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### Observation 1. DAs Are Non-Unique

#### Obama Just Fought to Pass a Massive Transportation Spending Bill

Los Angeles Times ‘12

Updated 11:01 p.m., Friday, June 29, 2012 Transportation bill OKd, student loan hike halted

Congress, in a rare display of bipartisanship, on Friday sent to President Obama a $105 billion transportation bill that lawmakers from both parties touted as perhaps the largest jobs measure of the year. The measure also would avert a doubling of interest rates for millions of college student loans that was threatened to hit Sunday. The first major transportation bill since 2005, the legislation would keep highway and transit spending at current levels through the end of fiscal year 2014. It includes an expansion of a federal loan program sought by a group of U.S. mayors to fast-track bus and rail projects in traffic-choked regions. The House approved the bill by a lopsided 373-52 vote, demonstrating the power of pothole politics. The Senate approved it 74-19. The bill would provide financial incentives to states that crack down on distracted driving, require ignition interlock devices for DUI offenders and establish graduated licensing programs that restrict teenagers' driving privileges. It also would impose new safety rules on interstate passenger buses in response to a number of high-profile tour bus crashes. "We have a bill that will boost this economy," said Sen. Barbara Boxer, D-Calif., a sponsor of the bill who said it would create or save 2.8 million jobs. The bill's passage came only after lawmakers once again faced deadlines - a shutdown of the highway program Saturday and a doubling of student interest loan rates Sunday. Lawmakers also did something unusual for this Congress: They compromised. Republicans, in the face of White House opposition, dropped an effort to use the bill to try to advance the controversial Keystone XL pipeline.

#### And, Economy Tanked, No Recovery Coming

Alter 6/2

 Diane, Contributing Writer, Money Morning, "Are we headed straight for Recession 2013?" 6/2/12 moneymorning.com/2012/07/02/are-we-headed-straight-for-recession-2013/ AD 7/2/12

Fresh reports pointing to a slowdown in the struggling U.S. economy, coupled with worries of Europe's fiscal woes, have experts warning that Recession 2013 is inevitable. The dismal and downtrodden jobs numbers, the elevated long-term unemployment levels, the ailing housing market and the looming "fiscal cliff" are all fueling recession fears. Just last month, the nonpartisan Congressional Budget Office reported that unless lawmakers move to avert scheduled tax increases and spending cuts at the end of this year, a recession is likely. This marked the first time the CBO has forecast a recession resulting from the fiscal cliff. The CBO projected that gross domestic product (GDP) will contract by 1.3% in the first half of 2013 before growing 2.3% later in the year. Annualized, GDP would grow just 0.5% in 2013. That forecast is an about face from January when the CBO forecast a 1.1% GDP growth in 2013 (if policies are not dealt with). The report stated, "Given the pattern of past recessions as identified by the National Bureau of Economic Research, such a contraction in output in the first half of 2013 would probably be judged to be a recession." Now other economic experts are saying the same. Recession 2013: A Popular View Even Fed Chief Ben Bernanke has warned that shocks from the scheduled changes will most probably cause the economy to contract, resulting in a recession. "It's very important to say that, if no action were to be taken by the fiscal authorities, the size of the fiscal cliff is such that I think there's absolutely no chance that the Fed could or would have any ability to offset, whatsoever, that effect on the economy," said Bernanke. "I am concerned that if all the tax increases and spending cuts that are associated with current law would take, absent congressional actions...that'd be a significant risk to the recovery." Legendary investor and commodities guru Jim Rogers also chimed in and said the country's massive debt load will plunge the U.S. into a recession in 2013. Rogers added that the Fed is only making the situation worse. "Every four to six years since the beginning of the Republic, we've had economic slowdowns, we've had recessions. Always. It's coming again," Rogers said in an interview with Newsmax TV. "You can add as well as I can-in 2013 or 2014, we've going to have another slowdown, whether it's caused by Europe or who knows what is going to cause it, but it's coming."

#### PLAN: The United States federal government should invest in public-private partnerships to develop a national electrified railroad infrastructure system.

### Observation 2. Imminent Doom

#### A. Infrastructure Collapse

#### Total Collapse of Freight Rail System Coming Without Substantial Infrastructure Investment

Hamberger ‘8

STATEMENT OF EDWARD R. HAMBERGER PRESIDENT & CHIEF EXECUTIVE OFFICER ASSOCIATION OF AMERICAN RAILROADS BEFORE THE U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE SUBCOMMITTEE ON RAILROADS, PIPELINES, AND HAZARDOUS MATERIALS HEARING ON RAIL CAPACITY APRIL 23, 2008 Association of American Railroads 50 F Street NW Washington, DC 20001, <http://republicans.transportation.house.gov/Media/File/Testimony/Rail/04-23-08-Hamberger.pdf>

As the National Surface Transportation Policy and Revenue Study Commission noted in a recent report, “Congestion [is affecting] every mode of surface transportation for ever lengthening periods each day, as a result of the mismatch between demand and supply of limited capacity.”1 To be sure, there is a tremendous amount of strength and flexibility in our nation’s transportation systems, and the freight is still being delivered by all of the modes. But it is clear that all freight transportation modes are facing capacity challenges today.Freight railroads face capacity challenges thanks largely to substantial and sustained increases in rail traffic. From 1990 to 2006, Class I tons originated rose 33 percent, carloads originated rose 47 percent, car miles rose 49 percent, and revenue tonmiles rose 84 percent. In each successive year from 1998 through 2006, Class I railroads originated more tons than ever before. Beginning in 2002, they moved more carloads in each year than ever before. Growth in intermodal traffic has been especially rapid. Beginning with the second quarter of 2002, U.S. rail intermodal traffic rose for 20 consecutive quarters, sometimes by doubledigit amounts compared with the same period in the previous year. There was a slight decline in rail traffic in 2007, due mainly to the severe problems in the housing and automotive sectors. Even so, railroads operating in the United States moved more freight in 2007 than in any previous year except 2006. As a result of these substantial traffic increases, average freight rail traffic density has increased sharply. Just from 1990 to 2007, Class I car-miles per mile of track owned rose approximately 82 percent; revenue ton-miles per mile of road owned rose some 118 percent. The increase in traffic and traffic density have led to capacity constraints on some rail corridors and points on the rail network. Railroads may differ in the degree to which their capacity is constrained, but there is no question that there is much less room on the U.S. rail network today than there was even a few years ago. In recent years, solid growth in the economy (the current slowdown notwithstanding) and population, improved rail service offerings, expanding international trade, increasinglycongested highways, sharply higher fuel prices, and other factors have pushed more and more freight to railroads. Even when taking into account the current lessened traffic demand due to the present economic conditions, analysts generally expect market forces to continue to encourage more freight to move by rail in the years ahead. As a result, the long-term forecast is for freight rail traffic to trend steadily higher. For example, Global Insight recently projected a 28 percent increase in U.S. freight rail tonnage from 2006 through 2018. The U.S. Department of Transportation recently forecast that freight railroad demand will rise 88 percent by 2035. If the increase in rail traffic in the 15 years following 2006 simply matches the rate of growth over the 15 years prior to 2006, by 2021 Class I carriers will be originating approximately 41 million carloads — up from 32 million in 2006. The magnitude of the looming freight rail capacity issue was also borne out by a recent study by Cambridge Systematics, a prominent economic and transportation consulting firm. The purpose of the study, which focused on 52,000 miles of primary rail corridors, was to estimate the cost of the expansion in capacity necessary for U.S. freight railroads to handle the 88 percent increase in freight rail traffic forecast by the DOT for 2035, assuming no gain in rail’s market share of intercity freight movements. The study found that if rail capacity needs are not properly addressed, by 2035 some 16,000 miles of primary rail corridors — nearly one-third of the 52,000 miles covered in the study — will be so congested that train flows would be unstable and congestion and service delays would be persistent and substantial. Because the rail system is so interconnected, this outcome would mean that the entire U.S. freight rail system would become, in effect, disabled. The significance of the network aspects of rail operations cannot be overemphasized. As rail lines are operated at or near full capacity, efficiency (including operational predictability) becomes more critical. Service disruptions caused by inefficient asset utilization can have impacts not only on the railroad involved but potentially throughout the entire rail network. All of this means that the characteristics of the U.S. freight railroad industry today are significantly different than they were in the past, when traffic levels were much lower and capacity was rarely an issue. The rail network faces capacity challenges now and could face a capacity crisis in the future if the necessary investments are not made. Looking ahead, as their traffic continues to grow, railroads will increasingly need to concentrate on building new capacity and finding ways to better utilize their existing capacity — while continuing to maintain existing capacity at high standards.

#### Railroads key to food prices- disruptions cause shocks

**Weinstein 98** (THE IMPACTS OF THE UNION PACIFIC SERVICE DISRUPTIONS ON THE TEXAS AND NATIONAL ECONOMIES: AN UNFINISHED STORY Prepared for the Railroad Commission of Texas by Bernard L. Weinstein, Ph.D. and Terry L. Clower, Ph.D. Center for Economic Development and Research The University of North Texas Denton, Texas February 9, 1998)

In 1996, the value of U.S. crop production totaled $86.3 billion, and the cost of transporting these crops to food processors was approximately $4 billion. For the state of Texas, cash receipts to farmers totaled $5.3 billion in 1996 and transportation costs came to about $250 million. As with chemicals, **the nation's farmers** and grain shippers **depend** largely **on the railroads to get their crops to markets, both domestic and foreign. Agricultural shippers** and receivers generally **have limited access to alternative providers of transportation services because many are located beyond effective trucking distances from these markets.** In addition, western growers and shippers have little access to waterway transportation, with the result that **up to 80 percent of grains and cereals are shipped by rail** in some states. Grain shipments by the Union Pacific have slowed markedly in recent months. According to Association of American Railroads, the UP loaded 6,104 rail cars with grain during the first week of November-- 41 percent less than the 10,343 for the same week a year ago. The Burlington Northern, partly because of the UP tie-ups, has also seen a drop-off in grain shipments-- 8,475 cars per week versus 10,892 a year ago. Some elevator operators report waiting 30 to 60 days to receive rail cars. During the STB's October 27 hearing, the National Grain and Feed Association reported that grain elevators were filled to capacity, particularly in Kansas, Oklahoma and Texas, and that local cash prices were declining because of a lack of storage. At both the STB and RRC hearings, some shippers cited numerous instances of rail cars that had been loaded with grain and billed but were sitting idle on their tracks for weeks because the Union Pacific was unable to provide locomotive power (see testimony of David Swinford, Ft. Worth hearing, pp. 7-9). Members from the Texas Panhandle reported that some customers were refusing to buy Texas-origin grain for fear of not receiving timely shipments (see testimony of Art Smith, El Paso hearing, pp. 2-3). **Disruptions of agricultural shipments have also been felt in South Texas, where delays of two to four weeks for hopper cars have been common** (see testimony of William Lock, Corpus Christi hearing, pp. 1-2). Movements of rice, corn, milo, soybeans and cotton have been slowed, imposing additional pressures on farmers and co-ops in the face of bumper crops and low prices. As of mid-December, **grain deliveries** by the Union Pacific **were falling further behind schedule**. These increasing delays prompted the Surface Transportation Board to order UP and the Burlington Northern Santa Fe Corporation to set up a system to minimize spoilage and get 1997's record grain harvests moving. During the late fall, more than 50,000 carloads of grain typically flow through Texas Gulf Cost ports on their way to foreign markets. Undoubtedly, exports through these ports will be lower in 1998 because of the cumulative impacts of UP's service disruptions (see discussion of international trade below). **A conservative estimate of the losses incurred by** Texas' **farmers** and grain shippers from lower prices, foregone sales opportunities and higher freight costs **is $150 million** to date. **These higher costs** may **eventually show up at the dinner table**, not only for households in Texas but **in all** other **parts of the U.S.** as well.

