

STATEMENT FOR THE RECORD

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BEFORE THE

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TRANSPORTATION INFRASTRUCTURE COMMITTEE
SUBCOMMITTEE ON RAILROADS, PIPELINES,
AND HAZARDOUS MATERIALS

HEARING ON
“FREIGHT AND PASSENGER RAIL: PRESENT AND FUTURE
ROLES, PERFORMANCE, BENEFITS, AND NEEDS”

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Testimony of Phillip Longman

New America Foundation

Steel Wheel Interstates

Madam Chairman and members of the Subcommittee, good morning. My name is Phil Longman.

I am a senior fellow of the New America Foundation, a non-partisan public policy institute headquartered here in Washington. I am also the author of a cover story in the current issue of the *Washington Monthly* (“Back on Tracks”) that addresses what is for many a novel idea.

It is a proposal that offers stunning improvement in highway safety, maintenance and congestion costs, energy use, green house gas emissions, public health, shipping costs and plenty of short-term economic stimulus as well. If fully implemented, it could get as many as 83 percent of all long-haul trucks off our nation’s highways by 2030, reduce carbon emissions by 39 percent and oil consumption by 15 percent compared to business as usual. I call it the “Back on Tracks” project.

The best way to explain this proposal is to begin with a concrete example. Six days before Thanksgiving, a truck driver heading south on Interstate 81 through Shenandoah County, Virginia ploughed his tractor-trailer into a knot of cars that had slowed on the rain-slicked highway. The collision killed eighty-year-old Cordula Elma Leara, her 4-year-old grandson, Ivan Ryman, and her one-year-old granddaughter, Maggie.

It was a tragedy, but not an unusual one. Semis account for roughly one out of every four vehicles that travel through Virginia on I-81’s four lanes, the highest percentage of any interstate. They are there for a reason: I-81 traces a mostly rural route from the Canadian border to Tennessee, and the cities in its path—Syracuse, Scranton, Harrisburg, Hagerstown, and Roanoke among them—are mid-sized and slow-growing. This makes the highway a tempting alternative to I-95, the interstate that connects the eastern seaboard’s major metropolises, which is so beset with tolls and congestion that truckers will drive hundreds of extra miles to avoid it.

This is bad news for just about everyone. Even truckers have to deal with an increasingly overcrowded, dangerous I-81, and for motorists it’s a white-knuckle terror. Because much of the road is hilly, they find themselves repeatedly having to pass slow-moving trucks going uphill, only to see them

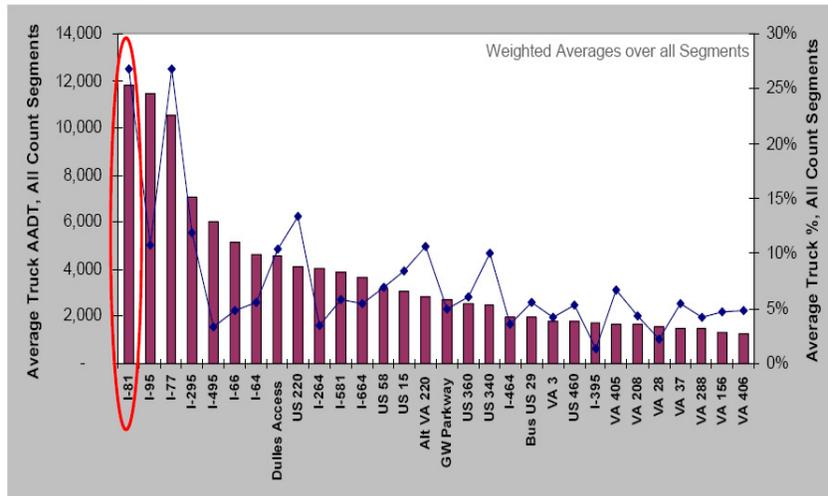
looming large in the rear view mirror on the down grade. For years, state transportation officials have watched I-81 get pounded to pieces by tractor-trailers—which are responsible for almost all non-weather-related highway wear and tear. Making matters worse are projections that traffic will rise by 67 percent in just ten years.¹



The conventional response to this problem would be simply to build more lanes. It is what highway departments do. But at a cost of \$11 billion, or \$32 million per mile, Virginia cannot afford to do that without installing tolls, which might have to be set as high as 17 cents per mile for automobiles. When Virginia's Department of Transportation proposed doing this early last year, truckers and ordinary Virginians alike set off a firestorm of protest. At the same time, just making I-81 wider without adding tolls would make its truck traffic problems worse as still more trucks would divert from I-95 and other routes.

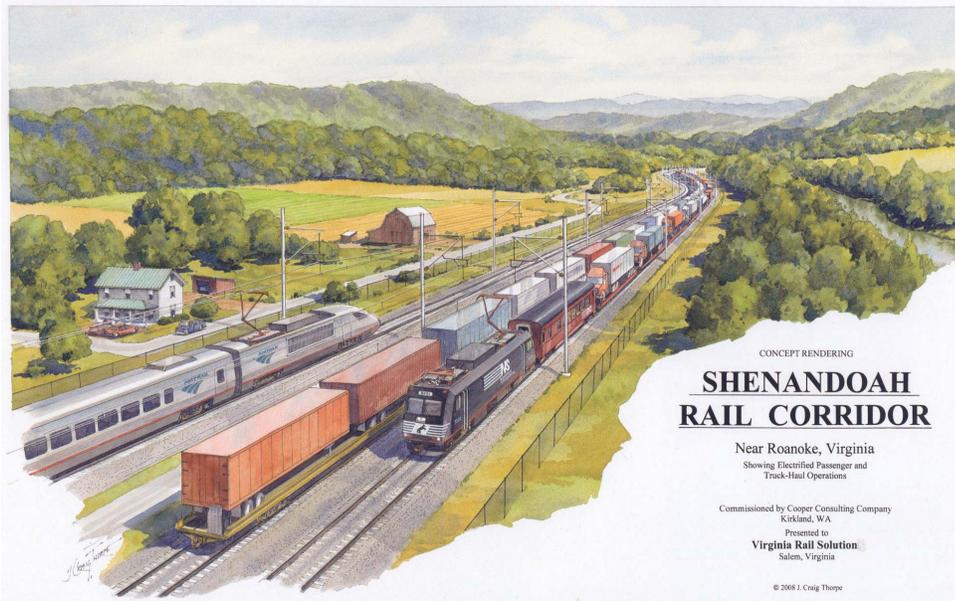
¹ Alan Meyers, Cambridge Systematics, Inc., Update on Opportunities for Truck to Rail Diversion in Virginia's I-81 Corridor, Presented to the Commonwealth Transportation Board September 17, 2008, <http://www.drpt.virginia.gov/special/files/I-81%20Freight%20Rail%20Study%20Update.pdf>, p. 6., retrieved January 25, 2009.

