Opportunities for High Speed and Intercity Passenger Rail Development
Midwest Projects
Northeast Corridor (NEC) current & next generation

Mike Franke, P.E.

Assistant V.P., Amtrak Policy & Development

Basic facts about Amtrak

- **Chartered by Congress as national intercity passenger railroad; opened for business on May 1, 1971**
- **20,000 employees operate a 21,100 mile system**
- 60% of trains operate at top speeds in excess of 90 mph (145 kph)
- **The *Acela Express* is the fastest train in North America**
  - **Top speed of 150 mph (241kph)**
  - **Recovered 141% of operating expense in FY10**
- **Amtrak covers about 76% of operating costs with ticket revenue; total revenue covers 85% of operating costs**

Amtrak services

Northeast Corridor (NEC)

- 150 mph *Acela* and 125 mph Regional services
- Links New York, Boston, and Washington (electrified)
- 457 mi route, 153 of 308 daily Amtrak trains operate on some portion of the NEC
- Positive train control system in use

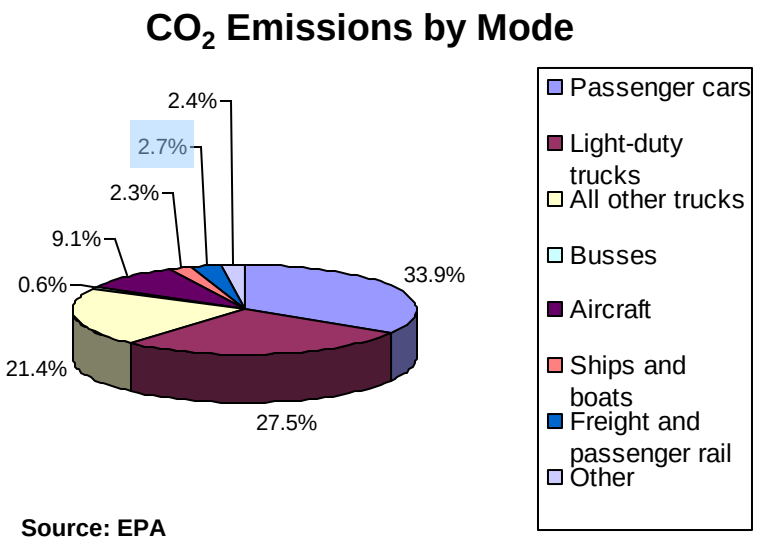
Short distance trains/corridors (86-750 mi)

- Services range from 59 mph operations in unsignaled territory up to 110 mph w/automatic train stop and/or cab signals
- 2-32 daily trains, depending on route (most diesel)
- 15 states provide operating support for Amtrak services

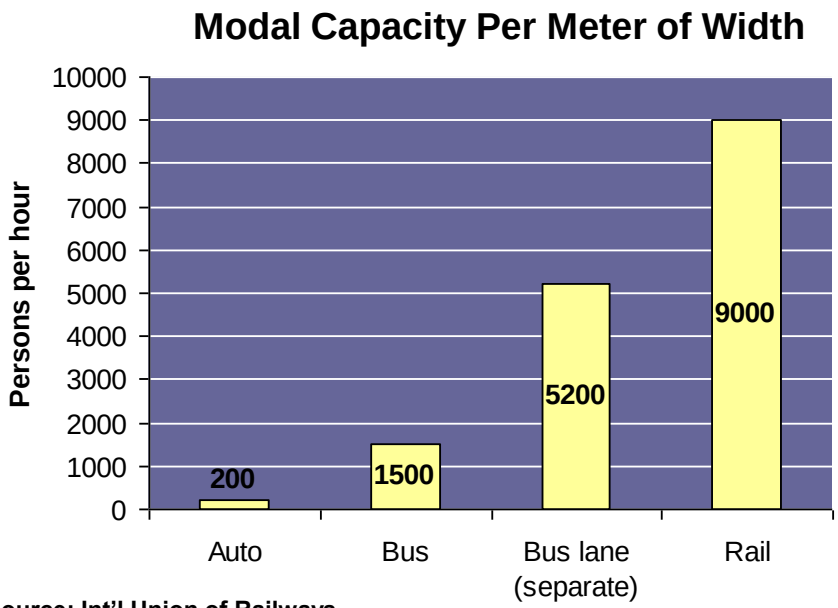
Long Distance Trains (up to 2,438 mi)

- Fifteen trains, most daily (two tri-weekly trains)
- Most include sleeping and dining car service
- 1 train in each direction, diesel-powered for most or all of route

What role can passenger rail play?



Source: EPA



Source: Int'l Union of Railways

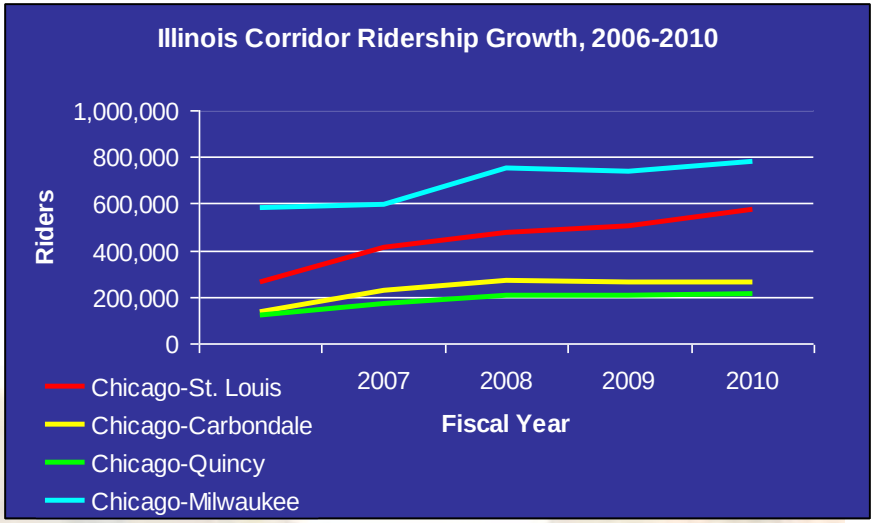
- Rail is inherently:
  - Energy-efficient
  - Clean
  - Scalable
- Can access city centers on existing rights-of-way
- Provides an affordable means of capacity expansion