#### That kills billions

**Tampa Tribune 96** (January 20, LN)

"Even if they are merely blips, **higher international prices can hurt poor countries that import a significant portion of their food**," he said. "**Rising prices** can also **quickly put food out of reach of the 1.1 billion people in the developing world** who live on a dollar a day or less." He also said **many people in low-income countries already spend more than half of their income on food.**

#### And, freight rail transportation key to readiness—speed of equipment and personnel deployment

FRA, 9

(Federal Railroad Administration, October 2009, “Preliminary National Rail Plan”, http://www.fra.dot.gov/downloads/railplanprelim10-15.pdf)

Greater use of passenger rail and freight rail holds the promise of improving our national transportation systems, reducing congestion, and diminishing petroleum use while improving the environment. These benefits enhance the livability of communities. Thus the benefits of expanded freight and passenger service to communities should be an important consideration when developing rail projects. In assessing total costs, States should consider both the community benefits and the potential community costs in developing their plans. Carefully planned economic development can also help to alleviate the recurring problem of benefits being enjoyed by one community while the costs are passed on to another, as well as “not-in-my-backyard” issues. Strategies and best-practice approaches must be developed to resolve these issues and to ensure that local concerns are addressed as regional and National needs are obtained. Effectively meet Defense and Emergency Transportation Requirements Rail transportation is important to the national defense strategy because the military’s heavy and oversized vehicles need to move by rail to seaports for deployment. The Department of Defense (DOD) has emphasized the need for rapid deployment of large numbers of people and huge amounts of materials on short notice. Similarly, following a natural disaster, rail transportation is critical to ensuring the safe evacuation of affected populations and to assisting local, State, and Federal officials in rebuilding devastated communities. Deployment of personnel, equipment, and supplies for defense and emergency relief operations requires a well planned and flexible rail network with the capacity to absorb additional traffic should the demand arise.

#### Only military readiness prevent war—perception of weakness causes hostile first strike

Spencer, 2000

(Jack Spencer, Policy Analyst for Defense and National Security, September 15, 2000, Heritage Foundation, “The Facts About Military Readiness”, http://www.heritage.org/research/reports/2000/09/bg1394-the-facts-about-military-readiness)

America's national security requirements dictate that the armed forces must be prepared to defeat groups of adversaries in a given war. America, as the sole remaining superpower, has many enemies. Because attacking America or its interests alone would surely end in defeat for a single nation, these enemies are likely to form alliances. Therefore, basing readiness on American military superiority over any single nation has little saliency. Military readiness is vital because declines in America's military readiness signal to the rest of the world that the United States is not prepared to defend its interests. Therefore, potentially hostile nations will be more likely to lash out against American allies and interests, inevitably leading to U.S. involvement in combat. A high state of military readiness is more likely to deter potentially hostile nations from acting aggressively in regions of vital national interest, thereby preserving peace.

#### Railroad congestion collapses US transcontinental shipping and destroys trade credibility

**Gallagher ‘5** (Traffic World March 14, 2005, Monday SECTION: RAIL; Pg. WPLENGTH: 1530 words HEADLINE: Derailing the Economy BYLINE: JOHN GALLAGHER - ASSOCIATE EDITOR)

**Rail service shortfalls**, high rates are hindering shippers' ability to expand reach, scope of products, businesses. **The inability of the** North American **rail system to meet the demands of a growing number of customers is nearing a critical point**, **threatening to put the brakes on an economic engine** hungry for more fuel and limit growth. With rail capacity stretched to never-before-seen limits, shippers across the United States and Canada said in a series of interviews that **rail service shortfalls are having an unprecedented impact on** their **planning and their ability to meet their business forecasts.** They are increasingly frustrated, they said, by the lack of rail cars to ship their products and rate hikes and accessorial charges they say are accelerating out of control. Captive rail shippers are especially hindered by the lack of transportation service, to the point where some are throttling back production and delaying expansion plans. **When combined with congestion in nearly all segments of the supply chain, it's only a matter of time**, some say, **before consumers feel the effects at the checkout counter.** "Transportation as a whole is under a lot of stress right now, and additional money from Congress to address infrastructure issues is not forthcoming," said Erik Autor, vice president and international trade counsel for the National Retail Federation. "It's affecting anyone involved in transportation, beyond imports and exports, but domestically as well. The system is really starting to crumble, and it's eventually going to find a way into consumer prices." The issue is percolating even within the federal government, which is more accustomed to tracking general trends than keeping tabs on short-term events. Maritime congestion is "masking congestion on the rails and roads," raising costs for shippers and consumers, Jeffrey Shane, undersecretary for policy at the Department of Transportation, told a recent American Association of State Highway and Transportation Officials legislative conference. **As the heavy-lifter for both international and domestic trade, the North American rail system may be under the most stress.** Railroads hit record volume levels last year, up almost 5 percent from 2003, driven largely by waves of imports that show no signs of subsiding in 2005. But even as the railroads have been hustling to keep up with demand on the intermodal side, domestic carload shippers are struggling to keep inventory moving through the supply chain. "It's an aggravation, and **it has hindered us from initiatives designed to improve service and ship more rail**," said Howard Bacon, director of transportation and global supply chain for $26 billion International Paper.

#### That leads to extinction

**Bergsten ‘1** (C. Fred, director of the institute for international economics, foreign affairs, march/april, LN)

The United States' initial refusal in 1997 to contribute to the IMF support package for Thailand for fear of further riling Congress, for example, earned lasting enmity throughout Asia. The main reason for the debacle at Seattle was the United States' inability to propose a new round of trade negotiations that would meet the legitimate interests of other major players. Lacking the domestic authority to lower its own trade barriers, Washington was forced to offer an agenda that sought to reduce protection only in other countries -- a prospect that was understandably unappealing to the rest of the world. Similarly, in 1997 -- 98 APEC negotiations, the United States unsuccessfully pushed a program of sector-specific liberalization that focused almost wholly on U.S. export interests. And six years after the idea of the FTAA was launched in Miami, little progress has been made toward hemispheric trade liberalization. This international leadership vacuum has had two subtle but profound effects on the world economy. Like a bicycle on a hill, the global trading system tends to slip backwards in the absence of continual progress forward. Now, with no serious multilateral trade negotiations taking place anywhere in the world, the backsliding has come in the form of intensified regionalism (which is inherently discriminatory), as well as mercantilist and protectionist disputes across the Atlantic. An East Asian free trade area -- and along with it, a three-bloc world -- will likely emerge if the United States remains on the sidelines of international trade for another five years. Such U.S. impotence would also mean that the traditionally positive impact of regional liberalization on the multilateral process would give way to increasing antagonism and even hostility between the regional blocs. The other chief effect of the leadership vacuum is increased international disregard of, or even hostility toward, the United States on the economic front. Because of its weight in the world economy, its dynamic growth, and its traditional leadership role, **the U**nited **S**tates **remains the most important player in the global economic system**. The other economic powers generally seek to avoid confronting it directly. The EU, for example, has tried to avoid overt battles, despite its escalating range of disputes with the United States. East Asian governments are careful to assure Washington that their new regional initiatives are fully consistent with existing global norms and institutions -- a conciliatory stance that is in sharp contrast to Mahathir's shrill rhetoric of a decade ago and Japanese Vice Minister of Finance Eisuke Sakakibara's aggressive 1997 promotion of the AMF. In reality, however, the United States is perceived as wanting to call the shots without putting up much of its own money or making changes in its own laws and practices. These specific economic complaints fuse with and feed on more general anti-American sentiments throughout the world. Hence, the two other economic superpowers are proceeding on their own. The EU has launched the euro, a new association agreement with Mexico, and negotiations with Mercosur (the trade bloc comprising Argentina, Brazil, Paraguay, and Uruguay); East Asia is pursuing the AMF and the East Asian free trade area. **The result is a clear and steady erosion of both the United** **S**tate**s' position on the global economic scene and the multilateral rules and institutions that it has traditionally championed. If not checked soon, this erosion could deteriorate into severe international conflicts and the disintegration of global economic links.**

#### B. Oil Dependence

#### Shocks Now: Supply Disruptions, Peak Oil, and Speculation

McKillop ‘11

[Andrew\_McKillop](http://www.marketoracle.co.uk/UserInfo-Andrew_McKillop.html%22%20%5Ct%20%22_blank) is a former in-house policy and programming expert, DG XVII Energy, European Commission Oil Crisis In 2012 http://www.marketoracle.co.uk/Article32312.html

In fact, physical supply cuts are in 2012 more possible or rational than at any time for the last 15-20 years, and perhaps even since 1973. Taking only a 15-20 year horizon, but looking the other way, the next 15-20 years will massively change world oil supply, and not for political reasons. Probably by 2017 if there is any recovery of the global economy, world oil supply will certainly "Peak Out". Like physicists trying to find Higgs bosons we can't give an exact number for the final and absolute peak: it might possibly be 95 million barrels a day, or about 6% - 7% above current production. Total's CEO Christophe de Margerie has gone on record saying he thinks even sustaining 90 Mbd is not possible under the best of scenarios - no supply cuts, no major stress in large producer countries, continued high investment in oil E&P at rates similar to the most recent record year of 2007 when $400 billion was spent - and so on. Without recession, world oil demand would have easily hit 90 Mbd in 2012. Getting an idea on how prices might move even with "moderate only" economic recovery and no supply cuts, more than 3 months back (on Sept 15) Goldman Sachs set a price of $130 a barrel as likely in 2012, with the famous spread or premium for Brent against WTI shrunk to almost nothing. The reason is this: Oil supply is short in both hemispheres. Any large outage of supply will destroy the price mechanism and physical rationing will be the only possible end result. Despite Libya coming back fast towards its pre-war output of 1.5 million barrels a day, the Arab world outlook is sombre - the Jasmine revolution and semi peaceful sit-ins were a long way back. Civil war is now the operating mode in the Arab revolt, and this makes worst-case scenarios possible. Revolt in the Middle East presently focusing Syria's civil war, the long simmering Iran nuclear crisis, rising sunni-shia struggle in Iraq now that the US has quit, and the latent threats to Saudi and other Gulf Arab producers are all able to impact oil supply security. Even the rising threats to Putin's total power in his version of "democratic" Russia, with fast rising potentials for long-winded internal power struggles, can affect Russian gas and oil production, supply policies and pricing action.

#### Oil shocks have devastating effects on the U.S. economy and crush allied cohesion and redirects money from major threats to maintenance of supply

Kelley 6

Kelley (member of the Joint Chiefs of Staff under President Ronald Reagan, chairman of the Energy Security Leadership Council), 2006 August 11, The Washington Post, <http://www.washingtonpost.com/wp-dyn/content/article/2006/08/10/AR2006081001316\_pf.html>

Could a mere 4 percent shortfall in daily oil supply propel the price of a barrel to more than $120 in a matter of days? That's what some oil market experts are saying, and if they're correct, we face the very real possibility of an oil shock wave that could send our economy reeling. Such a rapid rise in fuel costs would have profound effects that could severely threaten the foundation of America's economic prosperity The global oil trends now at work -- rising consumption, reduced spare production capacity and high levels of instability in key oil-producing countries -- all increase the likelihood of a supply shock. But unfortunately energy debates in this country often suggest a profound misunderstanding of these international economic dynamics. Calls for "energy independence" notwithstanding, oil is a fungible global commodity, which means that events affecting supply or demand anywhere will affect oil consumers everywhere. A country's exposure to world price shocks is thus a function of the amount of oil it consumes and is not significantly affected by the ratio of domestic to imported petroleum. The magnitude of our dependence on oil puts stress on our military, strengthens our strategic adversaries and undermines our efforts to support democratic allies. Each year the United States expends enormous military resources protecting the chronically vulnerable oil production and distribution network while also preparing to guarantee international access to key oil-producing regions. This allocation of forces and dollars diminishes the military's capability for dealing with the war on terrorism and other defense priorities.

#### Shocks and Dependence collapse NATO Collapse and Leads to Iran Prolif

Scire. 2008.

Oil Dependency, National Security. National Security impacts of oil dependency. Nevada Appeal. http://www.nevadaappeal.com/article/20080210/OPINION/227691244

DoD's dependency on oil as a primary motor fuel makes military operations much more costly than if it had alternative fuels. Oil dependency also requires that we dedicate military forces to the Persian Gulf area, reducing our ability to use those forces in other places. Furthermore, the U.S. military presence in the Middle East raises the potential for military conflicts with other importing nations as world demand increases and supplies decrease. Our oil dependency also strains military alliances, such as NATO, as members compete for oil. Witness the French and Germans working with the Iranians to increase oil production and Pakistan building a port to import Iranian natural gas while we are trying to stop the Iranian nuclear program. Their need for oil and gas trumps our need to stop Iran from obtaining nuclear weapons. The last and perhaps most serious impact on national security of our oil dependency is that the chronic weakening of the U.S. economic base will inevitably weaken our military; we cannot sustain a strong military with a weak economy.

#### NATO solves war but collapse causes extinction

Duffield 94

(Duffield, John S. "NATO's functions after the Cold War." *Political Science Quarterly* 109.n5 (Winter 1994): 763(25). *Expanded Academic ASAP*.)