Volume of Truck Traffic on U.S. Interstates



Source: Virginia Department of Transportation Traffic Counts (2005)
 Alan Meyers, Cambridge Systematics (2008)

There is, however, another way. As it happens, running parallel to I-81 through the Shenandoah Valley and across the Piedmont are two mostly single-track rail lines belonging to the Norfolk Southern Railroad. These lines, like America's freight railroads generally, have seen a resurgence of trains carrying containers, just like most of the trucks on I-81 do. Due to driver shortages, energy costs and highway congestion, more and more shippers want to use rail these days, and many more would do so if trains moved faster. The problem is insufficient rail capacity to accommodate all the freight that would go by train. Without upgrading track and removing various choke points, the Norfolk Southern cannot run trains fast enough to be time-competitive with most of the trucks hurtling down I-81. Even before the recent financial meltdown, the railroad could not generate enough interest from Wall Street investors to improve the line sufficiently.

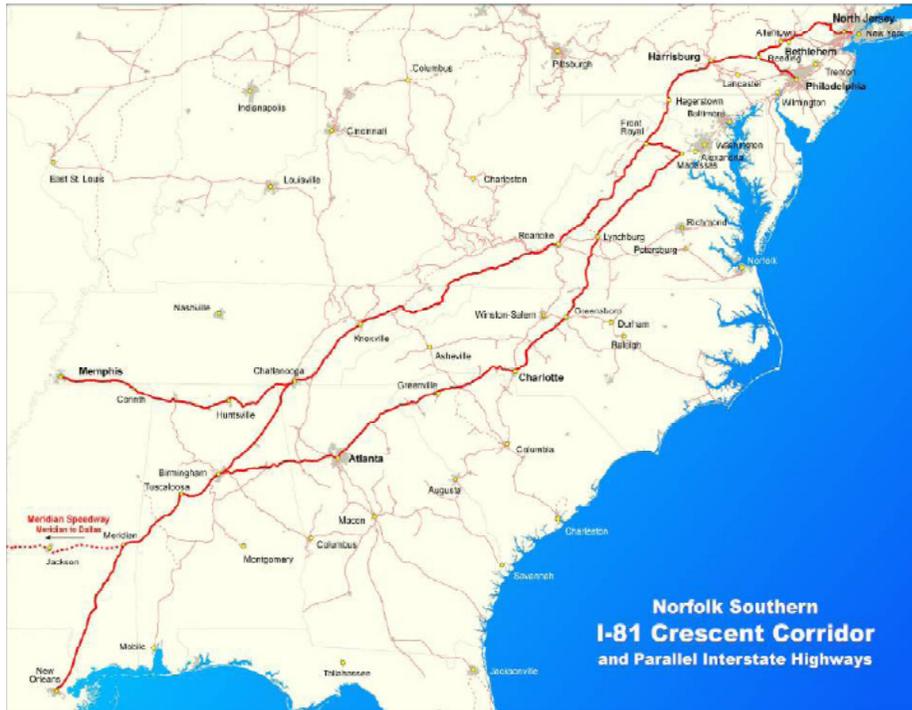


An alternative to widening Interstate 81 or making it a toll road, as envisioned by the advocacy group, Virginia Rail Solutions.

Here's where the "Back on Tracks" proposal comes in. *Instead of using public money to endlessly widen I-81 and other Interstates to accommodate more and more trucks, use it to improve parallel freight rail infrastructure.* A study sponsored by the Virginia DOT finds that a cumulative investment over 10 to 12 years of less than \$8 billion would divert 30 percent of the growing truck traffic on I-81 to rail.² That would be far more bang for the state's buck than the \$11 billion it would take to add more lanes to the highway, especially since it would bring many other public benefits, from reduced highway accidents and lower repair costs to enormous improvements in fuel efficiency and pollution. *Today, a single train can move as many containers as 280 trucks using one-third as much energy, and that's before any improvements to rail infrastructure.*³

² *The Northeast – Southeast – Midwest Corridor Marketing Study: Examining The Potential To Divert Highway Traffic From Interstate 81 To Rail Intermodal Movement*, Executive Summary. Table 1. Virginia Department of Transportation, <http://www.drpt.virginia.gov/studies/files/I-81-Executive-Summary-revised.pdf>, retrieved January 25, 2009.

³ Gil Carmichael, (former Federal Railway Administrator and now Senior chairman of the board of directors for the Intermodal Transportation Institute at the University of Denver), "The Case For Interstate II," *Traffic World*, July 10, 2006, p. 6. <http://www.du.edu/transportation/documents/July10Commentary.pdf>, retrieved January 25, 2009.



With modest public investment, existing private rail infrastructure parallel to I-81 could become the nation’s first “steel wheel interstate,” diverting million of trucks off roadways.

Virginia has made a modest investment in helping Norfolk Southern improve its infrastructure, but there is much more that could and *should* be done, both along the I-81 corridor and nationally. All over the country there are opportunities in which relatively modest amounts of capital could unclog rail traffic bottlenecks and divert large volumes of trucks off highways. A few such public/private projects have already been done successfully, but many more are sitting on planners’ shelves awaiting funding.

Key Statistics: Energy and the Environment

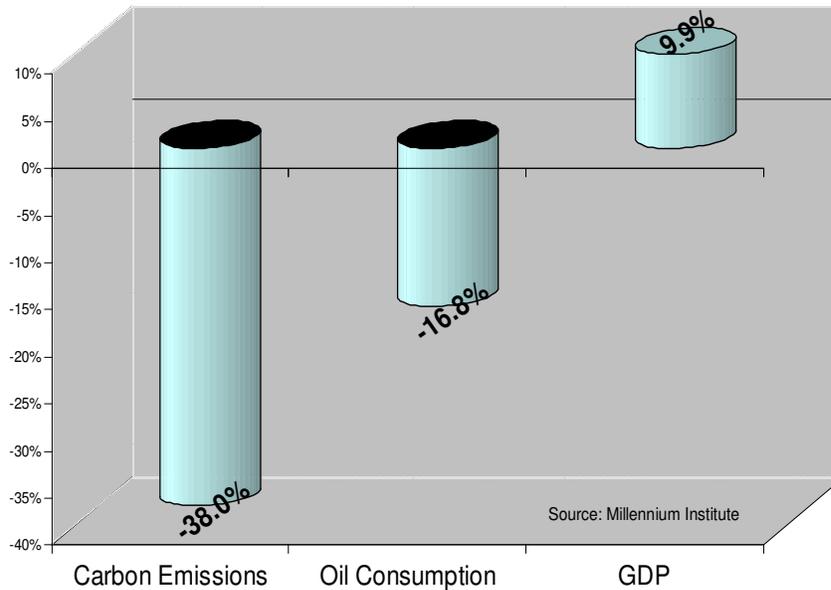
Greenhouse gas emission from heavy-duty vehicles, according to the Environmental Protection Agency, grew by 57 percent between 1990 and 2003, the largest increase of any transportation source.