Amtrak Midwestern Operations

- Chicago Union Station is the hub for Midwestern services
  - Served by 56 daily Amtrak trains, plus Metra
  - Frequency varies
    - *Cardinal* operates 3 times a week
    - *Hiawatha* has 7 daily departures
- State of Illinois supports 3 services
  - *Lincoln Service,* Chicago-St. Louis (4 daily round trips)
  - *Illini/Saluki,* Chicago-Carbondale (2 daily round trips)
  - *Illinois Zephyr/Carl Sandburg,* Chicago-Quincy (2 daily round trips)
- FRA's High Speed and Intercity Passenger Rail (HSIPR) Grant program has made significant funding available for several routes

Amtrak in Illinois, 2006-2010

Daily Departures	2006	2007	2008	2009	2010
Chicago-St. Louis	3	5	5	5	5
Chicago-Carbondale	2	3	3	3	3
Chicago-Quincy	1	2	2	2	2



- Major service change on 3 downstate routes, November 2006
  - General Assembly doubled Illinois DOT Amtrak funding
  - Corridor trains added to all three downstate routes, national network service by overnight trains maintained as a foundation
  - Illinois shares *Hiawatha Service* cost with Wisconsin (25% Ill./75% Wisc.)
- These are successful state services that would be enhanced by new service to the Quad Cities & Rockford/Dubuque in the next two years

Other Midwestern State Partners

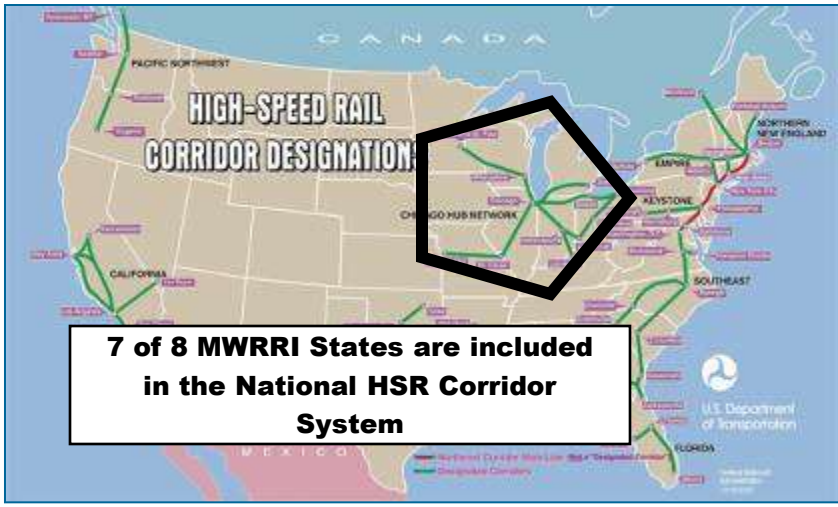
- Wisconsin – one state-supported, one National Network route
  - *Hiawatha,* Milwaukee-Chicago (7/6 state-supported round-trips)
  - *Empire Builder,* Chicago-Seattle/Portland (station upgrades)
- Michigan – two state-supported, one National Network route
  - *Pere Marquette,* Grand Rapids-Chicago (1 state-supported round-trip)
  - *Blue Water,* Port Huron-Lansing-Chicago (1 state-supported round-trip)
  - *Wolverines,* Pontiac/Detroit-Ann Arbor-Chicago (capital improvements)
- Missouri – one state-supported, two National Network routes
  - *Missouri River Runner,* St. Louis-Kansas City (2 state-supported round trips)
  - *Texas Eagle*, Chicago-San Antonio/Los Angeles (station upgrades)
  - *Southwest Chief*, Chicago-Los Angeles (station upgrades)

Other Midwestern State Partners

- Iowa – one planned state-supported, two National Network routes
  - Iowa City/Des Moines extension from Illinois Quad Cities (pending)
  - *Southwest Chief*, Chicago-Los Angeles (station upgrades)
  - *California Zephyr*, Chicago-San Francisco Bay (capital improvements)
- Texas – one state-supported, one National Network route
  - *Heartland Flyer*, Fort Worth-Oklahoma City (1 state-supported round-trip)
  - *Texas Eagle,* Chicago-San Antonio/Los Angeles (station upgrades)
  - *Sunset Limited*, Los Angeles-New Orleans (station upgrades)
- Oklahoma – one state-supported route
  - *Heartland Flyer*, Oklahoma City-Fort Worth (1 state-supported round-trip)

The Midwest Regional Rail Initiative

- Implement improvements on a regional basis to gain efficiencies and economies of scale that are not available to individual states
- Use of 3,000 miles of existing freight rail and commuter rights-of-way to connect rural, small urban, and major metropolitan areas
- Operation of a “hub-and-spoke” system providing service to and through Chicago to locations throughout the Midwest
- Introduction of state-of-the-art train equipment operating at speeds up to 110 mph
  - WiFi access
  - Food service
  - Power outlets at each seat
- In addition to current routes, provide rail service to Midwest areas not presently served by passenger rail
- Dedicated network of feeder bus service
- Modernized stations and facilities