Initial analyses of NATO's future prospects overlooked at least three important factors that have helped to ensure the alliance's enduring relevance. First, they underestimated the extent to which external threats sufficient to help justify the preservation of the alliance would continue to exist. In fact, NATO still serves to secure its members against a number of actual or potential dangers emanating from outside their territory. These include not only the residual threat posed by Russian military power, but also the relatively new concerns raised by conflicts in neighboring regions. Second, the pessimists failed to consider NATO's capacity for institutional adaptation. Since the end of the cold war, the alliance has begun to develop two important new functions. NATO is increasingly seen as having a significant role to play in containing and controlling militarized conflicts in Central and Eastern Europe. And, at a deeper level, it works to prevent such conflicts from arising at all by actively promoting stability within the former Soviet bloc. Above all, NATO pessimists overlooked the valuable intra-alliance functions that the alliance has always performed and that remain relevant after the cold war. Most importantly, NATO has helped stabilize Western Europe, whose states had often been bitter rivals in the past. By damping the security dilemma and providing an institutional mechanism for the development of common security policies, NATO has contributed to making the use of force in relations among the countries of the region virtually inconceivable. In all these ways, NATO clearly serves the interests of its European members. But even the United States has a significant stake in preserving a peaceful and prosperous Europe. In addition to strong transatlantic historical and cultural ties, American economic interests in Europe - as a leading market for U.S. products, as a source of valuable imports, and as the host for considerable direct foreign investment by American companies - remain substantial. If history is any guide, moreover, the United States could easily be drawn into a future major war in Europe, the consequences of which would likely be even more devastating than those of the past, given the existence of nuclear weapons.(

#### Oil Dependence Leads to Iran War, Escalates to Nuclear Conflict

Glaser ‘11

Reframing Energy Security: How Oil Dependence Influences U.S. National Security Charles L. Glaser cglaser@gwu.edu Professor of Political Science and International Relations Elliot School of International Affairs The George Washington University August 2011, epts.washington.edu/.../Glaser\_-\_EnergySecurity-AUGUST-2011.doc

Energy dependence could draw the United States into a conflict in which a regional power was interrupting, or threatening to interrupt, the flow of oil. The economic costs of a disruption would determine whether the costs of fighting were justified. Similarly, the potential economic costs of a disruption would determine whether U.S. foreign and military policy should be devoted to deterring states from interrupting the flow of oil; more precisely, these economic costs would determine how much the United States should invest in the policies required for deterrence. Given the geographical distribution of oil, such a conflict would likely occur in the Persian Gulf. The greatest danger is probably posed by Iran—the Iraq War has greatly increased Iran’s power relative to Iraq, and Iran is acquiring improved missile capabilities and making progress toward having the capability to build nuclear weapons. The most disruptive Iranian action would be closure of the Strait of Hormuz, through which the vast majority of Persian Gulf oil must pass. Having identified the danger posed by dependence on oil that transits this strait (as well as the Strait of Malacca), a recent Council on Foreign Relations study concluded that the “United States should take the lead in building an infrastructure protection program that would be based on practical steps by relevant countries and address critical infrastructures and transit routes. Initial efforts should focus on joint planning, technical assistance, and military exercises, especially involving naval units operating near ports or along critical sea-lanes.” Although difficult to estimate the probability that Iran would attempt to close the strait, analysts have offered reasons for expecting the probability to be quite low: Iran would lose the oil revenue from its own exports; and Iran would likely be deterred by the probable costs of U.S. intervention, which could include the destruction of key military bases and occupation of some of its territory. Because so much oil flows through the strait, the United States would almost certainly respond to keep it open. Nevertheless, there are plausible scenarios in which Iran blocks the strait, for example, as retaliation for an attack against is nuclear weapons program or as a coercive measure if losing a conventional war. Careful analysis suggests that the United States would prevail, but that a successful campaign could take many weeks or more, and that oil prices would increase significantly during this period. Iranian acquisition of nuclear weapons would increase the risk of this scenario in two basic ways. First, Iran might believe that the possibility of escalation to nuclear weapons would deter the United States from responding, making Iran more willing to interrupt tanker traffic. Although basic deterrence logic says this calculation points in the correct direction, the United States might nevertheless intervene. The United States would question Iran’s willingness to escalate to nuclear use because America’s far larger and more capable nuclear forces would pose a formidable retaliatory threat. In addition, the United States would have incentives to make clear that possession of a small number of nuclear weapons by a much weaker state would not deter the United States from using conventional weapons in a limited war. Being deterred by the Iranian nuclear force would suggest that small nuclear arsenals provide tremendous potential for launching conventional aggression. As Barry Posen argued in a related context (the counterfactual case in which Iraq possessed nuclear weapons before deciding to invade Kuwait), “If the Iraqi conquest of Kuwait is permitted to stand, nuclear weapons will come to be viewed as a shield that protects conventional conquests from *any* challenger, including a great power heavily armed with its own nuclear weapons.” Consequently, the United States would have incentives to respond to Iranian aggression both to preserve its ability to deter conventional aggression by small nuclear states and to support its nonproliferation policy. Second, once a conventional conflict occurred, there would be the danger that U.S. conventional operations could increase the probability nuclear war. A number of paths are possible. The U.S. mine clearing operation required to open the strait would likely be accompanied by attacks against land-based Iranian targets. The United States would want to destroy the land-based anti-ship cruise missiles that Iran could use to threaten U.S. mine clearing ships; in addition, the United States would want to destroy Iranian air defenses that could be used to protect these missiles. These U.S. strikes would require large numbers of carrier-based aircraft flying sorties over a period of a few weeks or more. If Iran lacked confidence that U.S. aims were limited, it could feel compelled to put its nuclear forces on alert to increase their survivability, which would increase the probability of accidental or unauthorized nuclear attack. The United States could then have incentives to attack Iran’s nuclear force, either preemptively because it believed Iran was preparing to launch an attack or preventively because it faced a closing window of opportunity after which Iran’s nuclear forces would be survivable. A more subtle danger is the possibility of inadvertent nuclear escalation resulting from a situation in which Iranian leaders decide to escalate because they believe, incorrectly, that the United States has decided to destroy their nuclear force (or ability to launch it). U.S. conventional operations could create this danger by destroying Iranian radars, and command and control systems, leaving Iranian leaders unable to assess the U.S. conventional campaign and fearing that the United States was preparing to launch a full-scale invasion or a conventional attack against their nuclear forces.

#### **Oil Dependence Makes Terrorism Likely**

Glaser ‘11

Reframing Energy Security: How Oil Dependence Influences U.S. National Security Charles L. Glaser cglaser@gwu.edu Professor of Political Science and International Relations Elliot School of International Affairs The George Washington University August 2011, epts.washington.edu/.../Glaser\_-\_EnergySecurity-AUGUST-2011.doc

The previous mechanisms identified paths via which a state’s efforts to protect, deny and/or acquire oil resources could bring it into conflict with other states. In addition, there is the possibility that the foreign and security policies that a state adopts to protect its oil interests could fuel support for terrorist organizations. Most obviously, this possibility comes to mind because al Qaeda attributes its attacks against the United States and U.S. interests to America’s involvement in the Middle East, probably most importantly its support for the Saudi regime and deployment of troops on Saudi soil. The extent of this danger depends on assessments of the sources of terrorism and the magnitude of the danger posed by terrorist groups, both of which are hotly debated.

#### Terrorism causes extinction

Speice 6

Speice, Patrick F., Jr. "Negligence and nuclear nonproliferation: eliminating the current liability barrier to bilateral U.S.-Russian nonproliferation assistance programs." William and Mary Law Review 47.4 (Feb 2006): 1427(59). Expanded Academic ASAP.

With the end of the Cold War in 1991, the states of the former Soviet Union were thrown into economic and political disarray." Perhaps the greatest risk that accompanied this collapse was the threat of ‘loose nuclear weapons. 29 The end of the Cold War largely eliminated the risk of global nuclear conflict between states, but the threat of terrorist attacks became the primary challenge to the United States' national security, as demonstrated by a number of incidents during the last decade. 30 Although no terrorist acts directed against the population or interests of the United States or other states have been launched with nuclear weapons yet, this failure "must be assumed to be due to lack of means rather than lack of motivation."'" Attempts by al-Qaeda to acquire nuclear material are well documented,32 and several other attempted thefts of nuclear material indicates that there is a demand for nuclear material among terrorist groups, many of which are hostile to the United States. 33 The collapse of the Soviet Union dramatically increased the risk that terrorist organizations will succeed in acquiring fissile material from Russia for several reasons. First, the end of the Soviet state marked the end of state control over every aspect of life in the Soviet Union.34 One by-product of stringent centralized control was heavy regulation and intense security measures for military facilities and nuclear installations. 5 Second, the economic decline that accompanied the transition to a market economy" exacerbated the problem, as the fiscal situation in the former Soviet states, most notably Russia, made security programs impossible to fund.37 Graham Allison summarizes the implications of post-Soviet disorder in Russia: The dramatic changes ... have produced political uncertainty, economic distress, and social dislocation. For tens of millions of Russians, hardship and deprivation are inescapable facts of life.... [H]arsh economic conditions can create incentives for nuclear theft and smuggling. For people who are poorly housed, poorly fed, and poorly paid (when paid at all), there will be a temptation to do what they can to improve their lives and secure their futures. Russia's nuclear custodians face these pressures as they preside over weapons and materials that are immensely valuable to any state or group that covets nuclear weapons. It is not hard to imagine that people leading bleak, uncertain, and difficult lives might find irresistible the prospect of wealth and security via the nuclear black market.... Organizations such as the Russian military and Minatom are now operating in circumstances of great stress. Money is in short supply, paychecks are irregular, living conditions unpleasant.... [D]isorder within Russia and the resulting strains within the military could easily cause a lapse or a breakdown in the Russian military's guardianship of nuclear weapons." Accordingly, there is a significant and ever-present risk that terrorists could acquire a nuclear device or fissile material from Russia as a result of the confluence of Russian economic decline and the end of stringent Soviet-era nuclear security measures."9 Terrorist groups could acquire a nuclear weapon by a number of methods, including "steal[ing] one intact from the stockpile of a country possessing such weapons, or ... [being] sold or given one by such a country, or [buying or stealing] one from another subnational group that had obtained it in one of these ways.'' 4 ' Equally threatening, however, is the risk that terrorists will steal or purchase fissile material and construct a nuclear device on their own. Very little material is necessary to construct a highly destructive nuclear weapon. 41 Although nuclear devices are extraordinarily complex, the technical barriers to constructing a workable weapon are not significant.42 Moreover, the sheer number of methods that could be used to deliver a nuclear device into the United States makes it incredibly likely that terrorists could successfully employ a nuclear weapon once it was built.4 ' Accordingly, supply-side controls that are aimed at preventing terrorists from acquiring nuclear material in the first place are the most effective means of countering the risk of nuclear terrorism. 44 Moreover, the end of the Cold War eliminated the rationale for maintaining a large military-industrial complex in Russia, and the nuclear cities were closed. 45 This resulted in at least 35,000 nuclear scientists becoming unemployed in an economy that was collapsing.4 Although the economy has stabilized somewhat, there are still at least 20,000 former scientists who are unemployed or underpaid and who are too young to retire, 47 raising the chilling prospect that these scientists will be tempted to sell their nuclear knowledge, or steal nuclear material to sell, to states or terrorist organizations with nuclear ambitions.4" The potential consequences of the unchecked spread of nuclear knowledge and material to terrorist groups that seek to cause mass destruction in the United States are truly horrifying. A terrorist attack with a nuclear weapon would be devastating in terms of immediate human and economic losses.49 Moreover, there would be immense political pressure in the United States to discover the perpetrators and retaliate with nuclear weapons, massively increasing the number of casualties and potentially triggering a full-scale nuclear conflict.' In addition to the threat posed by terrorists, leakage of nuclear knowledge and material from Russia will reduce the barriers that states with nuclear ambitions face and may trigger widespread proliferation of nuclear weapons.5' This proliferation will increase the risk of nuclear attacks against the United States or its allies by hostile states,5 2 as well as increase the likelihood that regional conflicts will draw in the United States and escalate to the use of nuclear weapons.53

#### Even if they are no shocks, oil dependence creates entangling alliances that draw the US into major power wars in the Caspian and with Russia

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When a state’s economy depends heavily on oil, severe supply disruptions might do sufficiently large economic damage that the state would use military force to protect its prosperity. A state this suffers this vulnerability risks not only suffering the damage that could be inflicted by a supply disruption, which might be the by-product of unrelated domestic or international events, but also risks being coerced by an adversary. Consequently, states will want to be confident that their ability to import oil will be uninterrupted and will pursue policies to ensure secure access. I am using access broadly, to include at least three different features of secure oil supply: 1) uninterrupted transport, which is probably the most common usage; 2) oil suppliers that are willing to sell oil at market prices; and 3) suppliers whose oil facilities are secure from crippling attack by opposing states and local insurgents. Each type of access identifies different requirements and different potential dangers; all of them suggest scenarios in which the United States could need to use military force to protect the flow of oil. Concern about secure transport can take a variety of forms—a state may need to protect its sea lanes of communication, to defend choke points that make oil traffic relatively easy to disrupt, or to control territory across which oil is piped. For example, China needs to worry about the vulnerability of its SLOCs from the Persian Gulf to northeast Asia; the United States has to be prepared to protect the Strait of Hormuz, most likely from Iranian attack; and numerous states have contested the location of pipelines in the Caspian Sea region because they want to control the territory they cross. Potential security dangers generated by concern about secure transport could also occur via less direct mechanisms. One important possibility is energy-driven alliances. If the United States enters into an alliance that is designed to protect access to oil and protecting that ally then draws the United States into a war, this should be considered an energy-driven conflict, even if the actual war is not fought over oil. As I sketch below, a current example here is America’s interest in the Caspian Region and, more specifically, its desire to include Georgia in NATO, a move that increases the risk of conflict with Russia.