- Average fuel mileage for tractor-trailer trucks has fallen to just 5.3 miles per gallon and is now no better than in 1980, according to the National Commission on Energy.
- In 2007, according to the Association of American Railroads, U.S railroads were able to move one ton of freight 436 miles using just one gallon of fuel. Moreover, the railroads' energy efficiency keeps getting better, improving 3.1 percent between 2006 and 2007. Railroads can now move a ton of freight from coast to coast using just seven gallons of fuel.
- The Environmental Protection Agency calculates that for distances of more than 1,000 miles, a system in which trucks haul containers only as far as the nearest railhead and then transfer them to a train produces a 65 percent reduction in both fuel use and greenhouse gas emissions.

Looking to future, the potential of a 21st Century rail system to improve national life is truly astonishing—including a near zero-emission, zero-oil freight transportation system. In a peer-reviewed study recently presented to the Transportation Research Board, the Millennium Institute, a nonprofit known for its expertise in energy and environmental modeling, calculated the likely benefits of a \$250 to \$500 billion expenditure on improved rail infrastructure. It found that such an investment would get 83 percent of all long-haul trucks off the nation's highways by 2030, while also delivering ample capacity for high-speed passenger rail. If high-traffic rail lines were also electrified and powered in part by renewable energy sources, that investment would reduce nationwide carbon emissions by 38 percent and oil consumption by 17 percent. By moderating the growing cost of logistics, it

would also leave the nation's economy 10 percent larger by 2030 than it would otherwise be.⁴

Electrified Railroads Using Renewable Energy Results in 2030 vs Business as Usual



Yet despite this astounding short- and long-term potential, almost all the focus on infrastructure spending these days is on building more “shovel ready” road and highway bridge projects—and at scale not seen in more than a generation. Soon we’ll be moving earth like it’s 1959.

This could be an epic mistake. We need to be funding projects that are not just shovel ready, but shovel worthy—projects that provide short-term stimulus without deepening our dependence on foreign oil or worsening pollution. Just as the Interstate Highway System changed, for better and for

⁴ A. Drake, A. M. Bassi and E. L. Tennyson, H. R. Herren, “Evaluating the Creation of a Parallel Non-Oil Transportation System in an Oil Constrained Future,” Millennium Institute, January 2009; http://www.millenniuminstitute.net/resources/elibrary/papers/Transportation_MI09.pdf, retrieved January 25, 2009. Presentation by Alan Drake, National Academy of Engineering, Transportation Research Board, 87 Annual Meeting, January 12, 2009; Correspondence with Andrea Bassi, Millennium Institute, January 22, 2009.

worse, the economy and the landscape of America, so too will the infrastructure investment decisions members of Congress and the President are about to make. The choice of infrastructure projects is *de facto* industrial policy; it is also *de facto* energy, land use, housing and environmental policy, with implications for nearly every aspect of American life going far into the future.

On the doorstep of an era of infrastructure spending unparalleled in the past half-century, we need to conceive of a transportation future in which each mode of transport is put to its most sensible use, deployed collaboratively instead of competitively. To see what that future could look like, let's again look to a concrete example, this time from the past.

The Lost Vision

At the beginning of the 20th Century, a “Good Roads” movement emerged calling for more paved highways. It was led by farmers and bicyclists, but railroads were strong supporters; they reasoned, logically enough, that with more paved roads, more people and goods could travel from greater distances to reach their lines. Farmers wouldn't get stuck in the mud trying to move their crops to market, but could use newly available trucks traveling on all-weather macadam highways to reach railheads. The Pennsylvania, Southern and Illinois Central railroads, among others, ran “object lesson trains” to small towns along their routes, carrying the men and materials needed to pave a short stretch of local roadway so the locals could see the possibilities. U.S. Senator J.W. Daniel, on hand to welcome one such train's visit to Lynchburg, Virginia in 1901, described it enthusiastically as “an itinerant college on wheels.”⁵

The vision of intermodal transport the railroads were seeking to promote made perfect sense. Rail transport lacks the flexibility of the rubber-wheel kind, but it has other advantages that make it far superior when the circumstances allow. The biggest is a unique quality of the technology itself. Steel wheels on steel rails meet with very little rolling resistance. They do not compress and absorb energy from the surface the way a tire does, and the rail itself is much smoother than any road, so trains have only about one-tenth the rolling resistance of trucks. And because of the way rails absorb and spread the weight of a vehicle over long distances, this advantage increases as freight is added. The more you load up a train, the more efficient it becomes compared to a fleet of trucks carrying the same cargo.

⁵ Stephen B. Goddard, *Getting There: The Epic Struggle between Road and Rail in the American Century*, (Chicago: University of Chicago Press, 1994) 52-53.



For long distance freight, the optimal energy and environmental benefits come when trucks haul containers only as far as the nearest railhead. Yet the U.S. lacks sufficient rail capacity to take full advantage of this intermodal strategy.

The Environmental Protection Agency calculates that for distances of more than 1,000 miles, a system in which trucks haul containers only as far as the nearest railhead and then transfer them to a train produces a 65 percent reduction in both fuel use and greenhouse gas emissions.⁶ As the volume of freight is expected to increase by 57 percent between 2000 and 2020, the potential economic and environmental benefits of such an inter-modal system will go higher and higher. Railroads are also potentially very labor efficient. Even in the days of the object lesson train, when brakes had to be set manually and firemen were needed to stoke steam engines, a five man crew could easily handle a fifty-car freight train, doing the work of ten times as many modern long-haul truckers.

