

1. Appropriate strategies for funding freight transportation investments.

RAIL Solution advocates a national Steel Interstate System of high-capacity, grade-separated, electrified rail corridors capable of handling both freight and passenger trains at highway speeds. The Steel Interstate can pay for itself by substituting economical domestically generated electricity for costly imported oil. The core national network would be about 30,000 miles, and as it is built out in coming decades and more and more commerce shifts to the Steel Interstate, annual benefits will grow, with billions of dollars retained here in the U.S. for jobs and economic growth that now get exported to the Middle East. A one-percent increase in electricity generation can save seven percent of the nation's current oil consumption.

The Steel Interstate envisages freight and passenger trains sharing rights of way mostly supplied by upgrading existing main line rail corridors. We call this the Swiss model, where adequate capacity is provided to move both freight and passengers with speed and reliability at speeds up to 120 mph (200 kph). For true high speed rail (HSR) passenger trains, dedicated rights of way will be required for speeds over 120 mph. This is not what the United States needs at the moment. It is far more important to get 80% of our land transportation onto an electrified Steel Interstate System. That's where the payoff lies. Most passengers will be fully satisfied with ubiquitous, dependable service under 120 mph. If someday a demand arises in specific densely populated corridors for true HSR, those operations will have to be funded by State and Federal governments. Nowhere in the world are HSR operations self-supporting, and initial capital costs are very high.

2. Issues, concerns and challenges of shared-use rights of way.

Shared use by passenger and freight trains is fundamental to the Steel Interstate concept. Today's shared use is contentious and performance is poor, because inadequate capacity plagues the rail system and both services cannot operate reliably on such a constrained network. The Steel Interstate would assure adequate capacity in the national core network so that both freight and passenger trains could operate reliably.

Nevertheless, the primary challenge will continue to be how to blend public and private investment in a Steel Interstate System. Railroads may resist this kind of national rail upgrade program, in spite of its many benefits, because of perceived erosion of their private property rights and loss of ability to control access to their systems. These fears are often characterized as "open access." As corridor by corridor upgrade plans are worked out, detailed public/private partnership agreements will be needed between the public sector making much of the initial investment and the private carriers currently owning the



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infrastructure. Such negotiations may be difficult, especially at first, because there is no model or pattern for such large-scale public investment in a private enterprise. However, if each corridor plan is viewed as a new venture unto itself, the interests of both public and private participants should be able to be protected. Railroads could get credit in the structure for all their existing infrastructure value; the public sector could get credit for all the new investment. The result will be a network of exemplary rail operating corridors with some percentage of public and private joint involvement in each one. Each venture would specify terms of use, rates of compensation, and control of dispatch, but as long as users comply with such terms, trains could not be refused. Once a few agreements have been done, a template will emerge to guide future projects.

3. What governance issues should be considered?

In the National Rail Plan the Federal Railroad Administration needs to take a leadership role. Crafting a national plan that is consistent with State Rail Plans is a legal requirement, but it is a minimum standard that FRA is free to exceed. FRA needs to present a consistent national vision for the future of rail transportation in the United States that goes beyond each state's more parochial concerns reflected in their respective State Rail Plans. There is no way the individual states can project this kind of national vision independently. Issues such as energy independence, emissions reduction, national security, and preparing the nation for Peak Oil cannot be dealt with effectively by 50 separate states. They demand a national focus.

When oil is no longer abundant or affordable, for example, the nation's mobility of goods and people, on which we are so dependent for sustaining our lifestyle, will be in serious jeopardy, and the national economy could suffer serious reverses with no plan in place to cope. The individual states cannot do this. There is a reason that the U.S. Constitution specifically reserves to the Federal Government power over interstate commerce. The Founding Fathers envisaged the pandemonium that would result from each state making key transportation decisions separately. That is still true today. While each State Rail Plan needs to detail how to meet the rail transportation needs of that state, the National Rail Plan needs to set forth a consistent national vision and goal to guide planning and infrastructure goals for the nation as a whole.

4. What issues should be considered in network design and development?

A core national network of Steel Interstate corridors can be illustrated and suggested by overlaying the maps of others. The Department of Defense (DOD) has outlined its strategic rail network needs for the future in the STRACNET, totaling over 32,000 miles. The National Association of Railroad Passengers (NARP) has advanced its vision for a future national passenger train network of



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about 40,000 miles in its Grid and Gateway map. The two maps are remarkably consistent. FRA has advanced its own categorization of future high-speed rail corridors. A national Steel Interstate System can meet all these needs. Connectivity is vital. As the network is determined and construction begins, attention must be given to interchange of freight shipments with the secondary rail network that will continue to perform local and regional yard and switching operations. Passengers on the main routes must be able to connect easily and conveniently at cities with local rail transit routes and bus lines to service destinations within the metropolitan areas.