#### Most likely scenario for a major power nuclear war

Blank in 2000

Steven J. Blank is the Douglas MacArthur Professor of Research at the U.S. Army War College and has been an Associate Professor of Russia/Soviet Affairs at the Strategic Studies Institutes. “US Military Engagement with Trancaucasia and Central Asia,” Strategic Studies Institute, June, <http://carlisle-www.army.mil/usassi/welcome.htm>.

Russia’s drive for hegemony over the Transcaucasus and Central Asia therefore led those states and interested foreign powers to an equal and opposing reaction that has blunted the Russian drive. Baku, Erevan, Tashkent, Astana, and Tbilisi, to a greater or lesser degree, are seeking a Western counterbalance to Moscow, which the West, especially Ankara and Washington, are all too happy to provide.68 Central Asia has also turned to China, the United States, and Iran in energy and economics, is exploring forms of regional cooperation, and has begun to build its own national militaries to escape from Russia’s shadow. Apart from expanded trade and commercial relations and support for infrastructural projects beyond the energy and pipeline business, Turkey trains Azerbaijani troops and provides economic-political assistance to Georgia and Azerbaijan. Other Western powers, especially France and Great Britain, also display a rising regional profile. Washington’s burgeoning military-political-economic involvement seeks, inter alia, to demonstrate the U.S. ability to project military power even into this region or for that matter, into Ukraine where NATO recently held exercises that clearly originated as an anti-Russian scenario. Secretary of Defense William Cohen has discussed strengthening U.S.-Azerbaijani military cooperation and even training the Azerbaijani army, certainly alarming Armenia and Russia.69 And Washington is also training Georgia’s new Coast Guard. 70 However, Washington’s well-known ambivalence about committing force to Third World ethnopolitical conflicts suggests that U.S. military power will not be easily committed to saving its economic investment. But this ambivalence about committing forces and the dangerous situation, where Turkey is allied to Azerbaijan and Armenia is bound to Russia, create the potential for wider and more protracted regional conflicts among local forces. In that connection, Azerbaijan and Georgia’s growing efforts to secure NATO’s lasting involvement in the region, coupled with Russia’s determination to exclude other rivals, foster a polarization along very traditional lines.71 In 1993 Moscow even threatened World War III to deter Turkish intervention on behalf of Azerbaijan. Yet the new Russo-Armenian Treaty and Azeri-Turkish treaty suggest that Russia and Turkey could be dragged into a confrontation to rescue their allies from defeat. 72 Thus many of the conditions for conventional war or protracted ethnic conflict in which third parties intervene are present in the Transcaucasus. For example, many Third World conflicts generated by local structural factors have a great potential for unintended escalation. Big powers often feel obliged to rescue their lesser proteges and proxies. One or another big power may fail to grasp the other side’s stakes since interests here are not as clear as in Europe. Hence commitments involving the use of nuclear weapons to prevent a client’s defeat are not as well established or apparent. Clarity about the nature of the threat could prevent the kind of rapid and almost uncontrolled escalation we saw in 1993 when Turkish noises about intervening on behalf of Azerbaijan led Russian leaders to threaten a nuclear war in that case. 73 Precisely because Turkey is a NATO ally, Russian nuclear threats could trigger a potential nuclear blow (not a small possibility given the erratic nature of Russia’s declared nuclear strategies). The real threat of a Russian nuclear strike against Turkey to defend Moscow’s interests and forces in the Transcaucasus makes the danger of major war there higher than almost everywhere else. As Richard Betts has observed, The greatest danger lies in areas where (1) the potential for serious instability is high; (2) both superpowers perceive vital interests; (3) neither recognizes that the other’s perceived interest or commitment is as great as its own; (4) both have the capability to inject conventional forces; and, (5) neither has willing proxies capable of settling the situation.74 Russian perceptions of the Transcaspian’s criticality to its interests is tied to its continuing efforts to perpetuate and extend the vast disproportion in power it possesses relative to other CIS states. This power and resource disproportion between Russia and the smaller states of the Transcaspian region means that no natural equilibrium is possible there. Russia neither can be restrained nor will it accept restraint by any local institution or power in its pursuit of unilateral advantage and reintegration.

#### Global Energy Shortages and Shocks Spark Japan-China Escalation, Draws U.S. Into Major Power War

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The combination of the increased value of territory and alliance commitments could draw the United States into a conflict between Japan and China. In this case, energy’s effect is indirect—energy is not the rationale for the U.S.-Japan alliance, but could contribute to the outbreak of war between China and Japan. China and Japan have an ongoing dispute over their maritime boundary in the East China Sea and, related, over the Senkaku/Diaoyu Islands. The East China Sea contains potentially large oil and gas reserves; estimates of their size vary substantially, with the high end around 100 billion barrels. China and Japan’s divergent views on their maritime boundary, which reflect self-serving interpretations of ambiguities in the UN Convention on the Law of the Sea, significantly influence how much of the East China Sea falls under their control and, more specifically, which petroleum reserves they own. One particular oil and gas field—Chunxiao—has been the focus of much controversy, among other reasons because China is drilling close to the line that Japan claims divides this field and Japan worries that China’s operations could siphon resources from its side of the divide. The maritime boundary dispute is intertwined with the countries’ dispute over the Senkaku/Diaoyu Islands, which are located in the South China Sea. This dispute is important not only because there may be substantial amounts of oil near the islands, but also because Japan’s territorial claim significantly influences the location of the line that it believes divides the South China Sea and increases the size of its exclusive economic zone. Energy has played a central role in fueling controversy in the East China Sea. Neither Japan nor China focused much attention on their claims to the Senkaku/Diaoyu islands until a 1968 UN survey found there could be significant amounts of petroleum near them. The related dispute over the maritime border is long standing, but did not become the focus of intense political disputes and military interactions until Japan reacted to China’s growing oil and gas exploration in areas that Japan maintains are contested. In 2008 China and Japan reached an agreement on joint development of East China Sea petroleum resources, but since then have failed to work out specific issues required for its implementation. Over the past couple of decades, low-level confrontations between China and Japan have resulted over both the island and maritime border disputes, with some increase in their frequency in recent years. Although the stakes do not appear to justify the risk of a large war, experts believe that these disputes are the most likely flash point between Japan and China and warn about the possibility of conflict. A conflict in the South China Sea war could draw in the United States. Although the United States does not take a position on these competing sovereignty claims, the U.S.-Japan security treaty commits it to Japan’s defense if conflict breaks out over these islands, because they are under Japanese administration and are therefore covered by the treaty. The United States reiterated this position in the fall of 2010, as controversy raged following the collision of Chinese and Japanese boats in the vicinity of the Senkaku/Diaoyo Islands.

#### C. Environment

#### Warming is real and human induced

Rahmstorf 8 – Professor of Physics of the Oceans

Richard, of Physics of the Oceans at Potsdam University, Global Warming: Looking Beyond Kyoto, Edited by Ernesto Zedillo, “Anthropogenic Climate Change?,” pg. 42-4