In the first half of the last century, railroads used these and other advantages of steel wheel technology to provide services that in our own time seem

⁶ "A Glance at Clean Freight Strategies: Intermodal Shipping," Smartway Transportation Partnership, U.S. Environment Protection Agency, <http://epa.gov/smartway/transport/documents/carrier-strategy-docs/intermodal%20shipping.pdf>, retrieved January 25, 2009

futuristic. The rhythmically named Chicago Milwaukee, St. Paul, and Pacific (a.k.a Milwaukee Road) hauled hundred-car freight trains over the Rockies and Cascade Mountains using electric engines drawing on the region's abundant hydropower—a highly efficient, zero-emission freight transportation system that has no parallel in the United States today. The Railway Express Agency, which attached special cars to passenger trains, provided Americans with a level of express freight service that cannot be had for any price today, offering door-to-door delivery of everything from canoes to bowls of tropical fish to, in at least one instance, a giraffe. Into the 1950s, it was not uncommon for a family to ship its refrigerator to and from a lakeside cabin for the summer via the REA; thanks to the physics of steel-on-steel conveyance, appliance-sized items could be moved for not much more money than smaller goods. (Today, by contrast, many airline passengers must pay \$50 to check a suitcase of dirty clothes on a domestic flight.)

High-speed Railway Post Office trains also offered efficient mail service to even the smallest towns that is not matched today. In his book *Train Time*, Harvard historian and rail expert John R. Stilgoe describes the Pennsylvania Railroad's Fast Mail No. 11, which, because of its speed and on-board crew of fast sorting mail clerks, ensured next-day delivery on a letter mailed with a standard two-cent stamp in New York to points as far west as Chicago.⁷ Today, that same letter is likely to travel by air first to Fed Ex's Memphis hub, then be unloaded, sorted, and reloaded onto another plane, a process that demands far greater expenditures of money, carbon, fuel and in many instances even time than the one used 80 years ago.

The glory days of American railroads are now beyond the memory of most Americans. Rail service was already in decline during the Depression, and the gas rationing and logistical strains of World War II made train travel a standing-room-only horror. In large part because of that generational experience, most Americans came to believe the decline of railroads was an inevitable outcome of the march of progress. But the reality is close to the opposite. Especially for long-haul freight, steel wheel on steel rail is a far superior technology, and its eclipse by rubber wheels is mostly the result of special interest politics, ill-considered public policies, and other factors that have nothing to do with efficiency.

Manipulated by Wall Street and often badly managed, railroads were ultimately no match for the growing combination of interests—Standard Oil, General Motors, tire and asphalt makers—that grew into the auto-highway

⁷ John R. Stilgoe, *Train Time: Railroads and the Imminent Reshaping of the United States Landscape* (Charlottesville: University of Virginia Press, 2007), 43–49, 72–73;

complex. For decades, railroads were also slowly crippled by state and federal laws that forced them to run money-losing passenger trains and to keep on featherbedding employees rendered obsolete by new technology. Rail companies, as private-sector entities, remained responsible for maintaining their own infrastructure and for paying increasingly high property taxes on it, even as public money poured into highway and airport construction. And when railroads improved their efficiency, as they did substantially after World War II, they were often prevented by the now defunct Interstate Commerce Commission from passing the savings on to shippers, which resulted in further loss of market share to trucks.

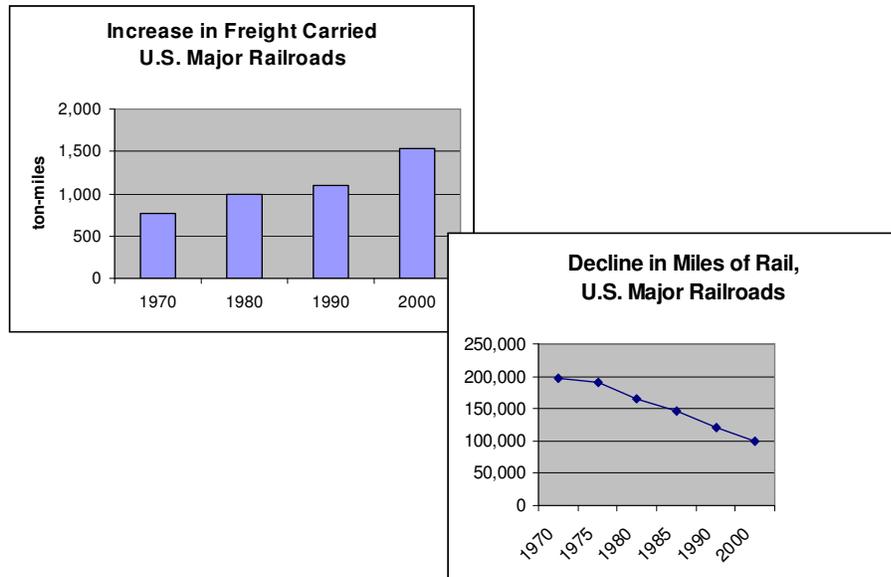
Many railroads died in the 1970s. At the beginning of the decade, the Erie-Lackawanna Railroad had moved very fast trains loaded with United Parcel Service vans on flat cars along its two-track, wide-clearance mainline stretching from Jersey City to Chicago—a model of intermodal transportation. But the railroad did not live to see the 1980s and now most of the line is abandoned. On the eve of the 1973 oil crisis, the proprietors of the Milwaukee Road ripped out its once state-of-the-art electrical wiring to raise cash. Much of the line is now a bike trail. By the start of 1980s, the federal government had eased some of the policy constraints on the railroads. Staggers Rail Act of 1980 for example, provided a substantial measure of price deregulation. But by then the damage was done. Thinking their industry was in terminal decline, many railroad managements continued to tear up tracks and use what little capital they had to diversify into new businesses, like theme parks, and in one instance, even mutual funds.

Starting in the late 1980s, however, something unexpected happened. As fuel and labor costs rose, and highway congestion worsened, more and more shippers started looking for an alternative to trucking. Once reduced to transporting mostly heavy, low-value commodities such as coal, railroads started gaining business in the transport of more time-sensitive, high value items—everything from Japanese computers to California wine—typically using containers double-stacked on flat cars. On routes where they still have adequate infrastructure, railroads have won back fantastic amounts of business from trucks, especially on long hauls such as Los Angeles to New York, where railroads now have a 72 percent market share in container traffic and could have more.