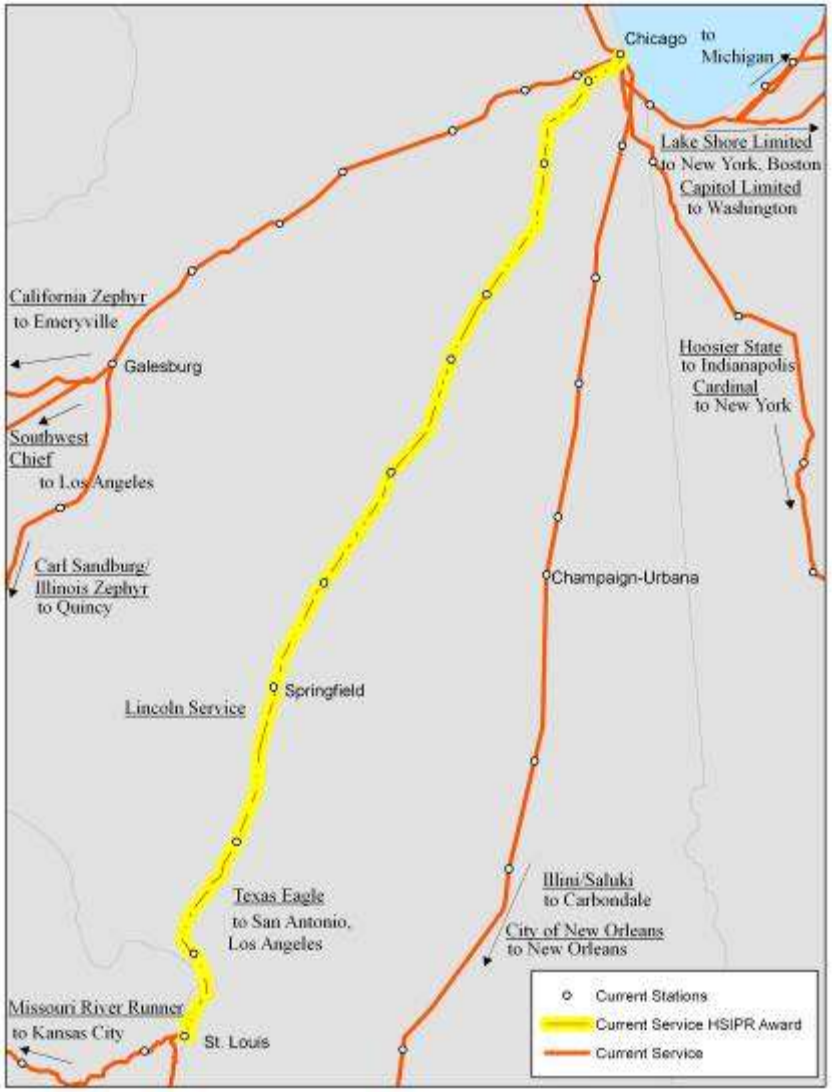


7 of 8 MWRRI States are included in the National HSR Corridor System

Latest round of HSIPR grants

- Announced on May 9, 2011
  - More than $2.02 billion
  - 22 projects in 15 states
- $404M to expand service in the Midwest
  - $186.3M will go to improve the Chicago-St. Louis corridor
    - Previous grants will raise top speed on the St. Louis-Dwight segment to 110mph
    - New grant will make similar improvements on the Dwight-Joliet segment
  - $196.5M will go to improve the Chicago-Detroit-Pontiac corridor
    - Trains can currently operate at 95mph on Amtrak-owned line between Porter, IN and Kalamazoo, MI
    - Funding will allow signal and track improvements needed to raise speeds to 110mph on the 235 mile Porter-Dearborn segment
  - Remaining funds will support environmental, planning, and preliminary engineering work on projects in
    - Michigan
    - Minnesota
    - Missouri