It is time to turn to statement B: human activities are altering the climate. This can be broken into two parts. The first is as follows: global climate is warming. This is by now a generally undisputed point (except by novelist Michael Crichton), so we deal with it only briefly. The two leading compilations of data measured with thermometers are shown in figure 3-3, that of the National Aeronautics and Space Administration (NASA) and that of the British Hadley Centre for Climate Change. Although they differ in the details, due to the inclusion of different data sets and use of different spatial averaging and quality control procedures, they both show a consistent picture, with a global mean warming of 0.8°C since the late nineteenth century. Temperatures over the past ten years clearly were the warmest since measured records have been available. The year 1998 sticks out well above the longterm trend due to the occurrence of a major El Nino event that year (the last El Nino so far and one of the strongest on record). These events are examples of the largest natural climate variations on multiyear time scales and, by releasing heat from the ocean, generally cause positive anomalies in global mean temperature. It is remarkable that the year 2005 rivaled the heat of 1998 even though no El Nino event occurred that year. (A bizarre curiosity, perhaps worth mentioning, is that several prominent "climate skeptics" recently used the extreme year 1998 to claim in the media that global warming had ended. In Lindzen's words, "Indeed, the absence of any record breakers during the past seven years is statistical evidence that temperatures are not increasing.")33 In addition to the surface measurements, the more recent portion of the global warming trend (since 1979) is also documented by satellite data. It is not straightforward to derive a reliable surface temperature trend from satellites, as they measure radiation coming from throughout the atmosphere (not just near the surface), including the stratosphere, which has strongly cooled, and the records are not homogeneous' due to the short life span of individual satellites, the problem of orbital decay, observations at different times of day, and drifts in instrument calibration.' Current analyses of these satellite data show trends that are fully consistent with surface measurements and model simulations." If no reliable temperature measurements existed, could we be sure that the climate is warming? The "canaries in the coal mine" of climate change (as glaciologist Lonnie Thompson puts it) ~are mountain glaciers. We know, both from old photographs and from the position of the terminal moraines heaped up by the flowing ice, that mountain glaciers have been in retreat all over the world during the past century. There are precious few exceptions, and they are associated with a strong increase in precipitation or local cooling.36 I have inspected examples of shrinking glaciers myself in field trips to Switzerland, Norway, and New Zealand. As glaciers respond sensitively to temperature changes, data on the extent of glaciers have been used to reconstruct a history of Northern Hemisphere temperature over the past four centuries (see figure 3-4). Cores drilled in tropical glaciers show signs of recent melting that is unprecedented at least throughout the Holocene-the past 10,000 years. Another powerful sign of warming, visible clearly from satellites, is the shrinking Arctic sea ice cover (figure 3-5), which has declined 20 percent since satellite observations began in 1979. While climate clearly became warmer in the twentieth century, much discussion particularly in the popular media has focused on the question of how "unusual" this warming is in a longer-term context. While this is an interesting question, it has often been mixed incorrectly with the question of causation. Scientifically, how unusual recent warming is-say, compared to the past millennium-in itself contains little information about its cause. Even a highly unusual warming could have a natural cause (for example, an exceptional increase in solar activity). And even a warming within the bounds of past natural variations could have a predominantly anthropogenic cause. I come to the question of causation shortly, after briefly visiting the evidence for past natural climate variations. Records from the time before systematic temperature measurements were collected are based on "proxy data," coming from tree rings, ice cores, corals, and other sources. These proxy data are generally linked to local temperatures in some way, but they may be influenced by other parameters as well (for example, precipitation), they may have a seasonal bias (for example, the growth season for tree rings), and high-quality long records are difficult to obtain and therefore few in number and geographic coverage. Therefore, there is still substantial uncertainty in the evolution of past global or hemispheric temperatures. (Comparing only local or regional temperature; as in Europe, is of limited value for our purposes,' as regional variations can be much larger than global ones and can have many regional causes, unrelated to global-scale forcing and climate change.) The first quantitative reconstruction for the Northern Hemisphere temperature of the past millennium, including an error estimation, was presented by Mann, Bradley, and Hughes and rightly highlighted in the 2001 IPCC report as one of the major new findings since its 1995 report; it is shown in figure 3\_6.39 The analysis suggests that, despite the large error bars, twentieth-century warming is indeed highly unusual and probably was unprecedented during the past millennium. This result, presumably because of its symbolic power, has attracted much criticism, to some extent in scientific journals, but even more so in the popular media. The hockey stick-shaped curve became a symbol for the IPCC, .and criticizing this particular data analysis became an avenue for some to question the credibility of the IPCC. Three important things have been overlooked in much of the media coverage. First, even if the scientific critics had been right, this would not have called into question the very cautious conclusion drawn by the IPCC from the reconstruction by Mann, Bradley, and Hughes: "New analyses of proxy data for the Northern Hemisphere indicate that the increase in temperature in the twentieth century is likely to have been the largest of any century during the past 1,000 years." This conclusion has since been supported further by every single one of close to a dozen new reconstructions (two of which are shown in figure 3-6).Second, by far the most serious scientific criticism raised against Mann, Hughes, and Bradley was simply based on a mistake. 40 The prominent paper of von Storch and others, which claimed (based on a model test) that the method of Mann, Bradley, and Hughes systematically underestimated variability, "was [itself] based on incorrect implementation of the reconstruction procedure."41 With correct implementation, climate field reconstruction procedures such as the one used by Mann, Bradley, and Hughes have been shown to perform well in similar model tests. Third, whether their reconstruction is accurate or not has no bearing on policy. If their analysis underestimated past natural climate variability, this would certainly not argue for a smaller climate sensitivity and thus a lesser concern about the consequences of our emissions. Some have argued that, in contrast, it would point to a larger climate sensitivity. While this is a valid point in principle, it does not apply in practice to the climate sensitivity estimates discussed herein or to the range given by IPCC, since these did not use the reconstruction of Mann, Hughes, and Bradley or any other proxy records of the past millennium. Media claims that "a pillar of the Kyoto Protocol" had been called into question were therefore misinformed. As an aside, the protocol was agreed in 1997, before the reconstruction in question even existed. The overheated public debate on this topic has, at least, helped to attract more researchers and funding to this area of paleoclimatology; its methodology has advanced significantly, and a number of new reconstructions have been presented in recent years. While the science has moved forward, the first seminal reconstruction by Mann, Hughes, and Bradley has held up remarkably well, with its main features reproduced by more recent work. Further progress probably will require substantial amounts of new proxy data, rather than further refinement of the statistical techniques pioneered by Mann, Hughes, and Bradley. Developing these data sets will require time and substantial effort. It is time to address the final statement: most of the observed warming over the past fifty years is anthropogenic. A large number of studies exist that have taken different approaches to analyze this issue, which is generally called the "attribution problem." I do not discuss the exact share of the anthropogenic contribution (although this is an interesting question). By "most" I imply mean "more than 50 percent.”The first and crucial piece of evidence is, of course, that the magnitude of the warming is what is expected from the anthropogenic perturbation of the radiation balance, so anthropogenic forcing is able to explain all of the temperature rise. As discussed here, the rise in greenhouse gases alone corresponds to 2.6 W/tn2 of forcing. This by itself, after subtraction of the observed 0'.6 W/m2 of ocean heat uptake, would Cause 1.6°C of warming since preindustrial times for medium climate sensitivity (3"C). With a current "best guess'; aerosol forcing of 1 W/m2, the expected warming is O.8°c. The point here is not that it is possible to obtain the 'exact observed number-this is fortuitous because the amount of aerosol' forcing is still very' uncertain-but that the expected magnitude is roughly right. There can be little doubt that the anthropogenic forcing is large enough to explain most of the warming. Depending on aerosol forcing and climate sensitivity, it could explain a large fraction of the warming, or all of it, or even more warming than has been observed (leaving room for natural processes to counteract some of the warming). The second important piece of evidence is clear: there is no viable alternative explanation. In the scientific literature, no serious alternative hypothesis has been proposed to explain the observed global warming. Other possible causes, such as solar activity, volcanic activity, cosmic rays, or orbital cycles, are well observed, but they do not show trends capable of explaining the observed warming. Since 1978, solar irradiance has been measured directly from satellites and shows the well-known eleven-year solar cycle, but no trend. There are various estimates of solar variability before this time, based on sunspot numbers, solar cycle length, the geomagnetic AA index, neutron monitor data, and, carbon-14 data. These indicate that solar activity probably increased somewhat up to 1940. While there is disagreement about the variation in previous centuries, different authors agree that solar activity did not significantly increase during the last sixty-five years. Therefore, this cannot explain the warming, and neither can any of the other factors mentioned. Models driven by natural factors only, leaving the anthropogenic forcing aside, show a cooling in the second half of the twentieth century (for an example, See figure 2-2, panel a, in chapter 2 of this volume). The trend in the sum of natural forcings is downward.The only way out would be either some as yet undiscovered unknown forcing or a warming trend that arises by chance from an unforced internal variability in the climate system. The latter cannot be completely ruled out, but has to be considered highly unlikely. No evidence in the observed record, proxy data, or current models suggest that such internal variability could cause a sustained trend of global warming of the observed magnitude. As discussed, twentieth century warming is unprecedented over the past 1,000 years (or even 2,000 years, as the few longer reconstructions available now suggest), which does not 'support the idea of large internal fluctuations. Also, those past variations correlate well with past forcing (solar variability, volcanic activity) and thus appear to be largely forced rather than due to unforced internal variability." And indeed, it would be difficult for a large and sustained unforced variability to satisfy the fundamental physical law of energy conservation. Natural internal variability generally shifts heat around different parts of the climate system-for example, the large El Nino event of 1998, which warmed, the atmosphere by releasing heat stored in the ocean. This mechanism implies that the ocean heat content drops as the atmosphere warms. For past decades, as discussed, we observed the atmosphere warming and the ocean heat content increasing, which rules out heat release from the ocean as a cause of surface warming. The heat content of the whole climate system is increasing, and there is no plausible source of this heat other than the heat trapped by greenhouse gases. ' A completely different approach to attribution is to analyze the spatial patterns of climate change. This is done in so-called fingerprint studies, which associate particular patterns or "fingerprints" with different forcings. It is plausible that the pattern of a solar-forced climate change differs from the pattern of a change caused by greenhouse gases. For example, a characteristic of greenhouse gases is that heat is trapped closer to the Earth's surface and that, unlike solar variability, greenhouse gases tend to warm more in winter, and at night. Such studies have used different data sets and have been performed by different groups of researchers with different statistical methods. They consistently conclude that the observed spatial pattern of warming can only be explained by greenhouse gases.49 Overall, it has to be considered, highly likely' that the observed warming is indeed predominantly due to the human-caused increase in greenhouse gases. ' This paper discussed the evidence for the anthropogenic increase in atmospheric CO2 concentration and the effect of CO2 on climate, finding that this anthropogenic increase is proven beyond reasonable doubt and that a mass of evidence points to a CO2 effect on climate of 3C ± 1.59C global-warming for a doubling of concentration. (This is, the classic IPCC range; my personal assessment is that, in-the light of new studies since the IPCC Third Assessment Report, the uncertainty range can now be narrowed somewhat to 3°C ± 1.0C) This is based on consistent results from theory, models, and data analysis, and, even in the absence-of any computer models, the same result would still hold based on physics and on data from climate history alone. Considering the plethora of consistent evidence, the chance that these conclusions are wrong has to be considered minute. If the preceding is accepted, then it follows logically and incontrovertibly that a further increase in CO2 concentration will lead to further warming. The magnitude of our emissions depends on human behavior, but the climatic response to various emissions scenarios can be computed from the information presented here. The result is the famous range of future global temperature scenarios shown in figure 3\_6.50 Two additional steps are involved in these computations: the consideration of anthropogenic forcings other than CO2 (for example, other greenhouse gases and aerosols) and the computation of concentrations from the emissions. Other gases are not discussed here, although they are important to get quantitatively accurate results. CO2 is the largest and most important forcing. Concerning concentrations, the scenarios shown basically assume that ocean and biosphere take up a similar share of our emitted CO2 as in the past. This could turn out to be an optimistic assumption; some models indicate the possibility of a positive feedback, with the biosphere turning into a carbon source rather than a sink under growing climatic stress. It is clear that even in the more optimistic of the shown (non-mitigation) scenarios, global temperature would rise by 2-3°C above its preindustrial level by the end of this century. Even for a paleoclimatologist like myself, this is an extraordinarily high temperature, which is very likely unprecedented in at least the past 100,000 years. As far as the data show, we would have to go back about 3 million years, to the Pliocene, for comparable temperatures. The rate of this warming (which is important for the ability of ecosystems to cope) is also highly unusual and unprecedented probably for an even longer time. The last major global warming trend occurred when the last great Ice Age ended between 15,000 and 10,000 years ago: this was a warming of about 5°C over 5,000 years, that is, a rate of only 0.1 °C per century. 52 The expected magnitude and rate of planetary warming is highly likely to come with major risk and impacts in terms of sea level rise (Pliocene sea level was 25-35 meters higher than now due to smaller Greenland and Antarctic ice sheets), extreme events (for example, hurricane activity is expected to increase in a warmer climate), and ecosystem loss. The second part of this paper examined the evidence for the current warming of the planet and discussed what is known about its causes. This part showed that global warming is already a measured and-well-established fact, not a theory. Many different lines of evidence consistently show that most of the observed warming of the past fifty years was caused by human activity. Above all, this warming is exactly what would be expected given the anthropogenic rise in greenhouse gases, and no viable alternative explanation for this warming has been proposed in the scientific literature. Taken together., the very strong evidence accumulated from thousands of independent studies, has over the past decades convinced virtually every climatologist around the world (many of whom were initially quite skeptical, including myself) that anthropogenic global warming is a reality with which we need to deal.

#### Now is the key time-slowing warming is key to avoid positive feedbacks

James E. **Hanson**, Head, NASA Goddard Institute, Testimony before House Select Committee on Energy Independnece and Global Warming, 6—23—**08**, www.columbia.edu/~jeh1/2008/TwentyYearsLater\_20080623.pdf

Fast feedbacks—changes that occur quickly in response to temperature change—amplify the initial temperature change, begetting additional warming. As the planet warms, fast feedbacks include more water vapor, which traps additional heat, and less snow and sea ice, which exposes dark surfaces that absorb more sunlight. Slower feedbacks also exist. Due to warming, forests and shrubs are moving poleward into tundra regions. Expanding vegetation, darker than tundra, absorbs sunlight and warms the environment. Another slow feedback is increasing wetness (i.e., darkness) of the Greenland and West Antarctica ice sheets in the warm season. Finally, as tundra melts, methane, a powerful greenhouse gas, is bubbling out. Paleoclimatic records confirm that the long-lived greenhouse gases— methane, carbon dioxide, and nitrous oxide—all increase with the warming of oceans and land. These positive feedbacks amplify climate change over decades, centuries, and longer. The predominance of positive feedbacks explains why Earth’s climate has historically undergone large swings: feedbacks work in both directions, amplifying cooling, as well as warming, forcings. In the past, feedbacks have caused Earth to be whipsawed between colder and warmer climates, even in response to weak forcings, such as slight changes in the tilt of Earth’s axis.2 The second fundamental property of Earth’s climate system, partnering with feedbacks, is the great inertia of oceans and ice sheets. Given the oceans’ capacity to absorb heat, when a climate forcing (such as increased greenhouse gases) impacts global temperature, even after two or three decades, only about half of the eventual surface warming has occurred. Ice sheets also change slowly, although accumulating evidence shows that they can disintegrate within centuries or perhaps even decades. The upshot of the combination of inertia and feedbacks is that additional climate change is already “in the pipeline”: even if we stop increasing greenhouse gases today, more warming will occur. This is sobering when one considers the present status of Earth’s climate. Human civilization developed during the Holocene (the past 12,000 years). It has been warm enough to keep ice sheets off North America and Europe, but cool enough for ice sheets to remain on Greenland and Antarctica. With rapid warming of 0.6°C in the past 30 years, global temperature is at its warmest level in the Holocene.3 The warming that has already occurred, the positive feedbacks that have been set in motion, and the additional warming in the pipeline together have brought us to the precipice of a planetary tipping point. We are at the tipping point because the climate state includes large, ready positive feedbacks provided by the Arctic sea ice, the West Antarctic ice sheet, and much of Greenland’s ice. Little additional forcing is needed to trigger these feedbacks and magnify global warming. If we go over the edge, we will transition to an environment far outside the range that has been experienced by humanity, and there will be no return within any foreseeable future generation. Casualties would include more than the loss of indigenous ways of life in the Arctic and swamping of coastal cities. An intensified hydrologic cycle will produce both greater floods and greater droughts. In the US, the semiarid states from central Texas through Oklahoma and both Dakotas would become more drought-prone and ill suited for agriculture, people, and current wildlife. Africa would see a great expansion of dry areas, particularly southern Africa. Large populations in Asia and South America would lose their primary dry season freshwater source as glaciers disappear. A major casualty in all this will be wildlife.