Railroads have gone from having too much track to having not enough. Today, the nation's rail network is just 94,942 miles, less than half of what it was in 1970, yet it is hauling 137 percent more freight, making for extreme

congestion and lengthening shipping times.⁸ Mostly because of time stuck in yards and sidings, the typical freight car in the United States has an average speed of only 2 to 7 mph.⁹

More and More Freight on Less and Less Track



The half-conscious decision by Washington, Wall Street and the last generation of rail management to abandon much of the rail system thus prevents railroads from getting more trucks off the road. For example, UPS desperately wants to use fast trains like the Erie Lackawanna once had to reduce the cost of moving parcels coast to coast in less than 4 days, a feat currently requiring a tag-team of truck drivers at enormous cost in fuel and labor. For a brief time in 2004, UPS did persuade two railroads to run a train fast enough to handle this business. But due to insufficient track to allow slower trains to get out of its way, the UPS bullet train caused massive congestion, freezing up the Union Pacific system for months until the railroad at last cancelled the service. Big trucking companies like J.B. Hunt,

⁸: *System Mileage Within the United States*, Bureau of Transportation Statistics, Table 1-1 http://www.bts.gov/publications/national_transportation_statistics/html/table_01_01.html, retrieved January 25, 2009; American Association of Railroads, <http://www.aar.org/PubCommon/Documents/AboutTheIndustry/Statistics.pdf>, retrieved January 25, 2009.

⁹ Roy Blanchard, "Does Speed Matter?" *Trains*, January 2009, p. 56.

meanwhile, have become the railroad's biggest intermodal customers, sending as many of their containers as they can by rail.

This raises the question, if so many shippers now want to use rail, why don't the railroads just build the new tracks, tunnels, switchyards, and other infrastructure they need to handle the business? In the wake of what we have learned in the last six months about how Wall Street works, the answer is clearer than it was before the financial breakdown. America's major railroad companies are publicly-traded companies answerable to global capital markets. While those markets were pouring the world's savings into underwriting credit cards and sub-prime mortgages on overvalued tract houses, America's railroads were pleading for the financing they needed to increase their capacity. And for the most part, the answer that came back from Wall Street was no, or worse. CSX, one of the nation's largest railroads, spent much of last year trying to fight off two hedge funds intent on gaining enough control of the company to cut its spending on new track and equipment in order to maximize short-term profits.¹⁰

So the industry, though gaining in market share and profitability after decades of decline, is starved for capital. While its return on investment improved to a respectable 8 percent by the beginning of this decade, its cost of capital outpaced it at around 10 percent—and that was before the credit crunch arrived. This is no small problem, since railroads are capital intensive, spending about five times more just to maintain remaining rail lines and equipment than the average U.S. manufacturing industry does on plant and equipment. Increased investment in railroad infrastructure would produce many public goods, including fewer fatalities from truck crashes, which kill some 5,000 Americans a year. Public goods, however, do not impress Wall Street. Nor does the long-term potential for increased earnings that improved rail infrastructure would bring, except in the eyes of Warren Buffet—who is bullish on railroads—and a few other smart, patient investors.

The alternative is for the public to help pay for rail infrastructure, or else pay in other ways. Unlike private investors, government must either invest in shoring up the railroads' overwhelmed infrastructure, or else see ever greater burdens placed on the public purse by increasing truck traffic. The American Association of State Highway and Transportation Officials (hardly a shill for the rail industry) estimates that, without public investment in rail capacity, 450 million tons of freight will shift to highways, costing shippers \$162 billion and highway users \$238 billion (in travel time, operating, and accident

¹⁰ "Hedge Funds Propose CSX Directors, Starting Proxy Battle," *New York Times*, December 20, 2007.

costs), and adding \$10 billion to highway costs over the next 20 years. “Inclusion of costs for bridges, interchanges, etc., could double this estimate,” their report adds. The additional costs of such externalities as increased environmental damage, oil dependency and adverse consequences to public health would be still greater.¹¹

Key Statistics: Health and Quality of Life

- In 2007, crashes involving large trucks killed 4,808 Americans and injured 83,908, according to the Federal Highway Administration.
- California’s Environmental Protection Agency has found that in that state alone, pollution from heavy trucks kills 1,500 people a year.
- The Reason Foundation projects that by 2030 peak-hour traffic congestion delays will rise 89 percent in urban areas with populations between 1 and 3 million.
- Frequently-cited mass transit critic, Wendell Cox estimates that diverting 25 percent of truck traffic to rail by 2025 would save the average peak-hour auto commuter in urban areas 100 hours a year in time not stuck in traffic jams.

¹¹ *Freight-Rail Bottom Line Report*, American Association of State Highway and Transportation Officials, <http://freight.transportation.org/doc/FreightRailReport.pdf>, p. 2, retrieved January 25, 2009.

Choke Points

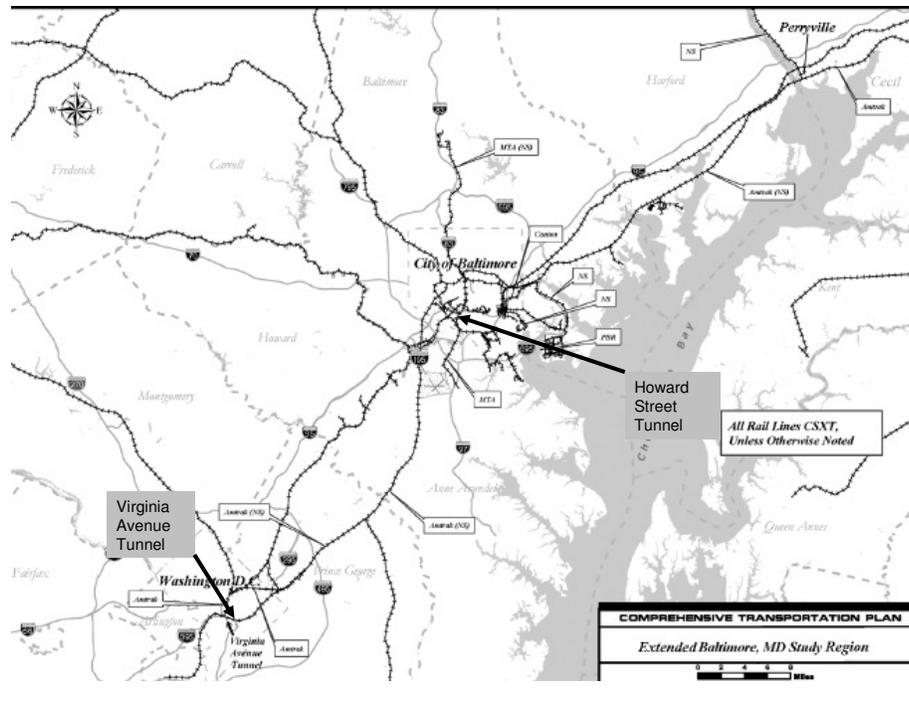
Begin with the small-scale projects that could bring short-term stimulus and long-term public gain. There are many examples around the country where a small amount of public investment in rail infrastructure would bring enormous social and economic returns. Why is I-95 so congested with truck traffic that drivers divert to I-81 and overwhelm that interstate as well? One big reason is that railroads can capture only 2 percent of the container traffic traveling up and down the eastern seaboard because of obscure choke points, such as the Howard Street tunnel in downtown Baltimore. It is too small to allow double-stack container trains through, and so antiquated it's been listed on the National Register of Historic Places since 1973. When the tunnel shut down in 2001 due to a fire, trains had to divert as far as Cincinnati to get around it. Owner CSX has big plans for capturing more truck traffic from I-95, and for creating room for more passenger trains as well, but cannot do so until it finds the financing to fix or bypass this tunnel and make other infrastructure improvements down the line. In 2007, it submitted a detailed plan to the U.S. Department of Transportation to build a steel wheel interstate from Washington to Miami, but no federal funding has been forthcoming.¹²