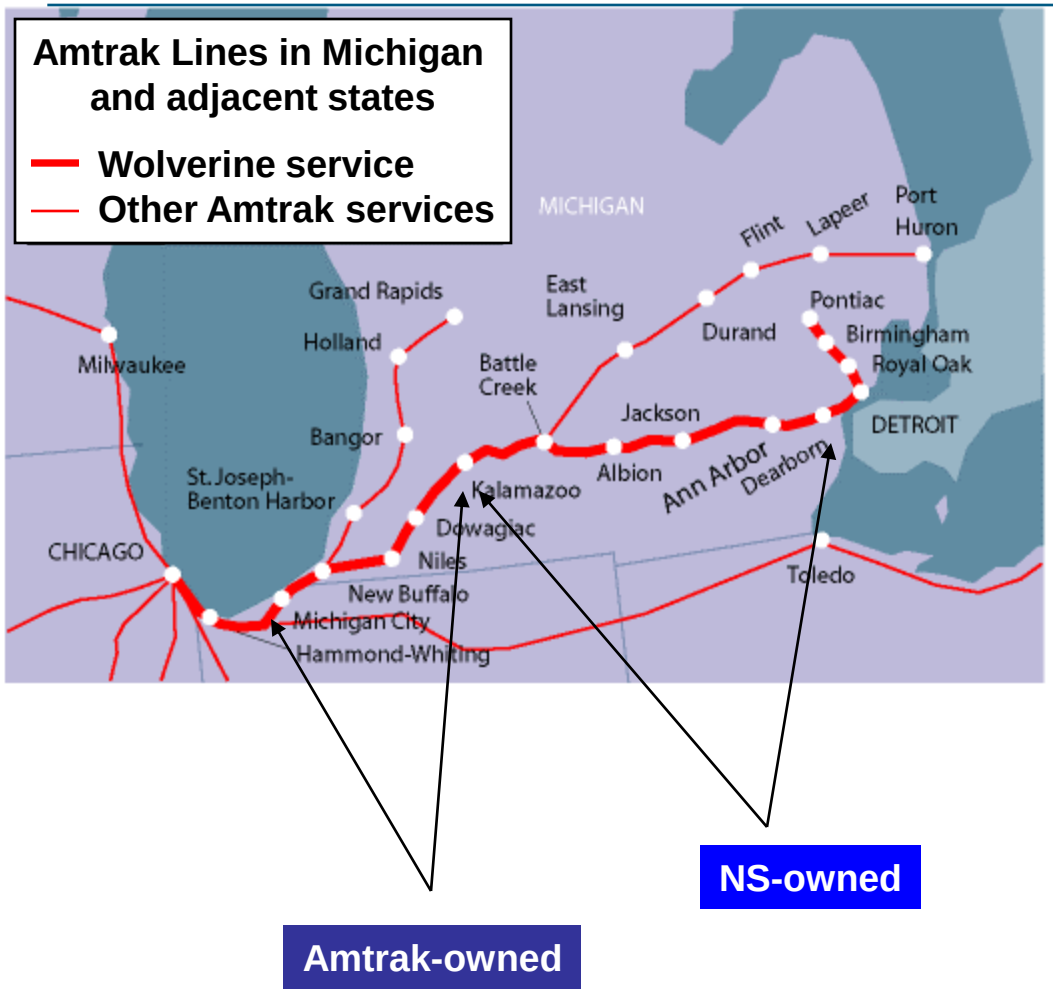
Chicago-St. Louis corridor



- With $1.142 billion, the Illinois grant for the Chicago-St. Louis portion of the corridor will be upgraded to 110 mph by improving tracks, signals, and roadway crossings; also included is the installation of PTC, as well as planning studies for additional service enhancements
- Initial investment will result in faster service by decreasing trip times by more than an hour between end points
- Completion of work contemplated under this grant will set stage for another round of investments to permit an eventual increase to eight round trip frequencies per day on Chicago-St. Louis corridor

Chicago-St. Louis corridor

Amtrak Michigan Line



- Amtrak currently owns 97 miles (Porter-Kalamazoo) of our 304 mile Chicago-Detroit-Pontiac route
- Michigan working to acquire Dearborn-Kalamazoo NS line
- Planned Federal investment in this route (including Chicago-Porter, Indiana and Englewood Flyover) in the vicinity of $600 million
- We have a strong partner in the state of Michigan
  - Since 1990, state has invested about $65M in equipment and infrastructure
  - This is the opportunity of a lifetime

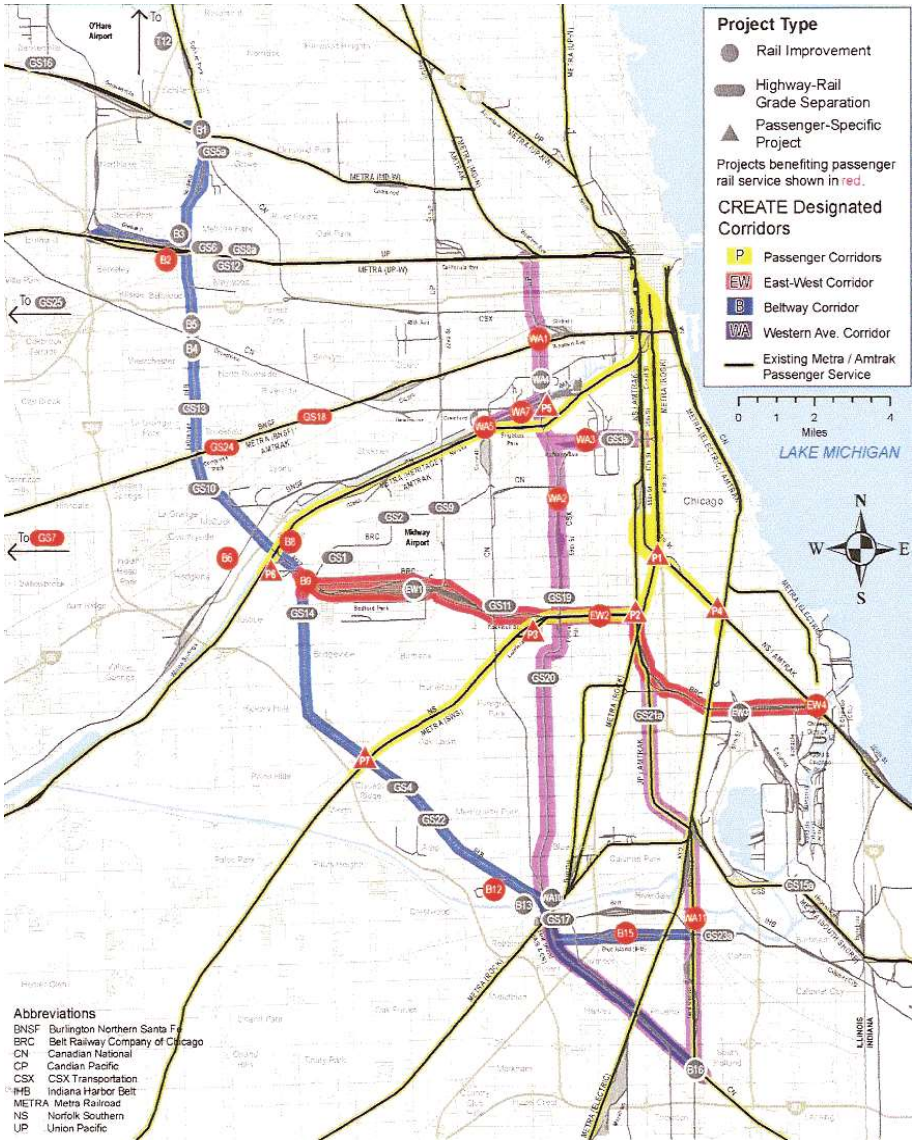
Planned Federal investment in the Michigan Line

- Chicago-Porter, IN (NS-owned) – 8 separate improvements as part of "Indiana Gateway" to relieve congestion and reduce delays ($71M)
- Kalamazoo-Dearborn Line (currently NS-owned) ($346M)
  - Funding for purchase and improvement by state of Michigan, subject to STB approval
  - Bring up to Michigan Line standards (PTC, 110mph top speed, etc)
  - Additional $3.2M for service development plan and environmental work
  - Construct new West Detroit connection track ($7.9M)
- Station improvements
  - Construct new Dearborn Intermodal Station ($28M)
  - Construct new platform, facilities at Troy ($8.5M)
  - Renovate Battle Creek station ($3.2M)
  - Preliminary engineering and environmental work for new Ann Arbor station ($2.8M)
- CREATE investments in Englewood Flyover ($133M) and Grand Crossing will also help Michigan Line