5. Identify areas where transportation safety can continue to improve.

Because Steel Interstate corridors would feature fast and frequent train operations, state-of-the-art signaling and positive train control are important in assuring safe operations with minimum headways. A hallmark of Steel Interstate design is grade separation. This will greatly improve safety by eliminating grade crossing accidents, as well as enhancing public acceptance by eliminating grade crossing delays.

No significant issues affect shared rights of way by freight and passenger trains. This is widely done today in other countries, and, to a limited extent, in the U.S. We are not aware of data showing that public safety is compromised by shared use of track and facilities. No effort has been made to separate cars and trucks on the nation's Interstate Highway System, though the safety issues there of mixing large trucks and much smaller cars are far more profound. Diverting most medium- to long-distance trucking from highways to rail is key to the energy savings of the Steel Interstate, but it would also immeasurably improve the safety and driving experience on our highways.

6. How can the rail system effectively meet defense, emergency, and security requirements?

DOD's STRACNET requirements can be fulfilled with the Steel Interstate. It provides a core national network of high-capacity rail lines capable of handling the large volume freight and troop transport needs of American military logistics. The same is also true for domestic emergency situations such as hurricane evacuation. Having adequate capacity to permit fluid train operations is vital for any emergency response.

Nothing is more fundamental to our national security than reducing our now near-total dependence on oil for the transportation sector. Alan Drake is an engineer and researcher for the Association for the Study of Peak Oil and Gas, a non-profit research and public education initiative to address U.S. peak oil and energy challenges [www.aspo-usa.com] and the Millennium Institute



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[www.millennium-institute.org] a foundation for world sustainability. He argues convincingly that a reduction of 6 to 7 million barrels per day over 24 to 30 months would cause U.S. food distribution to become erratic and the national economy to collapse. A nation can be defeated through economic collapse as truly as on the battlefield. International geopolitical scenarios are possible that could produce the protracted decline in oil availability hypothesized by Drake, including coordinated action by the Arab producing nations and military interdiction of the Straits of Hormuz or Malacca.

Another likely cause is that in a post-Peak Oil world, producing nations will naturally begin to preserve more domestic production for current and future domestic use, especially since the economies of many such producing nations are booming. Mexico, for example, is approaching the point of ceasing oil exports to meet domestic demand. Such hoarding can be expected to cause world oil exports to fall even more rapidly than world oil production. Energy economists refer to this as the Export Land Model, and it has been increasingly discussed and debated in recent years. Alan Drake states that in his opinion, “this is the most likely scenario and a very real threat to national security - even survival.”

While some may see such scenarios as alarmist, others will see them as realistic concerns. For the most part, the difference is not if, but when, they will hit us. A massive capital spending program on long-lived infrastructure that helps eliminate oil use is a nearly ideal economic stimulus. The majority of spending would be for domestic goods and services. The Steel Interstate System meets this need.

Oil production worldwide likely has peaked. The Hirsh Report surveyed opinions on this from many petroleum geologists, and the majority said peak world production had occurred or would occur by 2010. [Peaking of World Oil Production: Impacts, Mitigation, & Risk Management, by Robert L. Hirsch, Roger Bezdek, and Robert Wendling, U. S. Department of Energy, February, 2005. See: http://www.netl.doe.gov/publications/others/pdf/Oil_Peaking_NETL.pdf]

Some of the Hirsh Report’s findings have direct relevance to the Steel Interstate System:

“Oil peaking will create a severe liquid fuels problem for the transportation sector”

“As peaking is approached, liquid fuel prices and price volatility will increase dramatically, and, without timely mitigation, the economic, social, and political costs will be unprecedented. Viable mitigation options exist, but to have substantial impact, they must be initiated more than a decade in advance of peaking.”



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“Aggressive, appropriately timed fuel efficiency and substitute fuel production could provide substantial mitigation.”

Of course, there is no better way to substitute fuel than through electrification. Other commonly mentioned methods, such as shale oil, tar sands, and coal liquefaction face production bottlenecks, environmental problems, or both, making them unsuitable candidates for widespread oil substitution.

World population, and oil consumers, continue to grow. On a per-capita basis world oil production peaked several decades ago. New emerging demand from nations such as India and China, and resulting upward price pressures in recent years, illustrate dramatically this emerging national crisis. Just this month China has been in the news trying to lock up Venezuelan oil production.

