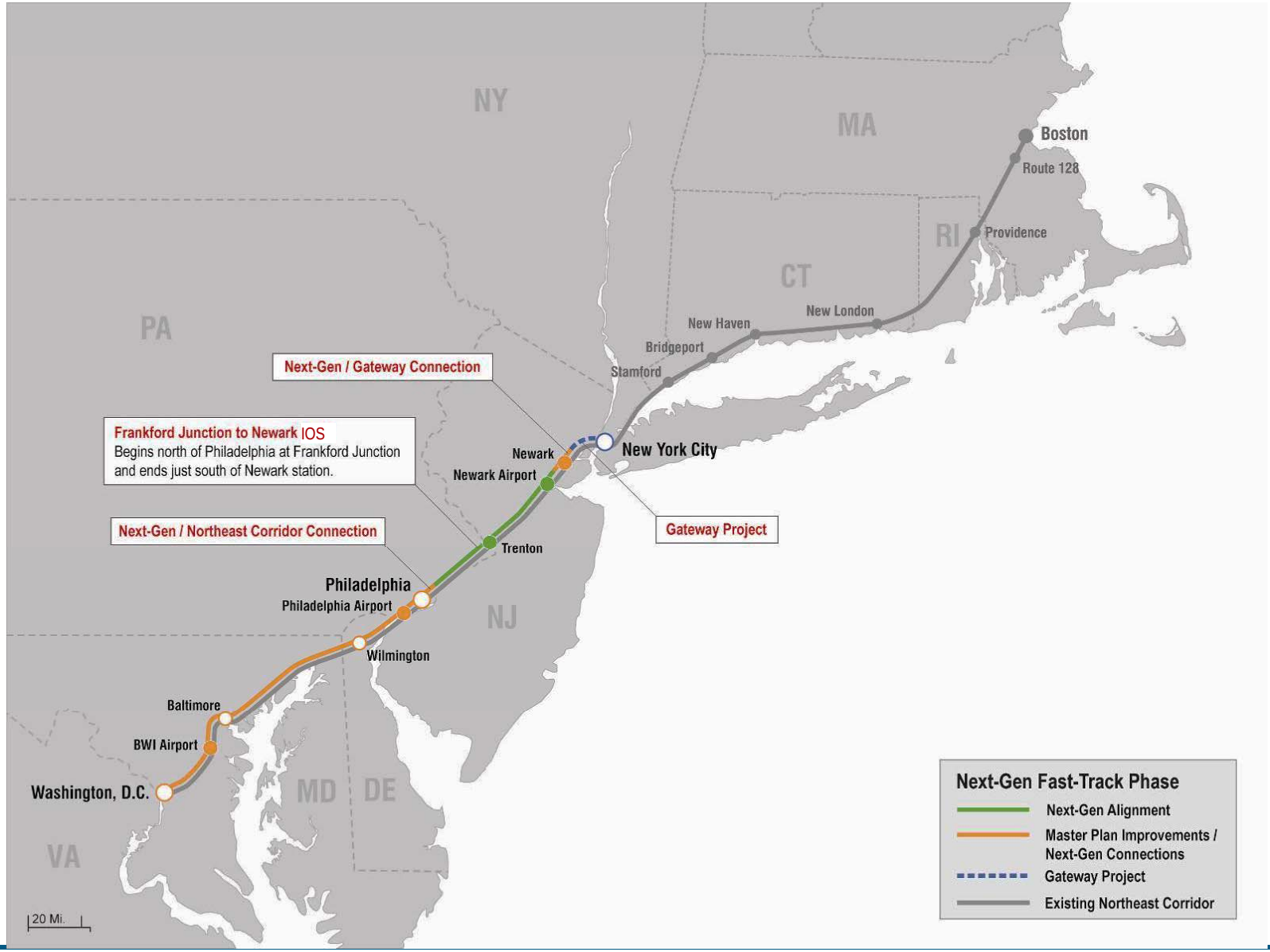
BOS – NYC – WAS
3:20 Trip Time

*** NEC Next-Gen HSR alignment contingent upon NEC PEIS**

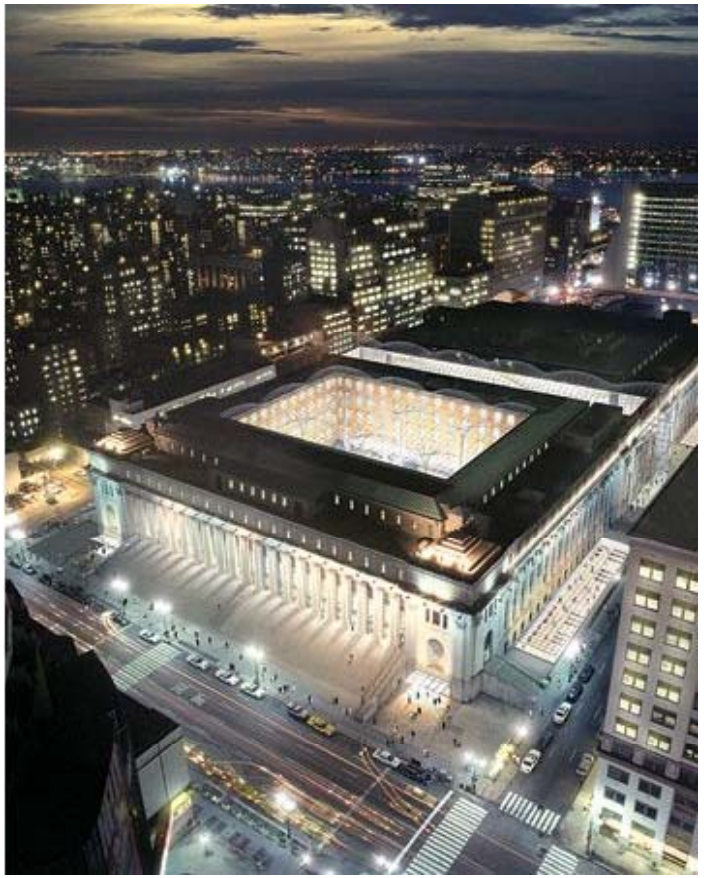
Gateway Program – Newark to New York



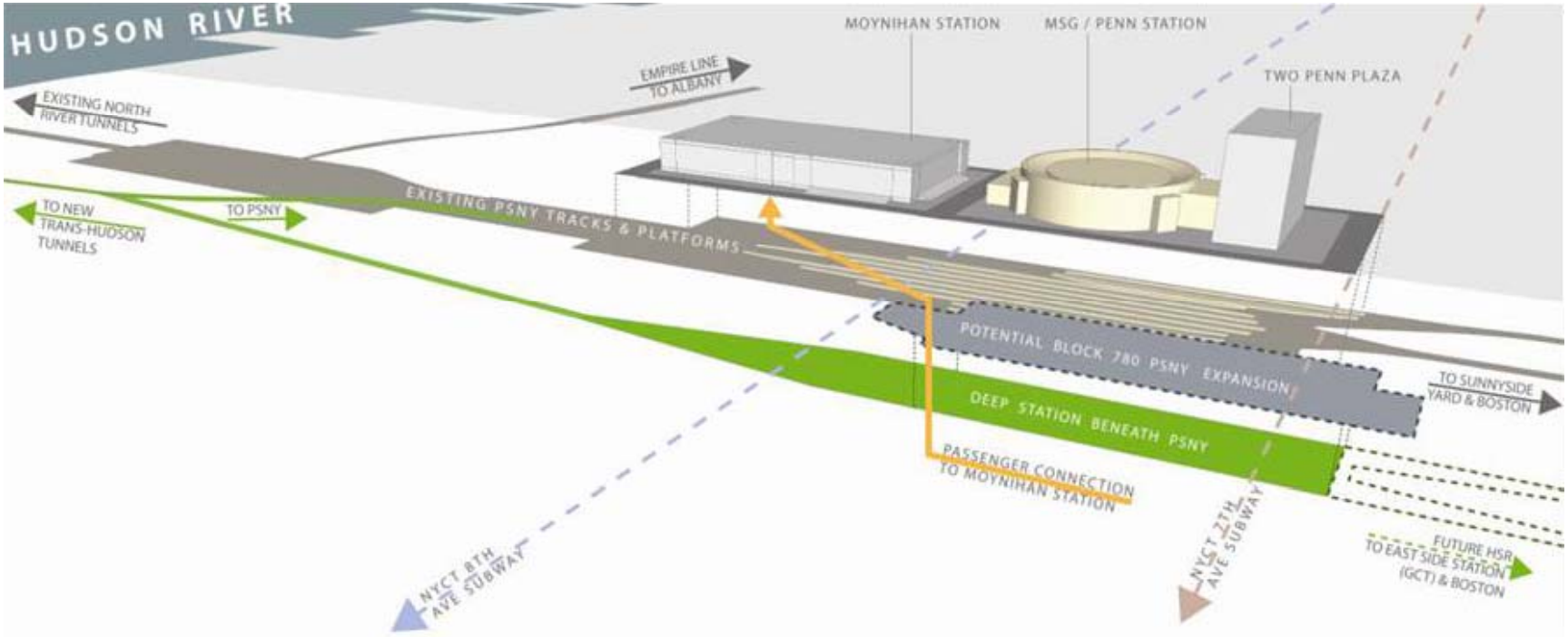
NextGen HSR Initial Operating Segment (IOS) NYC – PHL (2023)



Gateway Project – Expanded Moynihan/Penn Station



Deep Level Station Under Penn/Moynihan Station



UIC 8th World Congress on HSR – Philadelphia 2012

PHILADELPHIA 2012 HIGHSPEED
8th World Congress on High Speed Rail
www.uic.org | www.uic-highspeed2012.com

- **Amtrak to host UIC 8th World Congress on High-Speed Rail in Philadelphia**
- **Partner with American Public Transportation Association (APTA) and American Association of Railroads (AAR)**
- **Expect 2,000 worldwide attendees to exchange views on development and achievements of high-speed rail**
- **Trade exhibitions, technical tours and networking activities for 3-days**
- **Pennsylvania Convention Center, Philadelphia, PA - July 10th–13th, 2012**

Thank you for your kind attention

Al Engel
Vice President High Speed Rail, Amtrak, U.S.A.

al.engel@amtrak.com