MAKING HIGH-SPEED RAIL WORK IN THE NORTHEAST MEGAREGION

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EXECUTIVE SUMMARY

If the United States Northeast Megaregion is to grow and prosper, its cities and states must work together to become a single, globally competitive economic powerhouse. This report outlines a bold new proposal for world-class high-speed rail in the Northeast Megaregion, which will transform the economic geography of the whole Northeast.

By creating two dedicated high-speed rail (HSR) tracks from Boston to Washington, the Northeast Corridor will achieve significant improvements in capacity, reliability and travel times. Simultaneously addressing system-wide congestion and intercity connectivity, this new HSR network will sustain the Northeast’s role as the country’s premier economic and cultural driver. It will enable the region to meet the needs of a growing economy and population in the most environmentally responsible, cost-effective way. With this new mobility system in place, the Northeast can compete successfully with the great cities and nations of the world—many of which are already reaping the benefits of their own high-speed rail networks.

Proposed new HSR service will cut travel times in half, with one-and-a-half-hour service between New York and Washington, D.C., and one-hour-45-minute service between New York and Boston. It will enable a six-fold increase in the frequency of intercity service and a 10-fold increase in the capacity of the system. This enhanced network will translate to improved connectivity for the Northeast’s global cities—the anchors of New York, Washington, Philadelphia and Boston—and increased potential for other cities along the corridor.

Building this transformative high-speed rail network will require champions both in government and from the grassroots. The Obama administration has committed to building HSR around the country, and this proposal captures that forward-looking commitment to present new ideas for innovative and long-term funding of the project. As the following pages detail, in order for HSR to succeed, implementation must include dense population and ridership, walkable station districts, extensive regional transit connections, land use planning for transit-oriented development, cooperation among transportation authorities and investors, and perhaps most important, support from both the market and voters.
EXISTING CONDITIONS

Taken as a whole, the Northeast Corridor is the sixth-largest economy in the world, with a GDP of $2.59 trillion and a population the size of the United Kingdom. By 2050, the region is projected to grow to 70 million people with a $7 trillion GDP. In the same time period, the amount of urbanized land in the NEC is expected to increase by more than 23,000 square miles, anchored by five of the world’s great cities—Boston, New York, Philadelphia, Baltimore and Washington, D.C.—and supported by a constellation of other cities and towns.

The megaregion is well served by existing road, rail and air networks, including 10 port authorities, 12 major airports and Amtrak’s Northeast Corridor services. However, road and air networks suffer from substantial congestion, dragging down travel times on those modes. Among Amtrak’s services, which serve 250 million passengers a year, the Acela Express is the fastest, with average speed around 70 miles an hour. At top speeds, the Acela can get passengers from Washington to New York in two hours and 45 minutes, and from New York to Boston in three and a half hours.

Although the Northeast Corridor is Amtrak’s busiest region nationally, it faces a number of challenges including negotiating myriad rail operators, interacting with freight, poor on-time performance, speed and capacity constraints, and the ongoing costs of maintenance and incremental improvements.
The Current Costs of Congestion

825,000 Wasted Hours (20,625 weeks of vacation time)

$17.6 billion Total Costs of Congestion

540,000 Wasted Gallons of Gasoline

5,240 tons CO2 Emissions

Land impact: The Northeast Corridor is full of challenges—road congestion, increased urbanization—but also offers great potential for diverse industries and a skilled workforce to work more closely together.

Major Regional Employers by Industry

Projected Urbanization

Urbanized Area, 2000
Urbanized Area, 2025
Urbanized Area, 2050

Northeast Megaregion

Manufacturing
Accommodations
Retail
Finance
Professional Services
Government (Non-Federal)
Healthcare
Other
In order to operate a high-speed rail line that achieves serious trip-time reductions, the network needs to be built along a two-track railroad that runs throughout the corridor. The addition of two dedicated high-speed lines between Washington and Boston will make existing infrastructure capacity available to commuter services and freight traffic, reduce trip times to be competitive with air and auto travel, and dramatically increase the viable connections between residence and workplace. By improving service with a new alignment and service plan, the Northeast Corridor has the potential to triple its current annual ridership by 2040, serving more than 35 million annual riders by 2040.