The Howard Tunnel is the worst of some 70 rail choke points in the Mid-Atlantic region alone. According to a study commissioned by the I-95 Corridor Coalition, a group of transportation officials along the highway's route, fixing these choke points would cost \$6.2 billion and return twice that amount in benefits. The returns would include \$2.9 billion in reduced freight transportation costs; \$6.3 billion in direct savings due to reduced highway congestion for vehicles still on the road, and \$3.7 billion in indirect economic benefits generated throughout the economy by these transportation savings.¹³

¹² U.S. Department of Transportation *Corridors of the Future Program Application, The Southeast I-95 Corridor*, CSX Corporation. May 25, 2007.
<http://www.vhsr.com/system/files/CSX+CFP+Submission.pdf>, retrieved January 25, 2009.

¹³ TESTIMONY OF NEIL J. PEDERSEN, Chair, I-95 Corridor Coalition, Administrator, Maryland State Highway Administration, Chair, AASHTO Policy Committee on Future Expansion of the Interstate System, On CONDITION AND NEEDS OF THE NATIONAL AND NORTHEAST TRANSPORTATION SYSTEM, before NATIONAL SURFACE TRANSPORTATION POLICY AND REVENUE STUDY COMMISSION, Field Hearing, New York City, Thursday, November 16, 2006.

Importantly, rail capacity can often be improved substantially by relatively low-cost measures such as adding signals, occasional switches and new, computerized train control devices, whereas with rubber wheel interstates the only way to add to capacity is to add lanes. This is another reason why the social rate of return on rail investment is much higher than on most highway projects.



The antiquated Howard Street rail tunnel in Baltimore, and the Virginia Avenue tunnel in Washington, are two choke points that prevent a major diversion of freight from trucks to rail along this corridor. From Maine to Florida, motorists travelling I-95 endure the effects, while manufacturers pay a price in lost competitiveness as well.

Another notorious set of choke points is in Chicago, America's rail capital, which is visited by some 1,200 trains a day. Built in the 19th century by non-cooperating private companies, lines coming from the East to this day have no or insufficient connections with those coming from the West. Consequently, thousands of containers on their way elsewhere must be unloaded each day, "rubber wheeled" across the city's crowded streets by truck, and reloaded onto other trains. It takes forty-eight hours for a container to travel five miles

http://www.i95coalition.org/PDF/Pedersen_I95Coalition_Commission_2006_Nov%2016.pdf,
retrieved January 25, 2009

across Chicago, longer than it does to get there from New York. This entire problem could be fixed for just \$1.5 billion, with benefits including not just faster shipping times and attendant economic development, but drastically reduced road traffic, energy use, and pollution.¹⁴

The Greening of America's Freight Transportation System

Removing choke points is the most immediate priority, because such projects offer both short-term economic stimulus and high rates of economic and social return. As Congress moves to toward comprehensive legislation on surface transportation later this year, however, we need to broaden our horizons. The potential costs in lost opportunities are enormous.

Electrification of major U.S. rail mainlines offers so many diverse potential benefits it might be characterized as the Swiss Army knife of public policy proposals. Start with the first order effects.

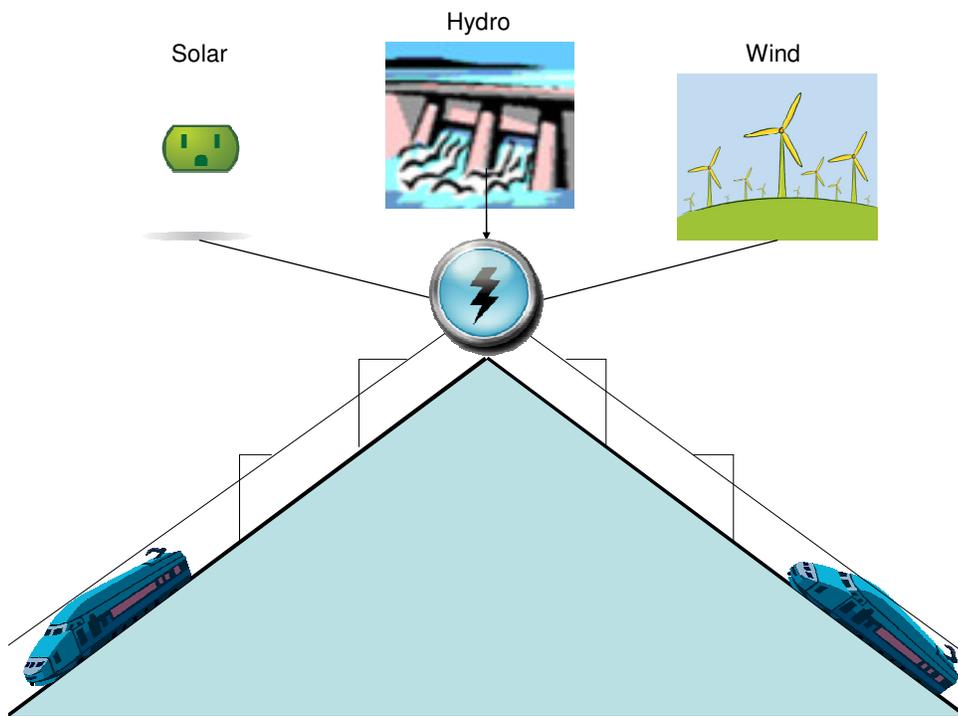


Drawing on electricity generated by hydropower, electric locomotives like this one once hauled 100 car trains over the Rockies and Cascade mountains, consuming no oil and producing no emissions. Electrifying America's mainline railroads using hydropower, solar, wind, and other renewable energy sources will provide "green jobs" and pay economic and environmental dividends far into the future.

