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

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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?

- Rail is inherently:
  - Energy-efficient
  - Clean
  - Scalable

- Can access city centers on existing rights-of-way

- Provides an affordable means of capacity expansion

**CO₂ Emissions by Mode**

- Passenger cars
- Light-duty trucks
- All other trucks
- Busses
- Aircraft
- Ships and boats
- Freight and passenger rail
- Other

**Modal Capacity Per Meter of Width**

- Auto: 200 persons per hour
- Bus: 1500 persons per hour
- Bus lane (separate): 5200 persons per hour
- Rail: 9000 persons per hour

Source: Int’l Union of Railways
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

- 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
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 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

- 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

- 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

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

- 40% Increase in Acela Capacity
- Acela II Fleet Doubles Capacity
- 160 mph Service South of NYC
- NEC Gateway: Newark to NYC
- Next Gen HSR MOS: NYC to PHL
- Next Gen HSR North to Hartford
- Next Gen HSR South to Wash D.C.
- Next Gen HSR to Boston

Fast-Track HSR Program

Full Next-Gen HSR Network
**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**
      - Hourly: 1
      - Daily: 10-15
    - **Next-Gen HSR**
      - Hourly: 3-4
      - Daily: 53-73

- **Higher average speeds**
  - **Average Speeds** (Super Express)
    - **Current**
      - NYC - BOS: 104 kph
      - NYC - DC: 136 kph
    - **Next-Gen HSR**
      - NYC - BOS: 238 kph
      - NYC - DC: 220 kph

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**NYC - DC**
- Existing: 2:42
- Master Plan (2030): 2:15
- Next-Gen HSR Plan: 2:42

**NYC - BOS**
- Existing: 3:35
- Master Plan (2030): 3:08
- Next-Gen HSR Plan: 3:35
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%)**

Premium Ridership (2040)
- Master Plan (Acela): 6.5 million (28%)
- Next-Gen HSR Plan: 18 million (52%)

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

Ridership by Type of Service
- Regular Rail Service
- Acela
- Next-Gen HSR

Annual Ridership (Millions)

- 2010: 12
- 2020: 16
- 2030: 25
- 2040: 34
- 2050: 38

- 2010: 3
- 2020: 5
- 2030: 14
- 2040: 16
- 2050: 18

- 2010: 9
- 2020: 11
- 2030: 18
- 2040: 20
- 2050: 20
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