The proposed two-track dedicated service between New York’s Moynihan Station and Boston’s South Station may follow a significantly different alignment than the existing NEC. Simultaneously solving the problems of tightly curving and constrained alignments through New York and southwestern Connecticut and the isolation of Long Island
from the rest of the Northeast, the new alignment proceeds east from
New York across Long Island, then north through a new, three-track
tunnel across Long Island Sound to New Haven. From there it travels
inland to Hartford, then along the I-84 corridor toward Worcester, and
finally east to Boston along the Massachusetts Turnpike. As an alternative
northern alignment, full Amtrak service will be retained or expanded
along the existing coastal route, with New Haven becoming the new
linchpin of the northern end. The southern half of the dedicated high-
speed rail line relies mostly on existing right-of-way from Washington’s
Union Station to New York’s Moynihan Station. Here, the physical
challenge is primarily an urban one—the tricky alignments through
Philadelphia and Baltimore limit speeds for the whole line. Solving two
problems with one change, the proposed alignments utilize tunnels to
dramatically improve speeds through these cities while also creating new
downtown stations in areas ripe for economic development. Further
linkages include direct service to Philadelphia International Airport and
improved regional connections.
Proposed service would reduce travel times between Washington and New York to one and a half hours, between Philadelphia and New York to 37 minutes, and between New York and Boston to one hour 45 minutes, at an estimated cost of $98.1 billion. The line will be built in phases, starting with the New York-Philadelphia connection in the south and New Haven-Boston in the north, followed by completion of the southern end to Washington, D.C., and eventually the connection of the northern end through Long Island.

DESIGN: INTERMODAL LINKS AND REGIONAL CONNECTIVITY

Rail anywhere, at any speed, performs better when it’s connected to other modes. In order for any high-speed rail network to succeed, it must be fully integrated with the connecting regional transportation networks: not just commuter trains, but subways, light-rail systems, cars, buses and planes (for long-distance travel) as well. This not only increases ridership; it also supports the extension of new land use patterns concentrated around transit.

Links between modes must be seamless, both physically and temporally. They require an integrated fare system—riders should be able to swipe one card to get from origin to destination, no matter the number of different modes they travel on—and closely coordinated schedules with an absolute minimum of waiting. The more times passengers have to consult a schedule, the more likely they are to find a different way to get there.

Since high-speed rail will need to stop in central locations in NEC cities, the regional transportation networks need to ensure that underserved areas have suitable connections to the HSR network. And HSR fare structures need to reflect the economic and social diversity of the Northeast. If the NEC is to realize all of HSR’s potential benefits, residents from all social classes must be able to access the train, and the train operators must be able to draw on as broad a passenger base as possible.

DESIGN: STATIONS AND STATION AREAS

To achieve the land use benefits of HSR investment, cities and regions must define and implement development and management plans to direct and coordinate public and private investment. Stations and station areas must be planned and constructed to value viable public spaces and an active public realm; encourage private investment and public/private partnerships in and around the stations; and promote social equity. For areas in and around train stations along the Northeast Corridor,
transportation can direct the movement of people in a way that catalyzes development. In many cities, high-speed rail will be a catalyst to develop stations as nodes that direct growth. When done successfully, this can create new city centers, and extend and strengthen existing central business districts.

In Philadelphia, a new Market East Station becomes the centrally located stop for high-speed rail. This station works in tandem with 30th Street Station to restore the Market Street corridor from Center City to University City. By creating a cohesive visual element along Market Street, connecting the Schuylkill River waterfront to the University of Pennsylvania and drawing on Old City’s tourism, these two complementary stations can create an energy that elevates the entire corridor.

A new alignment through Baltimore creates a station at the Charles Center, in the heart of the city’s central business district. Besides taking advantage of a straighter path that will allow for faster speeds in and out

The Market Street District: By bringing high-speed rail through Philadelphia at a new Center City station, the entire corridor becomes an economic anchor for the city, with 30th Street Station and University City at the western end.
**Baltimore:** The new high-speed rail station at Charles Center is strategically located in the city's central business district.

**Philadelphia:** A remade Market East Station anchors high-speed rail in Center City, complementing 30th Street Station just across the Schuylkill River.
of the city, the new station can capitalize on a vibrant network of public spaces in the surrounding area.

Finally, urban design, development and management guidelines for the Northeast Corridor will ensure that stations and station areas are constructed in a way that values viable public space and an active public realm; enables public/private partnerships to fund development; and promotes social equity for those living near or accessing the stations.

SUSTAINABILITY

When looking at environmental, economic and social factors related to the need for increased mobility in a growing region, high-speed rail is the most effective way to achieve an overall sustainability strategy in the Northeast. Rail’s performance ranks highest in the five key aspects of environmental sustainability: land use, air quality, water quality, energy and connectivity. Transportation is responsible for 29 percent of U.S. carbon emissions, which have been linked to global warming and decreased air quality. More trains mean fewer new roads built, which reduces the number of permeable surfaces whose runoff affects water quality. In terms of energy, even if trains are coal-powered, they reduce our dependence on foreign oil. And when quality regional transportation systems link to high-speed rail, connectivity and its environmental benefits follow.

FUEL WASTED DUE TO TRAFFIC CONGESTION

ANNUAL NUMBER OF GALLONS WASTED PER DRIVER 2007
City names denote the entire urban area
Data: Texas Transportation Institute’s Urban Mobility Report
High-speed rail’s central locations support and encourage greater concentration of land use around stations. When a train station becomes a center-city hub, activity is concentrated there, discouraging sprawl and allowing for businesses to feed off of one another.

