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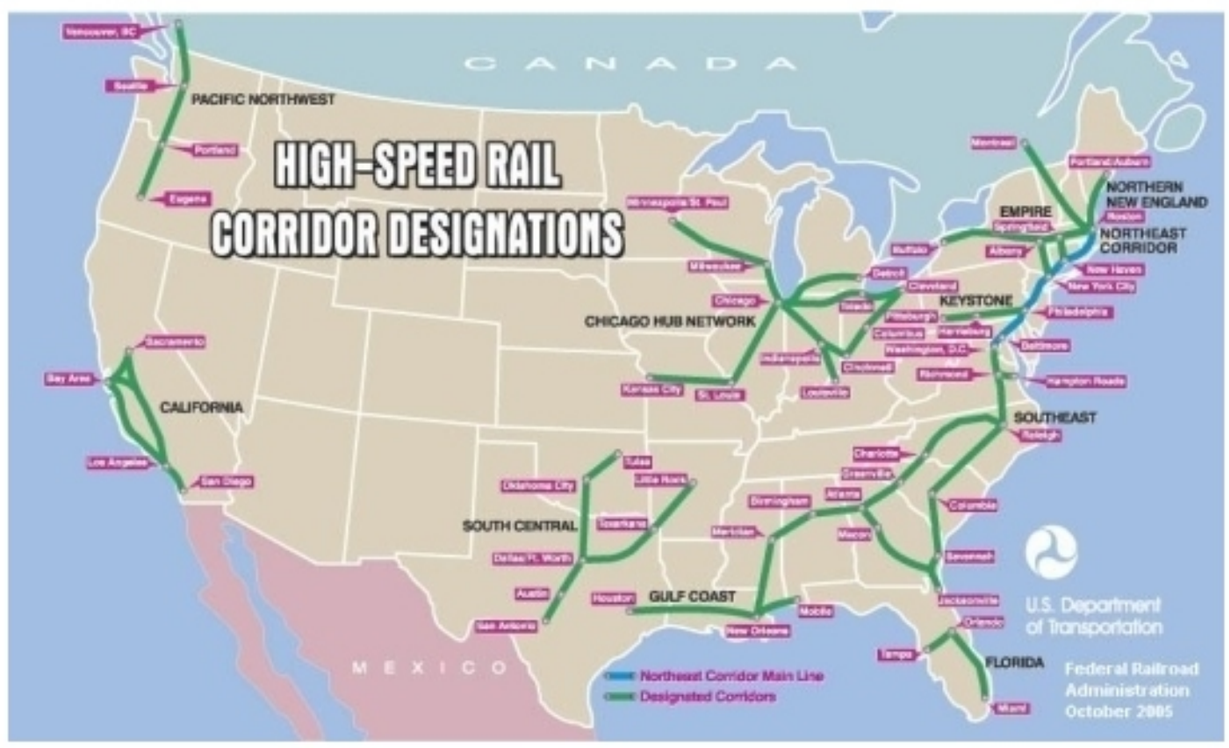
May 1 2009 8:00 AM

Science / Technology

Mega-Regions and High-Speed Rail

The Obama administration recently pledged $8 billion for high-speed rail. While just a fraction of the overall stimulus package and just a drop-in-the-bucket of what is needed to build a real national high-speed rail network, the funds generated considerable hub-bub and outright jubilation among regionalists, environmentalists, energy efficiency advocates, and those who have long fought for improved U.S. rail transit. It also has encouraged a mad political scramble for funds as regions position for federal monies. In Canada, there is a mounting drumbeat for high-speed rail connecting Windsor, Toronto, Ottawa, Montreal, and Quebec cities and also for connecting Vancouver to Seattle.

For starters, here's a map of proposed U.S. high speed rail projects:



It's clear that the U.S. and North America lag far behind countries like Japan with its Shinkansen or France with the TGV on high-speed rail connectivity.

But how to base decisions on what routes get funded? How to avoid a purely political outcome and create a framework for investing in high-speed rail that makes the most economic sense?

There are many metrics - from population concentration to economic activity - which can be used to gauge the merits of high-speed rail routes. But my own research on mega-regions provides a potentially useful framework for thinking about where and how to invest in a national high-speed rail system.

Mega-regions are large-scale economic units of multiple large cities and their surrounding suburbs. My research team and I defined them using satellite images of the world at night to identify contiguous economic areas with more than five million people producing $100 billion or more in economic output. The world's 40 largest mega-regions account for two-thirds of all the global economic activity and 85 percent of the world's technological innovation while housing just 18 percent of its people.