#### These positive feedback loops ensure that climate change will be abrupt and rapid—like flipping a switch—and makes ice and wars inevitable

John **Carey**, journalist, “Global Warming,” BUSINESS WEEK, 8—30—**04**, p. 48.

More worrisome, scientists have learned from the past that seemingly small perturbations can cause the climate to swing rapidly and dramatically. Data from ice cores taken from Greenland and elsewhere reveal that parts of the planet cooled by 10 degrees Celsius in just a few decades about 12,700 years ago. Five thousand years ago, the Sahara region of Africa was transformed from a verdant lake-studded landscape like Minnesota's to barren desert in just a few hundred years. The initial push -- a change in the earth's orbit -- was small and very gradual, says geochemist Peter B. deMenocal of Columbia University's Lamont-Doherty Earth Observatory. ``But the climate response was very abrupt -- like flipping a switch.'' The earth's history is full of such abrupt climate changes. Now many scientists fear that the current buildup of greenhouse gases could also flip a global switch. ``To take a chance and say these abrupt changes won't occur in the future is sheer madness,'' says Wallace S. Broecker, earth scientist at Lamont-Doherty. ``That's why it is absolutely foolhardy to let CO2 go up to 600 or 800 ppm.'' Indeed, Broecker has helped pinpoint one switch involving ocean currents that circulate heat and cold (table, page 68). If this so-called conveyor shuts down, the Gulf Stream stops bringing heat to Europe and the U.S. Northeast. This is not speculation. It has happened in the past, most recently 8,200 years ago. Can it happen again? Maybe. A recent Pentagon report tells of a ``plausible...though not the most likely'' scenario, in which the conveyor shuts off. ``Such abrupt climate change...could potentially destabilize the geopolitical environment, leading to skirmishes, battles, and even war,'' it warns.

#### Climate change is more likely to cause extinction than nuclear war

**NEW YORK END** TIMES ‘06, http://newyorkendtimes.com/extinctionscale.asp

We rate Global Climate Change as a greater threat for human extinction in this century. Most scientists forecast disruptions and dislocations, if current trends persist. The extinction danger is more likely if we alter an environmental process that causes harmful effects and leads to conditions that make the planet uninhabitable to humans. Considering that there is so much that is unknown about global systems, we consider climate change to be the greatest danger to human extinction. However, there is no evidence of imminent danger. Nuclear war at some point in this century might happen. It is unlikely to cause human extinction though. While several countries have nuclear weapons, there are few with the firepower to annihilate the world. For those nations it would be suicidal to exercise that option. The pattern is that the more destructive technology a nation has, the more it tends towards rational behavior. Sophisticated precision weapons then become better tactical options. The bigger danger comes from nuclear weapons in the hands of terrorists with the help of a rogue state, such as North Korea. The size of such an explosion would not be sufficient to threaten humanity as a whole. Instead it could trigger a major war or even world war. Under this scenario human extinction would only be possible if other threats were present, such as disease and climate change. We monitor war separately. However we also need to incorporate the dangers here .

#### Warming also collapses oxygen levels and leads to extinction

Brandenburg & Paxson ’00, (Both PhDs, Dead Mars, Dying Earth, pg. 246-247)

A terrible synergism of disaster is already at work. The complex system called climate is running amok because of increasing carbon dioxide, while at the same time, oxygen, the “other gas” involved in the combustion of fossil fuels, is losing concentration levels in our atmosphere. We are talking oxygen, the gas that we breathe in to fire out every cell in our bodies – not carbon dioxide that we breathe out as waste, but the stuff we need to sustain the process called life. The decline of oxygen is tiny, but easily measurable. Its decline may have been noted years ago, but its significance was immediately minimized. In a bow to its emotional implications, the data was suppressed – or, given the human ability to distance or deny – maybe even repressed. The decline in oxygen concentration means the beginning of the end for fossil fuels. To continue to burn them at the present rate, to contemplate that we will industrialize the Third World based on fossil fuel use, to consider that the world’s rainforests are just idle land to be burned and farmed, is to participate in an act of environmental genocide and self-immolation. Some will insist that even though the world’s supply of oxygen is going down, the amount is too small to be important. That is nonsense. It is important. On the course we are on, it will continue to fall. Finally, it will plummet like a stone. The decline in oxygen is important because it shows where we are going. It is akin to the canary falling off its perch in the coal mine, or the frantic call from the crow’s nest that an iceberg is dead ahead.

#### Air pollution kills millions and collapses the economy and the health care system- public transit is key to solve

Fischlowitz-Roberts ‘2 (Bernie, "Air Pollution Fatalities Now Exceed Traffic Fatalities by 3 to 1," Earth Policy Institute, 9/17, http://www.earth-policy.org/Updates/Update17.htm)

The World Health Organization reports that 3 million people now die each year from the effects of air pollution. This is three times the 1 million who die each year in automobile accidents. A study published in *The Lancet* in 2000 concluded that air pollution in France, Austria, and Switzerland is responsible for more than 40,000 deaths annually in those three countries. About half of these deaths can be traced to air pollution from vehicle emissions. In the United States, traffic fatalities total just over 40,000 per year, while air pollution claims 70,000 lives annually. U.S. air pollution deaths are equal to deaths from breast cancer and prostate cancer combined. This scourge of cities in industrial and developing countries alike threatens the health of billions of people. Governments go to great lengths to reduce traffic accidents by fining those who drive at dangerous speeds, arresting those who drive under the influence of alcohol, and even sometimes revoking drivers' licenses. But they pay much less attention to the deaths people cause by simply driving the cars. While deaths from heart disease and respiratory illness from breathing polluted air may lack the drama of deaths from an automobile crash, with flashing lights and sirens, they are no less real. Air pollutants include carbon monoxide, ozone, sulfur dioxide, nitrogen oxides, and particulates. These pollutants come primarily from the combustion of fossil fuels, principally coal-fired power plants and gasoline-powered automobiles. Nitrogen oxides can lead to the formation of ground-level ozone. Particulates are emitted from a variety of sources, primarily diesel engines. "Smog"-a hybrid word used to describe the mixture of smoke and fog that blankets some cities-is primarily composed of ozone and particulates. The air in most urban areas typically contains a mixture of pollutants, each of which may increase a person's vulnerability to the effects of the others. Exposure to carbon monoxide slows reflexes and causes drowsiness, since carbon monoxide molecules bind to hemoglobin, reducing the amount of oxygen that red blood cells can carry. Nitrogen dioxide can aggravate asthma and reduce lung function, as well as making airways more sensitive to allergens. Ozone also causes lung inflammation and reduces lung function and exercise capacity. Smaller particulates, especially those 10 micrometers in diameter (1/2,400 of an inch) or smaller, can become lodged in the alveolar sacs of the lungs. They are associated with higher admissions to hospital for respiratory problems and with increased mortality, particularly from respiratory and cardiovascular diseases. As particulate concentrations in the air rise, so do death rates. When people inhale particulates and ozone at concentrations commonly found in urban areas, their arteries become more constricted, thus reducing blood flow and oxygen supply to the heart. This is why air pollution aggravates heart conditions and asthma. Unlike some pollutants that have threshold levels below which no health effects are seen, ozone and particulates have negative health effects even at very low levels. Thus no "safe" level of such pollutants exists. Research published in Science in 2001 noted that in industrial as well as developing countries, exposures to current levels of ozone and particulates "affect death rates, hospitalizations and medical visits, complications of asthma and bronchitis, days of work lost, restricted-activity days, and a variety of measures of lung damage." While these affect health care systems, they also take a toll on the economy. The increased monetary expenses related to air pollution induced illness include the costs of medication, absences from work, and child care expenses. In the Canadian province of Ontario, for example, which has a population of 11.9 million, air pollution costs citizens at least $1 billion annually in hospital admissions, emergency room visits, and worker absenteeism. According to the World Bank, the social costs of exposure to airborne dust and lead in Jakarta, Bangkok, and Manila approached 10 percent of average incomes in the early 1990s. In China, which has some of the world's worst urban air pollution, the illnesses and deaths of urban residents due to air pollution are estimated to cost 5 percent of the gross domestic product. The economic costs of air pollution argue for reducing income taxes and raising taxes on fossil fuels. This would encourage more efficient fuel use, a shift to clean energy sources, and the adoption of pollution controls. The alternative is to spend more on health insurance to treat air pollution-related ailments. Raising the costs of polluting fuels will reduce suffering and premature death. In response to traffic congestion and their notorious air pollution problems, Mexico City and São Paulo restrict people from driving on certain days of the week, based on the last digit on their license plates. And Bogotá, Colombia, has put in place a series of measures to reduce air pollution from transportation; in the process, it has become a more livable city. Since 1995, the city has reduced traffic during rush hours by 40 percent and increased the gasoline tax. Some 120 kilometers (75 miles) of main arteries are closed for seven hours each Sunday, which allows the streets to be used for walking, bicycling, and jogging. The solutions to urban air pollution are not difficult to discern. Individuals can reduce car usage in favor of cycling, walking, and mass transit and can use more fuel-efficient cars. Urban planning commissions and regional governments can redirect transportation funding toward mass transit options: light rail, heavy rail, or rapid bus transit. Zoning laws and other regulatory tools can be used to encourage the higher density development that is conducive to mass transit. And countries can shift electricity generation from coal and natural gas toward wind and solar power, using the lever of government subsidies and tax incentives for clean energy, rather than continuing to subsidize fossil fuels. When purchasing a new car, consumers typically consider price, extra features, safety, and sometimes fuel economy. The fact that air pollution fatalities substantially exceed traffic fatalities worldwide suggests the need to broadly redefine notions of safety to include the goal of decreasing air pollution. While only some motorists contribute to traffic fatalities, all motorists contribute to air pollution fatalities.

#### Pollution threats human survival

**Zayed Prize 3** (PG. http://www.zayedprize.org.ae/en/display.aspx?type=news&id=1518)

Air pollution is a serious threat to human survival affecting all aspects of life on earth including its socio-economic development. Climatic changes have been on their upswing choking, many urban areas worldwide and theory effecting sustainable development. With Asian brown clouds becoming an important issue in this part of the world. It has been catching media headlines recently.

#### Warming leads to Indo-Pak war- water shortages and high food prices

**Lynas ‘7**, (Mark, Environmental Activist, Educational focus on Politics and History, Six Degrees, pg. 162)

**With India** particularly **dependent on hydroelectric power** generation, **dwindling** summer **flows may lead to blackouts and energy shortages** during the hottest months of the year. **Two of the Indus River’s major tributaries** – the Chenab and Sutlej – **arise in India and flow into Pakistan.** Both will also be suffering the effects of deglaciation in their upper reaches. **Conflict may** well **break out between these two nuclear-armed countries as water supplies dwindle and political leaders quarrel** over how much can be stured behind dams in upstreat reservoirs. **Any crisis in food production could quickly escalate into a crisis for the whole Pakistani economy. The country depends heavily on cash-crop exports** of rice and sugar, both of which are grown extensively in irrigated Punjab. Farther south, where the province of Sindh relies solely on the Indus for inflows into its canal system, farmers may find themselves outmatched by their more powerful Punjabi colleagues to the north. Farmers across the country may find themselves outmatched in turn by big cities like Lahore, Hyderabad, and Karachi, which each support populatioins in the millions. As dry-season supplies from the Indus dwindle with the retreating ice upstream, a cascade of impacts may begin to pile up the pressure on Pakistani society, as people leave the land in huge numbers and flee to the overcrowded cities. **With global food stocks already under pressure**, as discussed earlier, **little or no surplus capacity will remain to feed people displaced from** **formerly irrigated areas**. **Further conflicts could arise with India if millions of Pakistani refugees cross the border** in order to find sustenance in better watered areas served by the Ganges but already supporting dense populations.

#### Indo-Pak war escalates to major nuclear war

**Washington Times ‘1** (July 8, LN)

**The most dangerous place on the planet is Kashmir**, a disputed territory convulsed and illegally occupied for more than 53 years and sandwiched between nuclear-capable India and Pakistan. **It has ignited two wars** between the estranged South Asian rivals in 1948 and 1965, and **a third could trigger nuclear volleys and a nuclear winter threatening the entire globe.** **The U**nited **S**tates **would enjoy no sanctuary**. This apocalyptic vision is no idiosyncratic view. The director of central intelligence, the Defense Department, and world experts generally place Kashmir at the peak of their nuclear worries. Both India and Pakistan are racing like thoroughbreds to bolster their nuclear arsenals and advanced delivery vehicles. Their defense budgets are climbing despite widespread misery amongst their populations. Neither country has initialed the Nuclear Non-Proliferation Treaty, the Comprehensive Test Ban Treaty, or indicated an inclination to ratify an impending Fissile Material/Cut-off Convention.