Total planned investment will exceed $600M

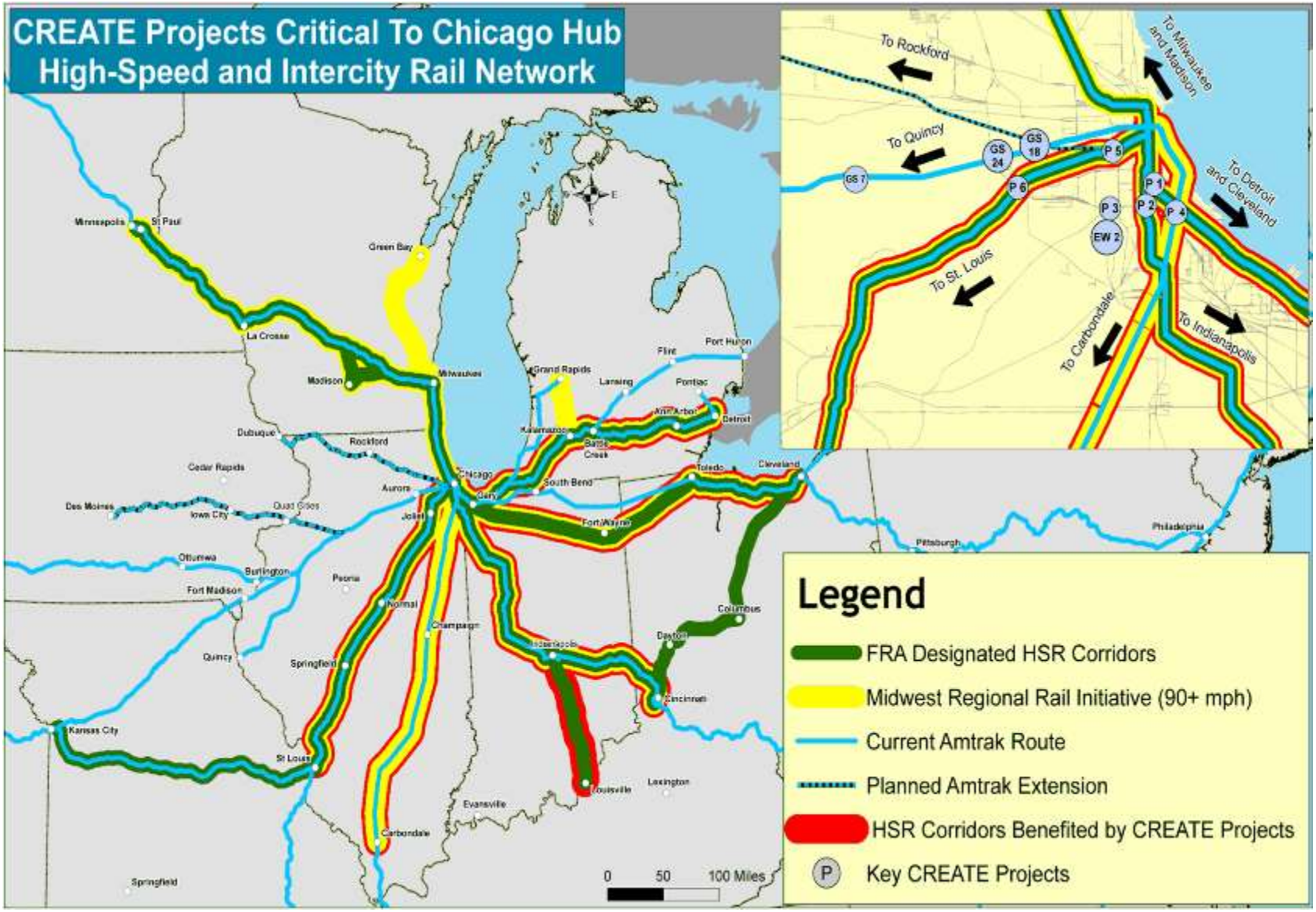
CREATE Projects Benefiting Passenger Rail

- Rail congestion in and around Chicago is a major challenge
- Passenger Rail Delay Reduction a goal of CREATE
  - 19 projects benefit Amtrak
  - 21 projects benefit Metra



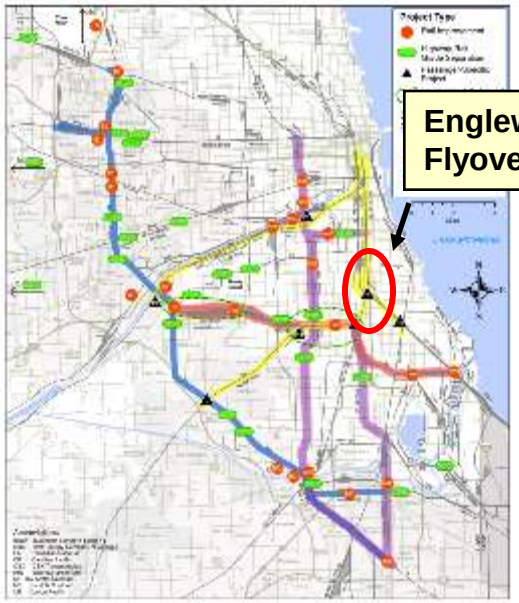
Note:
Projects benefiting passenger rail service are shown in red

CREATE supports the larger vision for the MWRRI



Englewood Flyover

- A bridge designed to eliminate the rail junction at 63rd and State
- Total cost will be $133M (funded by HSIPR)
- Will separate an at-grade crossing of an NS main, and eliminate daily conflicts between:
  - 78 Metra Rock Island commuter trains
  - 14 Amtrak trains
  - 46 NS trains