High-speed rail can promote social sustainability. By widening the market of jobs available to workers, HSR levels the playing field, provided it is affordable enough to be accessed by multiple classes of riders.

TRANSFORMATIONS

The proposed high-speed rail system, complemented by the improved connectivity of regional and inter/intracity transit, has the potential to transform the spatial relationships of the Northeast Corridor. High-speed rail improves connectivity between businesses, facilitating the movement of labor and goods resulting in a new economic geography—one that may be particularly valuable for the knowledge industries that will benefit from agglomeration economies. This new geography will result in economic growth in the corridor’s major cities, making the Northeast Corridor more competitive in the global market. Improved connectivity will be particularly valuable for new household formation and extended work-home distances in newly urbanized areas.

Large cities with major economies require a different development strategy than cities with growing economies. Places like New York, Boston and Washington—cities that are growing, and have higher educational attainment and area median incomes—will benefit differently from high-speed rail than Philadelphia, Baltimore or other smaller cities along the corridor. These places need a strategy that ensures they don’t lose economic activity as a result of their new proximity to strong-market cities. Furthermore, none of these cities can be considered all strong or all weak: While New York, for example, has higher educational attainment, it also has higher unemployment. Economic development strategies, therefore, must vary carefully from city to city and region to region.

COST-BENEFIT ANALYSIS

A generation of transportation projects has been evaluated, often by transportation agencies, on the basis of a ratio between the benefits they engender and their costs. Analytical literature suggests that the quantification of benefits is difficult to do and that the methodologies used for cost-benefit analysis inherently favor smaller projects as well as those with low, or no, capital cost.

Notwithstanding these limitations, the cost-benefit analysis—prepared
for the proposed NEC HSR with ticket fares, emissions reduction, improved connectivity, time savings and increased safety as its benefits—shows a positive benefit-cost ratio, indicating the economic feasibility of high-speed rail. But, more important, the investment brings broad and long-lasting—although less measurable—benefits to jobs, land use, development, connectivity, economic competitiveness, energy use and the environment.

**IMPLEMENTATION**

In order to successfully build a new interstate high-speed rail network, creative methods of governance, financing and environmental review will need to come together. Nearly all of the countries that have initiated HSR systems have done so with funding from national governments, and this should be done here as well. A matching contribution from Northeast states and regions will help meet capital costs, and a portion of the up-front investment could be recouped through a long-term lease of the corridor, as the U.K. is now proposing to do with its HS1 line, where an expected 40 percent of the public investment is expected to be returned to the government.
Since funding will need to be largely from the federal government, a new agency, known as the Northeast Corridor Commission (NECC), will bring the interstate politicians and authorities to the same table to figure out how to cooperate in order to get federal dollars to the region. This new entity will manage the implementation process, and will ensure that discrete agencies are talking with each other and working together toward the ultimate goal of a rail network that benefits the entire region.

There needs to be a system for dedicated and sustainable financing that can handle the large costs and complicated jurisdictional structure of building in the Northeast Megaregion. The responsibility of financing the construction of HSR and ensuring continued funding should be taken on by the federal government, or a regional agency, because it has the capacity to manage the risk of the project and realize the long-term benefits. By approaching HSR as a long-term investment, the government provides an opportunity for the private sector to invest in the HSR system through public-private partnerships, where the government can recoup its investment in HSR, and where funding can be dedicated, sustainable and guaranteed. Public financing mechanisms include the creation of a Northeast Corridor Commission Trust Fund, government grants, a region-wide tax increment financing district, and a range of tools to cover operating costs including gas taxes, interstate tolls, user fees, value added tax and station area sales tax. After the public sector has taken on the financing of building HSR, opportunities develop for private sector investment.

**A new governance model:** The Northeast Corridor Commission can achieve the fundamental goals of building high-speed rail in the NEC, preserving unified corridor operations, increasing states’ involvement, balancing operators’ needs, obtaining dedicated revenue streams, and successfully competing for federal HSR grants.
CONCLUSION

The authors of this report strongly advocate for the implementation of high-speed rail in the Northeast Corridor as the key to unlocking the economic growth and competitive advantage of the Northeast Megaregion. At the same time, investment in high-speed rail in the Northeast Corridor is but one element among several high-speed rail networks serving America’s 10 other megaregions as part of a national rail plan, which can transform the connectivity, economic geography and performance of the entire country.

With the federal government committed to high-speed rail, the country is poised to take up the challenge of such a substantial, potentially transformative new infrastructure project—one that can and will fundamentally change the way our cities work, and work with each other. The 21st-century narrative will be one not of global cities, but of global megaregions. When megaregions work as unified markets, strongly linked internally and externally, they can achieve the investment and innovation necessary to compete on an international stage.

For the past two centuries, each generation of Americans has embraced the latest transportation mode to shape the country’s mobility systems and with them, the nation’s destiny. Now is the time for American high-speed rail that will sustain the country’s economic potential through the 21st century. By building the nation’s premier world-class high-speed rail network, the Northeast can lead the way.