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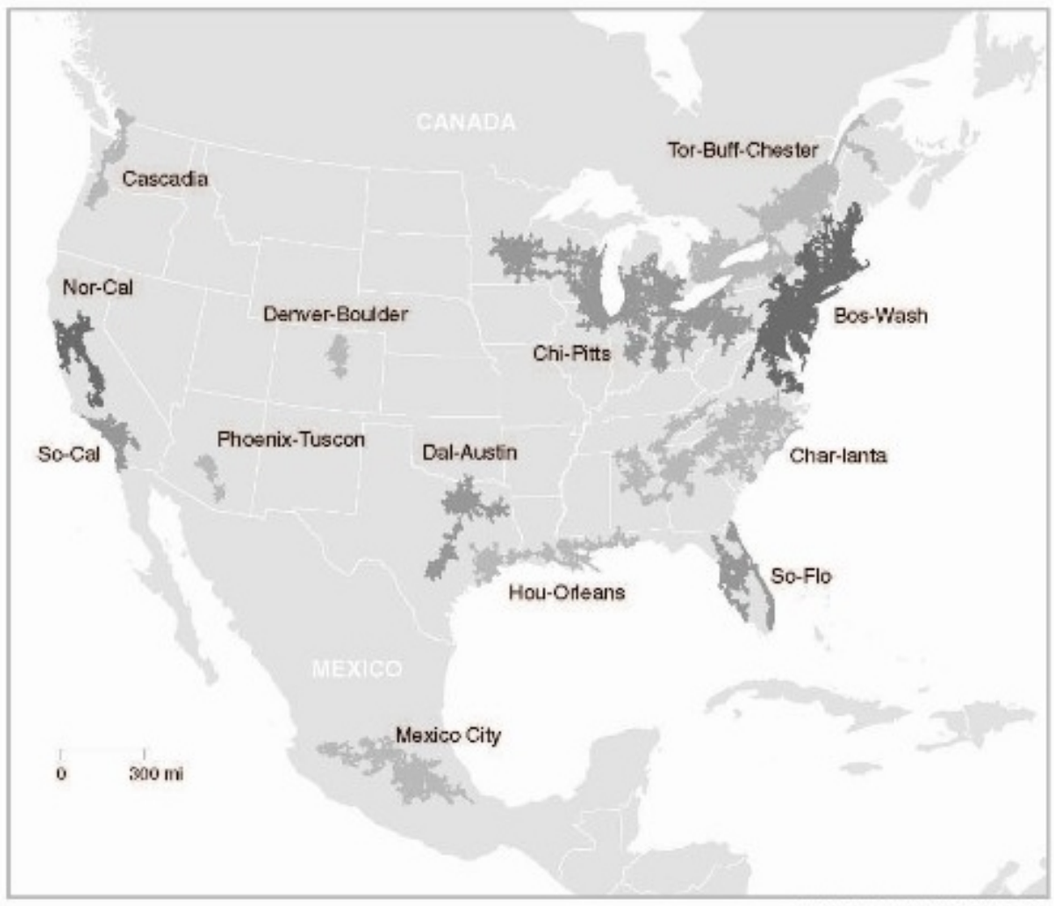
FIGURE 3.1 MEGA-REGIONS OF NORTH AMERICA



MAP BY TIM SULDEN AND RYAN MORRIS

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The largest of North America's mega-regions is the great "Bos-Wash" mega-region initially identified by the geographer Jean Gottman. It stretches down the east coast corridor encompassing the east coast cities of Boston, New York, Philadelphia, Baltimore, and Washington, D.C., and is home to more than 50 million people and produces more than $2.2 trillion in economic activity. Its economic output is greater than that of the UK and France and more than double that of India or Canada. The second biggest, which Gottman dubbed "Chi-Pitts," covers more than 100,000 square miles and is home to 46 million people, producing $1.6 trillion in economic output. Taken together, America's mega-regions produce more than three-quarters of its economic output and the lion's share of its innovations (see the table below).

	Mega Region	*LRP (Billions)*	*Population (Millions)*
1	Bos-Wash	2200	54.3
2	Chi-Pitts	1600	46
3	Char-lanta	730	22.4
4	So-Cal	710	21.4
5	Tor-Buff-Loo-Mon-Tawa	530	22.1
6	Nor-Cal	470	12.8
7	So-Flo	430	15.1
8	Dal-Austin	370	10.4
9	Hou-Orleans	330	9.7
10	Cascadia	260	8.9
11	Denver-Boulder	140	3.7
12	Phoenix-Tucson	140	4.7

In the main, the proposed high-speed rail routes map pretty well to U.S. mega-regions. Given the fact that megas are dense and interconnected centers of population and economic activity, it makes sense to develop high-speed rail connections within mega-regions first, and later develop connections between contiguous ones, say for example down the east and west coasts or across the Great Lakes region.