Amtrak Northeast Corridor

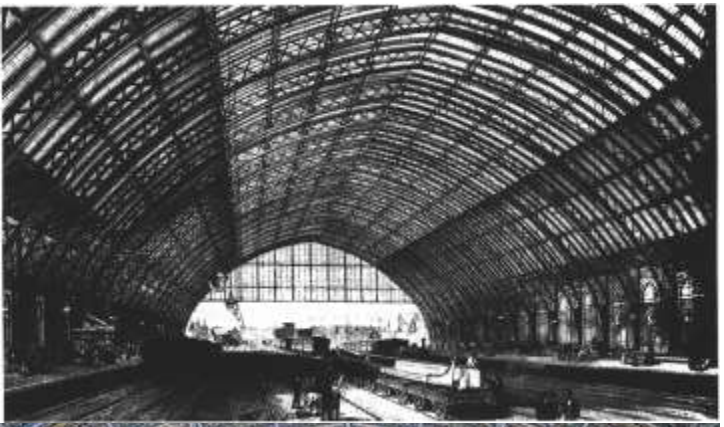
Acela Express on the 1835 Canton Viaduct – at 125mph

Susquehanna River Bridge, 1907

Baltimore's B&P Tunnel: In continuous service since 1873

- More than half our daily trains (153 of 305), more than 1,800 daily commuter trains
- Carries more than 722,000 riders every day!
- We own (and maintain) 363 of the 457 route-miles
  - 17 tunnels (six of them under the Hudson River)
  - 1,186 bridges (14 of them moveable)
- Top speeds of 150 mph for *Acela Express* and 125 mph for *Northeast Regionals*
- We carry more passengers than all the airlines put together between:
  - NYC and Boston
  - NYC and Washington, DC

Key Concepts



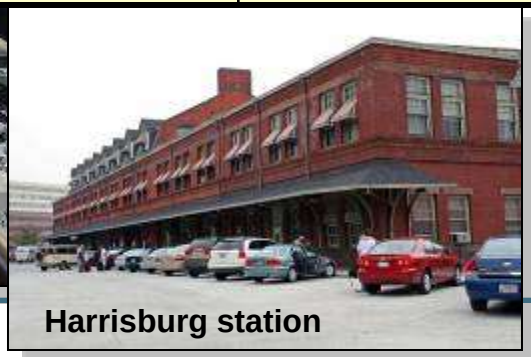
St. Pancras Station, London – then, and now

- Existing system serves as a foundation for development
  - Terminal facilities
  - Suitable segments are upgraded
  - Existing network feeds high speed operations
- Most foreign systems have developed in this incremental fashion
  - France
    - TGV lines use major terminals at endpoints
    - Speeds gradually upgraded as technology permitted
  - Germany
    - High speed equipment preceded high speed lines
    - Gradual introduction of faster track segments allowed ICE trains to realize their capabilities

A quick comparison

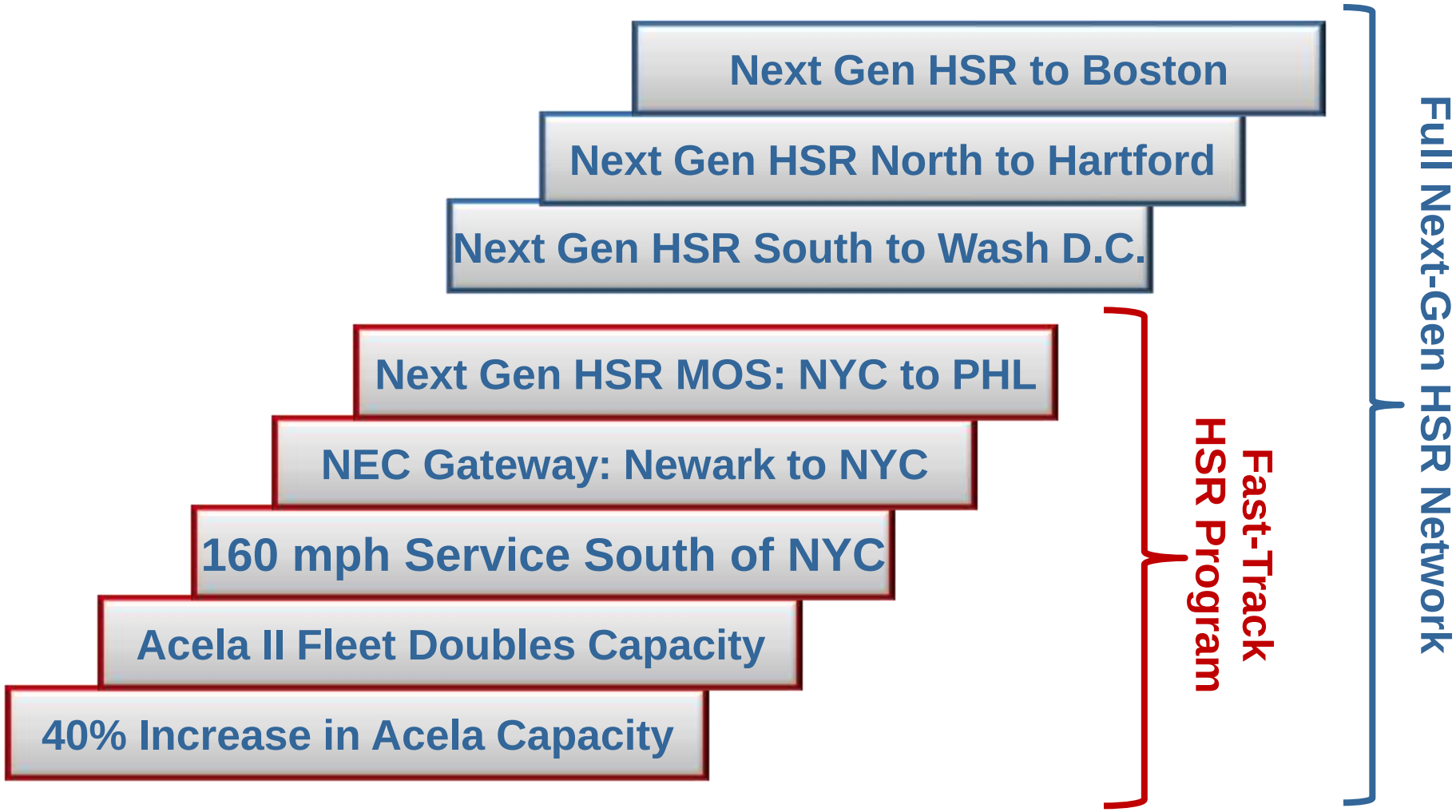
	Amtrak Keystone Corridor Improvements (2006)	Madrid-Valladolid high speed line (Dec 2007)
Route	104 mile line (Philadelphia-Harrisburg)	111 mile line (Madrid-Valladolid)
Scope of improvements	Restored electrification, improved track and signals for 110 mph service	Constructed dedicated ROW for 186 mph service, including a 28 km tunnel
Intermediate stops	10 intermediate stops, shared ROW with Norfolk Southern and SEPTA	1 intermediate stop
Trip time improvement	Harrisburg-Philly trip cut from 1:50 to 1:35	Trip time cut from 1:30 to 55 minutes
Annual Ridership	1,183,821 riders in FY 08	825,043 riders in 2008
Frequency	14 daily trains	33 daily trains
2007-2008 Growth	20.1%	More than 800%
Program cost	$145 million	$5.9 billion