### Observation 3. Plan Solves The Doom

#### Electrification Infrastructure Ramp up Solves Congestion and Peak Oil

Drake 8, Alan, consulting engineer, “Multiple Birds-One Silver BB: A synergistic set of solutions focused on Electrified Railroads, 7/15/08, http://www.theoildrum.com/node/4301 Accessed: 6/26/12

How much truck freight can be shifted to rail? The correct answer from several public policy perspectives is “as much as possible, as soon as possible”. There are several variables in this calculation: Cost - Rail is already cheaper than trucking, but trucks have a larger modal share except for the lowest value cargoes (coal, gravel, grain). The cost differential is growing rapidly, and there is a shift from truck to rail, but not fast enough for public policy goals. Electrified rail will be even cheaper than diesel rail. Speed & Reliability – It is critical to close the speed and reliability advantage that trucks have over rail. Electrification, double tracking, track improvements and better signals will all speed up trains and reduce the uncertainty about transit times and delivery dates. Management Philosophy - Railroads currently want to run their tracks very close to capacity and they avoid “overbuilding” at all costs. A change in business philosophy will be required to capture higher value cargoes - cargoes from shippers willing to pay a premium rate several times coal rates. For example, Union Pacific stopped carrying UPS shipments because they did not want the operational hassle of running trains on time. US railroads will need to “overbuild” and change operating procedures to get the required capacity, speed and reliability needed to attract a majority of truck freight. Federal policy can help change this with incentives. Semi-High Speed Express Freight - Offering express freight service (with refrigeration as needed) at 90 to 100 mph will capture large segments of the truck market and part of the air freight market. Express freight service is the essential economic driver for a 14,000-mile Semi-High Speed Rail network (more published at a later date on this). Regional passenger service at 110 mph will likely be a large but secondary benefit. Time – Time will be required for shippers to adjust to rail. For example, WalMart has gone almost exclusively to trucking and their many regional distribution centers were built with only trucks in mind. WalMart, and other like shippers, will have to build new regional distribution centers that can accept container trains from ports and domestic factories, and the railroads will need to improve service enough to attract behemoths such as WalMart. Under the pressure of ever-higher oil prices, such changes will still likely take a decade to complete (and the abandoning some not fully depreciated real estate). In some cases, rail will come to the factories and distributors with new spur lines. In other cases, the factories and distributors will move to rail spurs. And in many cases, “the last mile” will be by truck from a local or regional rail-truck inter-modal facility. The key to such a large scale migration is improved rail service more than a cost differential. During WW II, public/military policy was to ship everything by rail and as little as possible by truck in order to save fuel and trucks for overseas operations. Lieut. E. L. Tennyson, Office of Chief of Transportation, US Army states that 90% of ton-miles in the 48 states were by rail during WW II. Ed Tennyson has made the rough estimation that a $250 billion investment in rail infrastructure (electrification, double tracking, no semi-High Speed Rail) would result in an eventual transfer of 67% of truck ton-miles to rail in a high oil price environment. I believe that, in an environment of very high oil prices, an investment of $400 to $450 billion (including semi-High Speed Rail and some new rail lines) could result in an 85% shift of existing truck freight ton-miles to rail. It is difficult to calculate the long term road maintenance savings from such a shift, but that savings alone may justify such massive investments. The bulk of rail investments have 50-year useful lives. A nation-wide improved and electrified rail system would be a very worthwhile inheritance for the next generation facing a post-Peak Oil future.

#### Only Federal Action Solves—Massive Resources of the Government Are Required to Overcome State and Private Infrastructure Intransigence. Any Private Actor or State CP is Object Fiat

Longman ‘9

Phillip Longman is a senior fellow at the New America Foundation. Back on Tracks

A nineteenth-century technology could be the solution to our twenty-first-century problems. <http://www.washingtonmonthly.com/features/2009/0901.longman.html#Byline>, Jan/Feb

Why don’t the railroads just build the new tracks, tunnels, switchyards, and other infrastructure they need? America’s major railroad companies are publicly traded companies answerable to often mindless, or predatory, financial Goliaths. While Wall Street was 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. 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. But public goods 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 Buffett—who is bullish on railroads—and a few other smart, patient investors. The alternative is for the public to help pay for rail infrastructure. Actually, it’s not much of a choice. Unlike private investors, the government must either invest in shoring up the railroads’ overwhelmed infrastructure or pay in other ways. Failing to rebuild rail infrastructure will simply further move the burden of ever-increasing shipping demands onto the highways, the expansion and maintenance of which does not come free. 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 costs), and adding $10 billion to highway costs over the next twenty years. "Inclusion of costs for bridges, interchanges, etc., could double this estimate," their

#### **PPPs Spark Investor Confidence to Solve Because They Alleviate Risk and Create Efficient Solutions**

AAR ‘3

Association of American Rairoads. RAILROADS URGE MORE PUBLIC/PRIVATE PARTNERSHIPS, <http://www.aar.org/NewsAndEvents/Press-Releases/2003/06/Railroads%20Urge%20More%20PublicPrivate%20Partnerships.aspx>, June 26.

The nation’s railroads today urged Congress to support “public-private financing partnerships for railroad infrastructure improvement projects” in order to realize the public benefits that would come if more freight is moved by rail. In testimony before the House Transportation and Infrastructure Committee’s Railroad Subcommittee, Edward R. Hamberger, president and chief executive officer of the Association of American Railroads (AAR), said that greater use of rail can yield significant “public benefits, such as reduced congestion, cleaner air, improved safety and enhanced mobility.” But, he pointed out, financial markets will only fund those investments that “provide a reasonable promise of a direct economic benefit to the investing railroads.” The best method of achieving those public benefits, Hamberger said, is through “public-private partnerships (which) provide a means for transportation planners and providers to effectively meet vital transportation needs by combining the efficiency of the private sector with the equity of public participation.” He cited a recently-announced public-private partnership in Chicago as “a model for cost-effective public-private partnerships. Railroads will pay for the benefits they receive from the project, while the government will pay for the public benefits that accrue from it.” The total cost of the project is estimated at $1.5 billion. Based on their expected benefits, freight railroads will put $212 million into the project, with the balance coming from public funds. “The project is expected to produce a stream of hundreds of millions of dollars in public benefits just to the Chicago region,” Hamberger said. “In addition, because of Chicago’s critical importance as a national transportation hub, benefits of the project will ‘ripple’ nationwide to every state,” Hamberger said.

#### Freight Rail Infrastructure Investment Key—Industry Will Accept Solves Emissions, Dependency, and Economy

Longman ‘9

Phillip Longman is a senior fellow at the New America Foundation. Back on Tracks

A nineteenth-century technology could be the solution to our twenty-first-century problems. <http://www.washingtonmonthly.com/features/2009/0901.longman.html#Byline>, Jan/Feb

The railroad has long been reluctant to accept government investment in its infrastructure out of fear of public meddling, such as being compelled to run money-losing passenger trains. But now, like most of the industry, it has changed its mind, and it happily accepted Virginia’s offer last year to fund a small portion—$40 million—of the investment needed to get more freight traffic off I-81 and onto the Crescent Corridor. The railroad estimates that with an additional $2 billion in infrastructure investment, it could divert a million trucks off the road, which is currently carrying just under five million. State officials are thinking even bigger: a study sponsored by the Virginia DOT finds that a cumulative investment over ten to twelve years of less than $8 billion would divert 30 percent of the growing truck traffic on I-81 to rail. 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 reduction. Today, a single train can move as many containers as 280 trucks while using one-third as much energy—and that’s before any improvements to rail infrastructure. For now, Virginia lacks the resources to build its "steel wheel interstate," but that could change quickly. Thanks to the collapsing economy, a powerful new consensus has developed in Washington behind a once-in-a-generation investment in infrastructure. The incoming administration is talking of spending as much as $1 trillion to jump-start growth and make up for past neglect, an outlay that Obama himself characterizes as "the single largest new investment in our national infrastructure since the creation of the federal highway system in the 1950s." We’ll soon be moving earth again like it’s 1959. By all rights, America’s dilapidated rail lines ought to be a prime candidate for some of that spending. All over the country there are opportunities like the I-81/Crescent Corridor deal, in which relatively modest amounts of capital could unclog massive traffic bottlenecks, revving up the economy while saving energy and lives. Many of these projects have already begun, like Virginia’s, or are sitting on planners’ shelves and could be up and running quickly. And if we’re willing to think bigger and more long term—and we should be—the potential of a twenty-first-century rail system is truly astonishing. In a study recently presented to the National Academy of Engineering, the Millennium Institute, a nonprofit known for its expertise in energy and environmental modeling, calculated the likely benefits of an expenditure of $250 billion to $500 billion 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 the nation’s carbon emission by 39 percent and oil consumption by 15 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.\*

#### Federal Support for Electrified Sparks Renewables Revolution, Solves Oil Dependence

Aki 8 (Helen, breakthrough generation fellow accredidation from US Green Building Council, “Railroads: Fast, clean and ELECTRIC”, 7/16/2008 http://thebreakthrough.org/blog/2008/07/railroads\_fast\_clean\_and\_elect.shtml Accessed: 7/1/12

A federal initiative promoting electrified rail could also nurture burgeoning renewable electricity markets. In urban areas, the electric rail would require electricity-providing substations every 20 or 30 miles. In remote areas, the rail would require its own high-voltage transmission lines. Their maintenance would provide hundreds of thousands or even millions of service jobs, and the electricity demand could provide novel opportunities for the installation of renewable electricity technologies, particularly wind. Drake excitedly suggests, Rail spur lines could also serve as sites for long rows of wind turbines. Today, the size of wind turbines is often limited by the capacity of local roads and bridges to support the large cranes involved, even though "larger and taller" is better in wind turbine economics. Rail mounted or rail delivered cranes to a series of wind turbines could potentially install 5 MW wind turbines now seen only at sea. Interestingly, Drake is disparaging of high-speed rail initiatives, asserting that there is not enough passenger demand to justify the installation of high-speed or semi-high speed rail over long distances. High-speed rails are greatly inefficient users of energy: Energy consumption increases with the square of the speed, a 190 mph train will use 3 times as much energy as a 110 mph train, a 220 mph train 4 times as much. The USA is not France: we simply cannot afford the "best" service in this generation and we do not have the energy to waste on maximum speed. However, Drake allows, high speed rails could provide both passenger transportation and serve as express freight lines. For example, fresh produce needs to be transported quickly, and the high speed rail could fill that important role. Think about it: even the average domestically-grown tomato travels over 1500 miles to make it into a sandwich (so reads the "[foodometer](http://www.youtube.com/watch?v=p4RCyxgz97g&e))"). Dependence on foreign oil, and oil in general, makes it more expensive for us to get around. Likewise, it imperils the journey of tomatoes and other vital goods everywhere. Electrifying existing rails, and committing large-scale federal investment to building and maintaining electric rail infrastructure, is a matter of national security. The California High-Speed Rail is an inspiring example of electric transportation progress. But electric rail on a national scale is a vital step towards maintaining economic and social security, and international competitiveness. Drake points out an example of a fundamental barrier which must be broken through before a large-scale, federal electric rail program can be initiated: The traditional reason/excuse given by US railroads for not electrifying is that the electrification infrastructure will be subject to heavy property taxes, and railroad diesel is tax free. This is an obstacle not faced by other national railroads, most of which have electrified.

#### Freight Rail Multiplies GHG and Oil Consumption Reductions in Other Sectors, Solves Alt Causes

Economic Policy Institute ‘10

The Economic Policy Institute (EPI), a non-profit, non-partisan think tank, was created in 1986 to broaden discussions about economic policy to include the needs of low- and middle-income workers. Full Speed Ahead: Creating Green Jobs Through Freight Rail Expansion,

<http://www.buildingindiananews.com/BGA-Freight-Rail-Report-FINAL.pdf>, May

These projections factor current market trends and do not account for concerted efforts undertaken to combat foreign oil dependence and the effects of climate change. Given transportation’s impact on both of these fronts, making progress on oil savings and reducing GHGs will accelerate the need to capitalize on efficiencies already achieved within the freight rail industry. Expanding freight rail capacity will not only help achieve energy savings and pollution reductions within the sector, but also guarantee that other industries are not left to carry additional burdens of emissions reductions to meet overall climate change goals. It would also increase the ability of higher and high-speed rail to move people more efficiently and reduce congestion on our nation’s roads.