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The table below, compiled by Patrick Adler at the Martin Prosperity Institute, shows the distance between key cities and then compares the driving times (calculated on Google) to current top high-speed rail speeds (from Transportation Quarterly):

High Speed Rail Timetables

Route	Driving Time (Via Google Maps)	Driving Distance (Via GoogleMaps)	Time at Average French TGV Speed (155 mph)
BOS-WASH			
Boston to Washington DC	7:45	441.00	2:54
Boston to New York	3:53	215.00	1:23
Washington to New York	4:04	228.00	1:28
Philadelphia to New York	1:49	95.60	36 Minutes
SO-CAL/ NOR-CAL			
San Francisco to Los Angeles	5:54	381.00	2:27
Los Angeles to San Diego	1:58	120.00	46 Minutes
CASCADIA			
Portland to Seattle	2:49	176.00	1:07
Seattle to Vancouver	2:52	141.00	54 Minutes
Route	Driving Time (Via Google Maps)	Driving Distance (Via GoogleMaps)	Time at Average French TGV Speed (155 mph)
CHI-PITTS			
Chicago to Pittsburgh	7:34	463.00	2:58
Chicago to Minneapolis	6:46	408.00	2:37
DAL-AUSTIN			
Dallas to Austin	3:07	196.00	1:15
Dallas to Houston	3:40	239.00	1:32
TOR-BUFF-MON-TAWA			
Toronto to Windsor	3:54	229.90	1:47
Toronto to Montreal	5:36	336.00	2:09
CHAR-LANTA			
Atlanta to Charlotte	3:55	244.00	1:34
Atlanta to Raleigh	6:27	406.00	2:36

Philadelphia becomes a veritable suburb of NY, its commute time shrinking from nearly two hours to slightly more than a half hour. Washington-NYC and Boston-NYC become hour-and-a-half trips. San Diego becomes a bedroom suburb of Los Angeles. And commute times shrink considerably across Cascadias' main cities: The time to get from Portland to Seattle shrinks to just over an hour, while travel between Seattle and Vancouver is reduced to less than an hour. It would take just slightly longer than an hour and a half to get from Charlotte to Atlanta. And commutes between Dallas and Houston and Dallas and Austin shrink to an hour and a half or less.

Better high-speed rail connections promise considerable economic efficiency gains. And they also promise to relieve the psychological burdens of commuting by car. Research by behavioral economists like Nobel prize-winner Daniel Kahneman finds that long car commutes are among the things that most adversely affect our happiness.

But there is an even bigger and more fundamental reason to connect our mega-regions through high-speed rail. As I recently argued in The Atlantic, our current economic crisis promises to powerfully reshape America's geography. There will be winners and losers, and a new economic geography will emerge in time.

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Geographic expansion, as I noted there, is a fundamental axis of economic recovery and development. Recovery after the Long Depression of the 1870s was in part powered by the rise of the large-scale industrial city that grew up around raw materials, ports, and railroads, expanding outward along its early street-car lines. While many see the rise of Keynesian spending (particularly World War II spending) as key to U.S. recovery from the Great Depression of the 1930s, post-war recovery was propelled by the rise of another era of geographic expansion - the rise of the Sunbelt and the massive growth of auto-oriented suburbia. Demand for cars surged to move workers between home and work. And suburban houses all had to be filled with the refrigerators, washing machines, dryers, television sets, and consumer appliances rolling off America's assembly lines. This post-war auto-oriented "fordist" development model worked to ensure that mass production and mass consumption could grow together fueling the expansion of America's great golden era.

But fordism has come smack up against its limits. It's cheaper to produce many industrial goods off-shore, and the geography of post-war suburbia has been stretched to its breaking point. It may well be impossible for sustained recovery to come from breathing life back into the banks, auto companies, and suburban-oriented development model. A new period of geographic expansion - or what geographers term a "new spatial fix" - will eventually be needed to spur a renewed era of economic growth and development.

The history of capitalist development is the history of the more expansive and intensive use of space. Post-war suburbs, the rise of larger metropolitan areas, the development of multi-nodal regions with edge cities as well as downtown cores are part and parcel of this process of geographic development. It's a mistake to consider suburban sprawl a backward step (as some do), and to see only more compact urban style back-to-the-city development as a path to the future. The rise of the mega-region is the cornerstone of a new, more intensive and also more expansive use of space.

New periods of geographic expansion require new systems of infrastructure. Ever since the days of the canals, the early railroad, and streetcar suburbs, we've seen how infrastructure and transportation systems work to spur new patterns economic and regional development. The streetcar expanded the boundaries of the late 19th and early 20th century city, while the railroad moved goods and people between them. The automobile enabled workers to move to the suburbs and undertake far greater commutes, expanding the geographic landscape still further.

Mega-regions, if they are to function as integrated economic units, require better, more effective, and faster ways move goods, people, and ideas. High-speed rail accomplishes that, and it also provides a framework for future in-fill development along its corridors. Just as development filled-in along the early street-car lines and the post-war highways, high-speed rail will encourage denser, more compact, and concentrated development with growth filling in along its routes over time. Spain's new high-speed rail link between Barcelona and Madrid not only massively reduced commuting times between these two great Spanish cities, according to a recent New York Times report, it has also helped revitalize several declining locations along the line.

It's time to start thinking of our transit and infrastructure projects less in political terms and more as a set of strategic investments that are fundamental to the speed and scope of our economic recovery and to the new, more expansive economic geography required for long-run growth and prosperity.