Segovia-Guiomar station

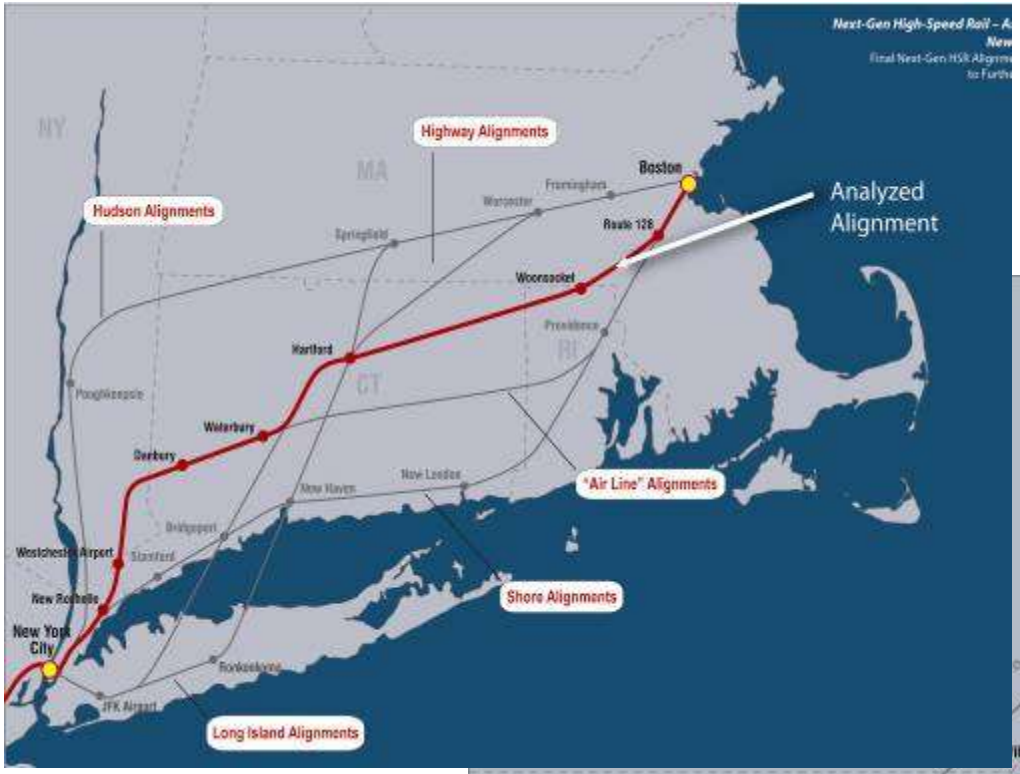

Harrisburg station


Alberto Saviejo photo

NEC Stair-Steps to Next-Gen HSR Vision



NEC Next Generation High Speed Rail



NYC – Boston Alignment

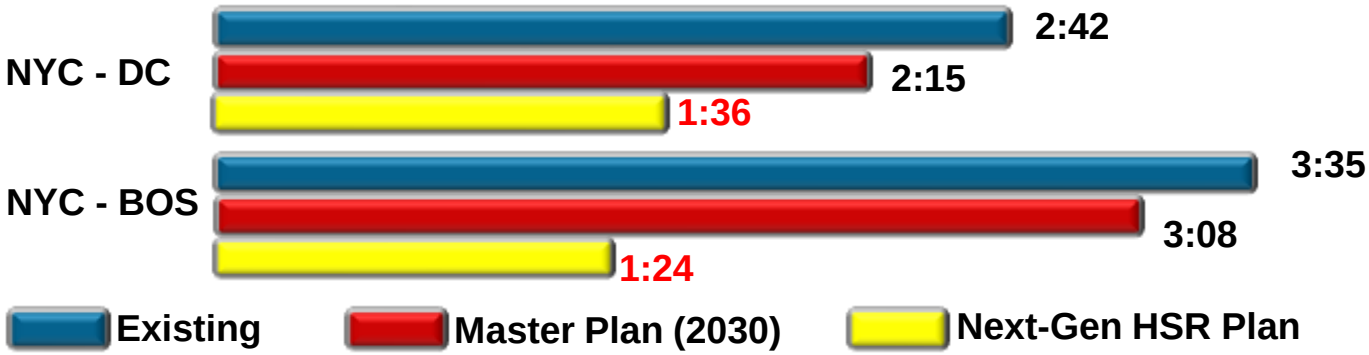
- Diverges north of New Rochelle to serve Conn. and RI
- Converges with NEC alignment at Rt. 128 station in Mass.