We need to wean ourselves from imported oil. We need to begin now the critical national planning required to move goods and people in coming decades when oil becomes prohibitively expensive and ultimately non-available as a transportation fuel. Substituting domestically produced electricity is the key. There are no technical barriers to railroad electrification. The technology is available today and widely used around the world. The Steel Interstate brings it home to America.

7. What are the land use issues that must be considered in making transportation infrastructure investments? How can rail promote livable communities?

The primary potential for rail to benefit proper land use and livable communities is by moving mid- and long-distance truck freight from congested highways and avoiding construction of still more new road capacity. Railroads have a far smaller footprint on the land, and a single-track railroad can be rebuilt as a double-track line in as little as twenty feet of right of way, increasing capacity by far more than 100%. Adequate right of way often exists within current railroad property holdings to provide for such expansion. Doubling Interstate Highway capacity, by contrast, often results in proposals for replacing four lanes with eight lanes, requiring several hundred feet of new right of way and hugely detrimental environmental impact on surrounding lands and communities. Rail expansion is always preferred where highway construction is prohibitively expensive or environmentally ruinous.

Another contribution to livable communities results from replacing auto dependency. Proper planning and design of rail facilities can result in easy connectivity between intercity trains and local transportation pick-up and distribution networks.



8. What opportunities does rail provide to improve energy use and the environment?

The Steel Interstate can save 7% of all the oil used in the U.S. today; total oil, not just used in the transportation sector. It can do this using instead only a 1% increase in electrical generation nationwide. That not only relieves dependence on foreign oil, but introduces a full range of alternative fuels used to generate the electricity. The 1% is small enough that it could be provided from renewables or accrued through conservation efforts. In addition the Steel Interstate's rights of way could double as transmission corridors to move wind energy from remote producing areas to major urban markets.

The increased efficiency of rail makes all this possible. Shifting most of the mid- to long-range truck-hauled freight to rail makes this transportation possible at far lower energy consumption. There are also other incremental efficiency increases enjoyed by electric traction over today's diesel-hauled trains. Currently many energy-reduction programs are supported by government, including building insulation, CAFE standards for automobiles, and telecommuting, to name a few. Energy savings from the Steel Interstate is more than all these government programs combined.

Less energy consumed means less fuel burned means less pollution and greenhouse gasses produced. Lower pollution not only has meaningful health benefits, but it can contribute to lowering the impact on climate change. Rail is a cleaner, greener, healthier, and safer means to move freight. A major shift from moving most long-distance freight via highway to rail instead offers enormous public benefit but requires substantial increases in rail capacity not available today. Infrastructure investment in a high-capacity, grade-separated, electrified Steel Interstate System makes it all possible.

9. What are the opportunities and challenges for professional capacity building?

Many professional skills and production capacities necessary to build out a national Steel Interstate System are lacking in the United States today. But they are routinely available elsewhere in the world where sophisticated electrified rail operations are commonplace. At the outset, some of these skills and capabilities will have to be emulated from abroad and established in the U.S. Professional skills are transferable. Engineers and contractors who have designed and built highway systems for 50 years can cross-train to building railroad infrastructure. Many of the same talent used, for example, to design and build highway bridges can be put to work designing and building railroad bridges and working on the many grade separation projects that the Steel Interstate will involve. Locomotive builders who have specialized for decades in diesel units,



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can switch plants to designing and producing electrically-powered units. After a few years a whole new tier of skills and industrial capacity will evolve to support the new railroad growth here just as it has in other countries around the world.

10. How can infrastructure project delivery be expedited and costs controlled?

There are no easy answers to these questions. Expedited delivery depends on getting started as soon as possible. Many barriers stand in the way. Some of these have been detailed in other answers above, such as funding and negotiations with today's Class I rail carriers. The steps may entail difficulties, but the sooner we get started resolving the barriers, the sooner we can get started building new rail capacity for the nation.

Costs can best be controlled by competitive bidding. With current high national unemployment and unused production capacity, labor and capital can be recruited for a Steel Interstate System at competitive rates. People want jobs and contractors need work. This represents a propitious time to launch a bold new national transportation infrastructure initiative that will create sustainable jobs and production in America for years to come. This is not a flash in the pan stimulus concept. The Interstate Highway System took 50 years to reach substantial completion. The Steel Interstate can likewise boost domestic production and employment for decades to come. The best part is that we can pay for it through savings in reduced purchases of foreign oil, spending the money here at home instead of in the Middle East. This dividend is paid year after year, an amazing catalyst to job growth and economic development, while at the same time producing a world-class rail system for America.