¹⁴ Chicago Region Environmental and Transportation Efficiency Program (CREATE), homepage: <http://www.createprogram.org/>, retrieved January 25, 2009.

Today, most other industrial countries make extensive use of electric locomotives, and for good reason. They are 2.5 to 3 times more efficient than diesels, more powerful, and cheaper to maintain. They also last longer, accelerate faster, and have much higher top speeds. Running highly energy efficient trains carrying containers at 100 mph is easily achievable. SBB (SwissRail) is planning a new class of freight service operating at 100 mph on the same tracks as 150 mph passenger trains.

Electric Railways Can Take Full Advantage of Clean Energy



Electric railroads may be powered from any source, including emission-free renewable energy, and in many areas with very little loss in transmission. Through “regenerative” breaking, an electric locomotive descending a grade also converts otherwise wasted kinetic energy into electricity that helps power other trains on the grid.

Powered by an overhead wire or third rail, electric locomotives don't have to lug the weight of their own fuel around with them. Another remarkable feature is called “regenerative breaking.” Electric locomotives, when they brake, transfer their kinetic energy into electricity which is fed back into the

grid and used to power other trains. An electric locomotive braking down one side of a mountain, for example, sends energy to trains struggling up the other side. With all these advantages, electric railroads are fully 20 times more fuel efficient than trucks.

Rail electrification also offers significant opportunities for zero-emission freight and passenger transportation. Just as the Milwaukee Road's electrified line once used hydro-power to haul freight over the Continental Divide, today's major freight railroad could use electricity derived from renewable energy sources, including wind and solar. In fact, there is probably no more practical use for wind than using it to power "wind trains" running across the heartland. Most wind farms are and will be concentrated near rail lines in any event, because the large size of windmills makes them difficult and expensive to move by truck. There is also no loss of energy in transmission when windmills power passing trains—a big problem in other applications. Some companies are already exploring the possibilities: BNSF Railway, which traverses many wind zones, is investigating a deal by which it would lease space for power lines along its right-of-ways to utilities in exchange for access to discounted wind power for its trains.¹⁵

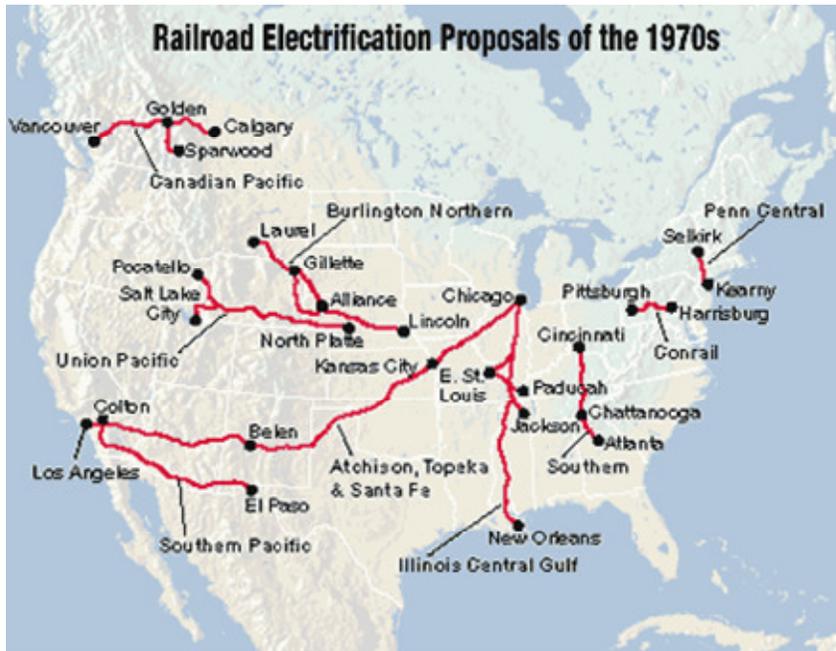
Much of the electrification could start almost immediately. In the 1970s, the National Academies of Science and many others concerned about that decade's energy crisis did extensive work in mapping out the specific lines most suitable to electrification. In 1977, at one of the many technical conferences on the subject, Milton J. Shapp, then governor of Pennsylvania, spoke for many of the visionaries involved when he observed that "particularly in view of the energy crisis, it is essential to the well being of our nation that our major railroads electrify."¹⁶ A temporary fall in oil prices and an abundance of short-term thinking killed almost every last project, but we still have benefit of all the studies sitting on shelves.

The work involved in constructing overhead wires, or catenary, requires unique skills, but one can imagine laid-off construction workers taking to it far better than, say, to nursing, and with less retraining. Current studies indicate that labor and construction costs would come to about \$2 million dollars per mile; maybe less if steel prices continue to sink. Wiring the 36,000 miles of mainline track on the nation's high-density routes would thus come in

¹⁵ William C. Vantuono, "Time to revisit electrification?" *Railway Age*, Sept, 2008. http://findarticles.com/p/articles/mi_m1215/is_ /ai_n29476448, retrieved January 25, 2009.

¹⁶ *Railroad Electrification : the Issues*, Washington: National Academy of Sciences, 1977.

at around \$72 billion. Completing such a project could take as little as 6 years, according John Schumann P.E. of LTK Engineering.¹⁷



Additional funds would be needed, of course, for new locomotives and generating capacity. But building or retrofitting locomotives to operate under the new grid could put lots of laid-off auto workers back to work. General Motors, until it sold off its Electro-Motive Division in 2005 to private investors, was long the nation's dominate diesel-electric locomotive maker. The spinoff company is still headquartered in LaGrange, Illinois, though most production has shifted to London, Ontario. General Electric, which remains a world leader in locomotive building, with a big plant in hard-pressed Erie, Pennsylvania, could also use the business and would bring much expertise to it. The plant recently suffered a layoff.

Financing the “Back on Tracks” Project

To say the federal government should invest in railroads is not to say it should own them. It's true that countries with nationalized railroad systems

¹⁷ Personal correspondence.

can take a broader view of the social value of railroad investment, which is why the Swiss, having voted to put all trucks crossing their country on to trains, are busy carving rail tunnels--one 35 miles long--through the Alps.¹⁸ But nationalizing U.S. railroads would bring with it all the problems attendant to genuine socialism, and buying out current shareholders would cost taxpayers a bundle. What the government should do instead is make creative use of public/private partnerships to fund more rail infrastructure and better integration of trucks and trains.