NYC - Washington

- Substantially parallels NEC
- New stations in Baltimore and Philadelphia more centrally located

Next-Gen High-Speed Rail : Dramatic Trip Time Reduction

- **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



- Higher frequency

Service Departures (Each Direction)

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

- Higher average speeds

Average Speeds (Super Express)

	Current	Next-Gen HSR
NYC - BOS	104 kph	238 kph
NYC - DC	136 kph	220 kph

Next-Gen High Speed Rail : Quantum Ridership Leap

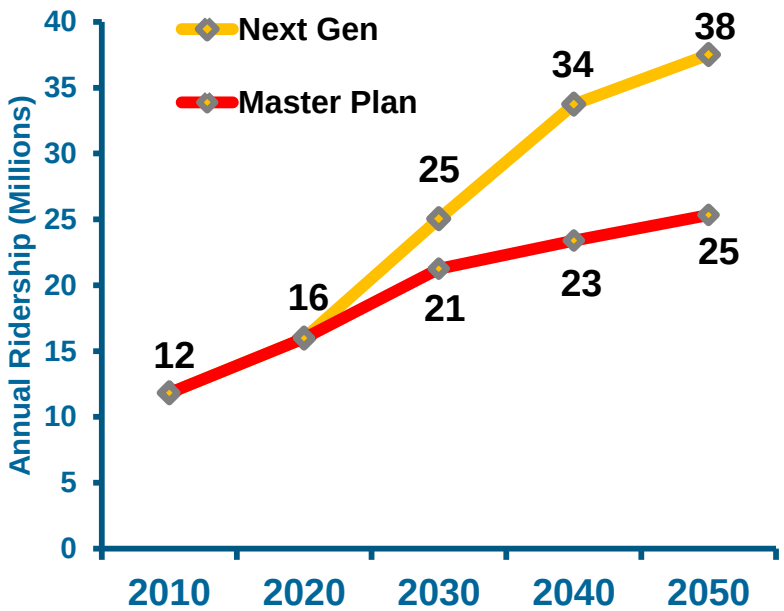
- **Huge ridership growth over Master Plan:2020 to 2040**
  - **Master Plan**:
    - 16 million to 23 million (+46%)
  - **Next-Gen HSR Plan**:
    - 16 million to **34 million (+111%)**

- **Major growth in premium service's share of NEC ridership (2040)**
- **Result: Next-Gen HSR Plan would raise revenues more than ridership**

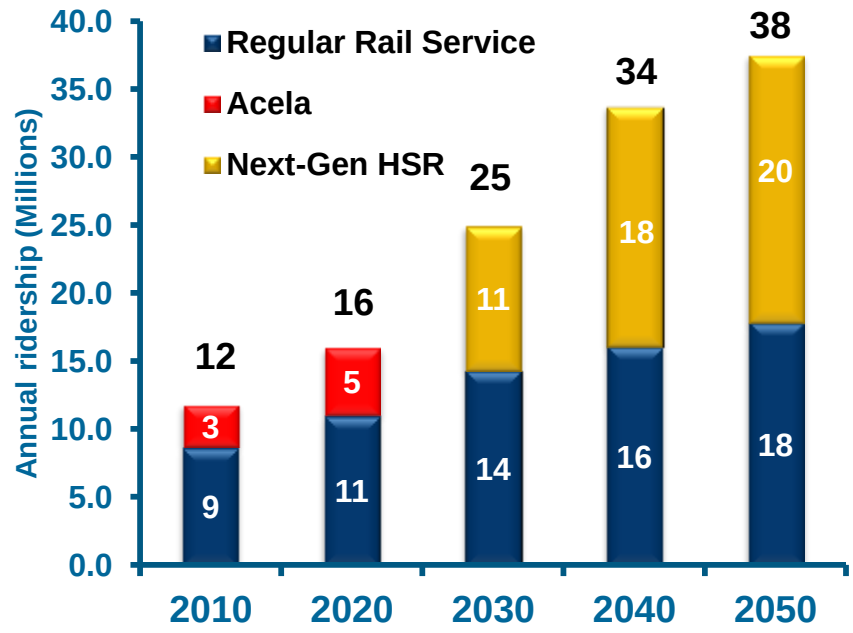
Premium Ridership (2040)

- Master Plan (Acela): 6.5 million (28%)
- Next-Gen HSR Plan: **18 million (52%)**

Next-Gen Compared to Master Plan



Ridership by Type of Service



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

Opportunities for partnership

- Amtrak is very interested in opportunities for high speed rail partnerships
- We are modernizing our plant – but we are also modernizing our organization and culture
  - Working on programs to develop a more collaborative organization
  - Make maximum use of talent
  - Pass on the core skills and functions as we manage a generational transition
  - Transform the way we deal with business partners, customers and each other
- We have sought partners who can work with us in a joint bid on HSR projects, reaching agreements with KPMG, DWH Strategic Advisors, Sharon Greene & Associates and TranSystems for NEC Next-Gen

The way ahead

- HSR projects are enormous undertakings – and to succeed, we must organize so that:
  - A consortium of partners can deliver all of the needed capabilities
  - The system itself delivers benefits long before build-out is complete
- Connectivity is vital to success – and a plan that incorporates feeder routes from one or many modes will be much more useful than one that does not
- Amtrak is very interested in pursuing HSR projects
  - We have selected a strong suite of commercial partners
  - We have a lot of experience working with state partners
  - Projects like these represent the future of rail – and can deliver meaningful results that will improve our quality of life