There are many ways this could be done. During the Great Depression, for example, the Reconstruction Finance Corporation offered loan guarantees to the Pennsylvania Railroad to electrify its lines between New York, Washington and Harrisburg, which brought such efficiency to the railroad that it was one of the few to avoid bankruptcy during the 1930s. (Amtrak's high-speed Acela service runs under the same wire today.) A national infrastructure bank--which many have proposed--could play the same role as the RFC is spurring rail infrastructure investment. Reduced capital gains taxes for investors in rail infrastructure could also help direct capital to where it is needed. Flat out grants, akin to federal highway money, would also be appropriate, since they would directly reduce the amount of money needed for highway construction and maintenance, not to mention all the other economic and environmental benefits.

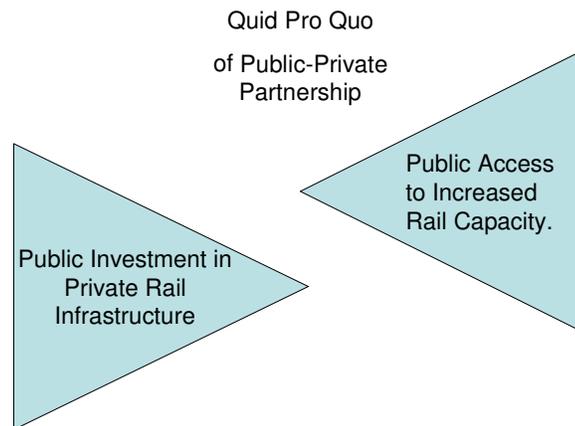
If the public helps railroads make these investments in electrification and other infrastructure improvements, it will of course earn important quid pro quos. Railroads, for example, could be required to apportion a certain amount of their increased capacity to public use, such as for commuter trains, which the railroads might or might not operate themselves (some show interest). It should also be possible to negotiate open access to publicly-financed rail infrastructure. This would allow outside companies to rent the rails and run their own freight, package express, fast mail, or passenger trains on them. It would also be a good check on any tendency toward monopoly pricing and provide for many other synergies as well.

In Great Britain, a subsidiary of Virgin Airlines called Virgin Trains operates passenger trains on publicly financed infrastructure, as do other private passenger and freight companies. Following this example would create something very much like the current interstate highway system: publicly financed transportation infrastructure maintained for the benefit of private operators. America's major railroads are wary of the full, open-access model

¹⁸ "Swiss dig world's longest tunnel," BBC News, 20 March 2007, <http://news.bbc.co.uk/2/hi/europe/6471241.stm>, retrieved January 25, 2009.

and want to retain ownership of their track. With the promise of enough public capital, however, and the threat of re-regulation, deals can be struck that will bring profound benefits across the economy.

For example, there is no reason we cannot again have fast, efficient express freight service of the kind the Railway Express Agency once provided. For cities as far apart as New York and Chicago, trains can beat planes on next day mail service. As consulting engineer Alan Drake points out, when passengers and express freight or mail are borne by the same train, the economics of passenger rail improve dramatically, making possible far wider service.¹⁹ We also have the chance to reduce drastically the cost and the huge carbon footprint caused by using trucks and planes almost exclusively to ship perishables across the country. Until the 1970s, railroads handled nearly all fresh food movement from California and Florida, and could again, making healthy winter fruits and vegetables cheaper, and less hard on the planet.



¹⁹ Alan Drake, Edson Tennyson, *Semi-High Speed Railroad: A Novel Cost-Effective Approach for Passengers and Express Freight*, forthcoming. Alan_Drake@Juno.com; ESTennyson@Cox.net.

Ancillary Benefits of a “Steel Wheel Interstate” System

- Consumers save due to reduced auto commuting costs and reduced freight transportation costs.
- Express freight and parcel delivery becomes cheaper, particularly for heavy items, and more energy efficient. Mid-size American cities receive better logistical services.
- Transport of most perishables, such as fruit and vegetables from California or Florida, no longer requires heavy use of long-haul, heavy trucks.
- Facilitates the coming of true high-speed railroad passenger service and the expansion of conventional passenger, commuter, and auto trains.
- Facilitates the rebuilding of America’s manufacturing base by reducing the cost of moving both commodities and finished goods.
- Lowers the amount of greenhouse gas reduction needed from other sectors of the economy to achieve overall emission targets.

Another potential use of steel wheel interstates would be auto trains. Today, Amtrak offers a service that allows motorists to drive their cars onto special auto racks that are attached to the back of a passenger train. The train runs daily between Northern Virginia and Central Florida, saving users 855 miles of driving down I-95. The service is particularly popular among northern “snowbirds” who spend the winter in Florida and want to have their cars with them. For now, this is a specialty market, and it is not cheap because of the energy required to haul the weight of the automobiles. But with the potential energy efficiency of an electrified steel wheel interstate system, auto trains could make sense in many markets, whether run by Amtrak or private firms.



Switzerland's "Rolling Highway." Drivers sleep in a coach attached to the train while traversing the Alps and taking their mandatory hours of rest.

A similar service might also appeal to remaining independent long-haul truckers (we'll still need some for transport of time-sensitive cargo to and from remote locations). In Europe, a company called HUPAC offers a service known as "the rolling highway." By attaching a coach to the end of its container trains, it allows drivers to rest as they and their rigs traverse the Alps. Truckers in this country, before exceeding their daily legal maximum of 11 hours behind the wheel, could load their rigs onto a rolling highway and get some nine hundred miles down the road while they took their mandatory 10 hours rest.²⁰

Is all this politically feasible? Certainly more so than a year ago, before the consensus formed that we must invest massively in infrastructure of some kind. Importantly, too, we're not talking about bailing out a failing industry, but about helping an expanding, more energy efficient one to grow fast enough to meet pressing public needs. Nor would we be making big bets on unproven technology. Also, it is important to remember that big trucking companies, facing acute driver shortages and increasing highway congestion, are increasingly shifting their containers to rail and so have an interest in improved rail infrastructure. With trucking companies morphing into logistics companies, it's a new day in the special interest politics of freight.

²⁰ HUPAC webpage, *Rolling Highway: Switzerland the Relaxing Way*.
http://www.hupac.com/en/index.php?p=prod_autostrada&mt=2, retrieved January 25, 2009.

Finally, the proposal has an additional political advantage: it does not involve pricing or guilt tripping people out of their automobiles. Electrifying and otherwise improving rail infrastructure would indeed facilitate the coming of true high-speed rail passenger service to the United States, a goal President Obama committed to as a candidate. Its success, however, would not depend on persuading a single American to take the train instead of flying or driving. This is change we can believe in•