#### The United States Provides A Global Model, Making Huge In-Roads to Climate Change

**Association of American Railroads** (AAR), an industry trade group representing primarily the major freight railroads of North America, April 2011 [“America’s Freight Railroads: Global Leaders”] <http://www.aar.org/~/media/aar/Background-Papers/Americas-Freight-RR-Global-Leaders.ashx>

As the Federal Railroad Administration has noted, “By many measures, **the U.S. freight rail system is the safest, most efficient and cost effective in the world.” America’s freight railroads greatly enhance our nation’s competitiveness in the global economy. Countries all over the world have restructured their freight rail systems and looked to the United States for guidance.** **The U.S. freight railroad industry is the envy of the world. The United States is** at or near **the top among all countries in terms of** miles of **freight railroad, the condition of rail infrastructure and equipment, the amount of freight carried by rail, rail productivity, and other key rail-related measures. U.S. freight railroads are also the most affordable among the world’s major countries.**  According to data from the World Bank and other sources, U.S. freight rail rates (measured by revenue per ton-mile) are half those in major European countries and well below China and Japan as well. As the World Bank’s Lou Thompson has noted, “Because of a market-based approach involving minimal government intervention**, today’s U.S. freight railroads add up to a network that**, comparing the total cost to shippers and taxpayers, **gives the world’s most cost-effective freight service.**” Adjusted for inflation, average U.S. freight rail rates (measured by revenue per ton-mile) were 51 percent lower in 2010 than in 1980 — saving consumers billions of dollars each year in lower shipping costs. **The global dominance of America’s freight rail industry is a direct consequence of a balanced regulatory system.** Railroads can largely decide for themselves what rates to charge, how assets should be used, and what services to offer. Meanwhile, regulators protect shippers against unreasonable railroad conduct and unreasonable railroad pricing. **This ensures that freight rail in the United States is fair and competitive, and that railroads are held accountablefor their actions.** The U.S. rail model is of “vertical integration,” in which a railroad generally both owns the track and operates trains over that track. **The efficient U.S. model has resulted in huge productivity gains, sharply lower average rail rates, and massive reinvestment by railroads back into their systems.**

## Extensions

### Oil Dependent Now

#### Oil Dependent Now

Harris 4-3

David, Executive Director, AJC, and Senior Associate, St. Antony's College, Oxford University, “America's Achilles' Heel,” http://www.huffingtonpost.com/david-harris/americas-achilles-heel\_b\_844135.html

Ever since 1973, when the Arab Organization of Petroleum Exporting Countries (AOPEC) first imposed a crippling oil boycott, one president after another has promised to wean us off our dependence on unstable sources of oil. With great solemnity, our leaders have spoken of the dangers of our vulnerability, while pledging to usher in a new energy era. Yet, nearly four decades after the first oil shock, startlingly, our dependence on imported oil has jumped from one-third of total consumption to nearly two-thirds. So much for pledges and promises. Meanwhile, take a country like Brazil, nearly the size of our own. In 1973, it imported approximately 80 percent of its oil needs. Today, by contrast, the country is self-sufficient. The difference between the United States and Brazil? Above all, national will. Brazil's leaders didn't just talk up a good game. They acted with determination. They shifted vehicles to flex fuel, drawing on domestically-grown sugar cane to produce ethanol. They focused on renewable energy sources and made great strides. They explored for offshore oil and found vast deposits. The results speak for themselves. How tragic that we haven't quite followed suit! Take sugar-based ethanol as one telling example of the mess we're in. It's been tough to import for our vehicles. Why? Thanks to corn-growing states fearful of the competition, we've put in place high tariffs that make it prohibitively expensive to import from Brazil. That leaves us with corn-based ethanol, whose energy yield is approximately one-seventh -- yes, one-seventh -- of its sugar-based counterpart. We've had one chance after another to get serious, but to no avail. Think back to President Jimmy Carter's efforts to set an example of energy efficiency in the White House. Rather than emulate him, many Americans derided the chief executive. How dare we Americans be asked to drive less, drive slower, drive smaller, stay cooler in winter, or warmer in summer! Aren't these all violations of our birthright? Perhaps our best chance to get off the dime came right after 9/11. President Bush had the American people in the palm of his hand. He could have asked for just about anything he billed as serving America's vital interests, and he would have gotten it. At AJC, we urged the White House to seize the moment. We even had the chutzpah to draft a speech we hoped the president might deliver on the need to get serious -- and fast -- on energy security, and shared it with top White House advisers. But, in the end, the president didn't seize the moment and, within a short time, we were back to the all-too-familiar pattern of partisan and interest-group squabbling when it comes to energy. The result is that today we're on tenterhooks as Middle East crises unfold one after another, fearful of where the oil will come from, how much more prices will rise, and whether more costly oil will damage the chances for a sustained economic recovery.

### Freight Rail Key to Oil Dependence

#### Surface Freight Transportation is the Largest Internal Link to Oil Dependence

Economic Policy Institute ‘10

The Economic Policy Institute (EPI), a non-profit, non-partisan think tank, was created in 1986 to broaden discussions about economic policy to include the needs of low- and middle-income workers. Full Speed Ahead: Creating Green Jobs Through Freight Rail Expansion,

<http://www.buildingindiananews.com/BGA-Freight-Rail-Report-FINAL.pdf>, May

Right now, the U.S. is being outpaced by the global competition in terms of infrastructure investment. Overall infrastructure investment in the U.S. is estimated at $150 billion per year through the next decade, while the European Union expects to invest nearly $300 billion per year and China, $200 billion per year through the same timeframe. vii At a time when domestic investment is desperately needed, America sends more than $1 billion each day to foreign countries to purchase oil. American imports of foreign oil have risen by nearly 40 percent since 1990, and currently imports supply the bulk (57 percent) of American oil use. Transportation, meanwhile, accounts for two-thirds of U.S. oil consumption, and fuels derived from oil currently drive nearly all transportation activity (98 percent). Within transportation, surface freight movement (including trucking, water-borne freight and freight rail) represents a considerable segment of energy usage, consuming the equivalent of the amount of oil we import from Saudi Arabia, Nigeria and Venezuela annually. ix

### Supply Shocks

Oil Market Stretched Thin Now—Hormuz Shutdown Create Massive Shocks

The Economist ‘12

The new grease? How to assess the risks of a 2012 oil shock Mar 10th 2012 http://www.economist.com/node/21549949

But slightly rosier growth prospects are only part of the story. A more important driver of dearer oil has been disruptions in supply. All told, the oil market has probably lost more than 1m barrels a day (b/d) of supply in recent months. A variety of non-Iranian troubles, from a pipeline dispute with South Sudan to mechanical problems in the North Sea, have knocked some 700,000 b/d off supply. Another 500,000 b/d or so of Iranian oil is temporarily off the market thanks both to the effects of European sanctions and a payment dispute with China. The cushion of spare supply is thin. Oil stocks in rich countries are at a five-year low. The extent of OPEC’s spare capacity is uncertain. Saudi Arabia is pumping some 10m b/d, a near-record high (see chart 1). And there is the threat of far bigger supply disruptions if Iran were ever to carry out its threat to close the Strait of Hormuz, through which 17m barrels of oil pass every day, some 20% of global supply. Even a temporary closure would imply a disruption to dwarf any previous oil shock. The 1973 Arab oil embargo, for instance, involved less than 5m b/d.

#### World oil market is tight – new supply disruptions collapse the global economy recovery.

Wolf 3/27

Martin Wolf, associate editor and chief economics commentator at the Financial Times, widely considered to be one of the world's most influential writers on economics. “Prepare for a new era of oil shocks”. The Financial Times. March 27, 2012. http://www.ft.com/intl/cms/s/0/41ba759a-7730-11e1-baf3-00144feab49a.html#axzz1qNuyqGNk

Yet, despite the absurd politicking, we should be concerned about the economic impact of high oil prices: a rise of $10 in the price of oil shifts $320bn a year from higher-spending consumers to lower-spending producers, within and across countries. The 15 per cent rise since December 2011 would shift close to $500bn. The real price of oil is also very high, by historical standards (see chart). Further rises would take the world into uncharted territory. In short, higher oil prices are a threat. So what is going to happen? In a recent note, Goldman Sachs argues that a 10 per cent rise in oil prices tends to lower US gross domestic product by 0.2 percentage points after one year and by 0.4 percentage points after two. In the European Union, the impact is smaller: a reduction of 0.2 percentage points in the first year, but no further reduction thereafter. Since the actual rise has been 15 per cent since December, the impact on US and EU GDP would be a reduction of 0.3 percentage points over the first year – appreciable, but not calamitous. Such a price rise would lower US household incomes by about 0.5 per cent. Moreover, crossing the threshold of $4 a gallon might be significant when confidence is fragile, as it is now. Goldman also suggests the factors that would determine the size of any adverse impact. The first is whether the rise in prices is caused by demand or a shock to supply, with the latter being more disruptive. The answer, it suggests, is that demand is now the principal cause of higher prices, though the tightening of sanctions on Iran would be more important. The Paris-based International Energy Agency, in its latest monthly report, even qualifies this view. It agrees that “there may be no actual physical supply disruption at present deriving from the Iranian ‘issue’. But there are ongoing non-OPEC outages totalling around 750,000 barrels a day”. The second factor is how much spare capacity exists. The answer: not much. Inventories in high-income oil markets are low (see chart). Saudi Arabian production is now at 30-year highs, which suggests limited spare capacity. Moreover, the growth of world oil supply has been persistently slow, at just below 1 per cent a year over the past decade, despite generally high oil prices. Thus, capacity is structurally tight. That explains the level and the volatility of prices over the past decade. With potential global economic growth at 4 per cent a year, oil supply growing at 1 per cent and the lack of easy alternatives to oil as a transport fuel, supply is likely to become tighter. A third factor is what is happening in other commodity markets. Here the news is good: natural gas prices have been falling, while agricultural prices have not been so much of a problem this year. This should limit the inflationary impact. A final consideration is the monetary response. Here the news remains favourable. Central banks are likely to ignore movements in commodity prices, particularly ones whose impact is contractionary, provided they see no pass-through into wages. They are right to do so. In all, Goldman concludes, the price increase is a “brake”, not a “break”, in growth. But Fatih Birol, the IEA’s chief economist, warns against too much complacency. He notes that the EU’s net imports of oil will cost 2.8 per cent of GDP at present prices, against an average of 1.7 per cent between 2000 and 2010. Given the frailties of the EU economy, the dangers are evident. Furthermore, in this stressed oil market, further spikes in prices are quite possible. A war with Iran may be the most frightening possibility. But danger is always present, given the political instabilities in places where oil is produced. Moreover, the world is going to remain stuck in this danger zone, given the soaring demand for oil from rapidly growing emerging countries. The IEA suggests that Chinese sales of private light-duty vehicles will reach 50m a year by 2035, even under an energy-efficient scenario. The implications of such growth in vehicle fleets are quite obvious. The world will be vulnerable to high oil prices and repeated shocks, so long as supply is stagnant, demand buoyant and unrest likely – in short, so long as it remains as it now is. For the US, the best response would be to lower the oil-intensity of its economy, to reduce vulnerability to these shocks. Higher prices would help deliver this. But why does it let all the revenue go to foreigners? It makes far more sense to tax imports and keep some of it, instead.

#### Shocks Coming Now: High Risk in Producers Leading to Speculation

The Economist ‘12

High drama Iranian threats are only one of many scares facing oil markets Feb 25th 2012 http://www.economist.com/node/21548272?zid=298&ah=0bc99f9da8f185b2964b6cef412227be

So what then is spooking oil traders? Temporarily, at least, some Iranian oil is off the market—reducing supply to Europe and China by perhaps 550,000 b/d in total. But markets would not be so concerned if Iran were an isolated black spot. The trouble is that oil has also stopped flowing at full tilt from South Sudan, over a pipeline dispute; Syria, because of embargoes; and Yemen, where oil workers are on strike. Even the North Sea, where old rigs are closed for repair, is causing problems. All this could account for more than 700,000 b/d in missing output. In all the world may have lost over 1.25m b/d of late. On top of actual disruptions, fears abound over supplies from Nigeria, Iraq and Bahrain (not to mention what may yet happen in Iran). Estimates of OPEC’s spare capacity, the oil market’s security blanket, vary. The organisation claims it can call upon about 2.5m b/d. Some analysts say the figure is far lower. Amrita Sen of Barclays Capital puts it at 1.7m b/d. Most of that spare capacity is in Saudi Arabia: it will be largely up to the Saudis to cope with disruptions as well as supplying another 1m b/d or so this year to meet growing Asian demand. But according to Goldman Sachs, the country’s production is already at a 30-year high. The bank says the world faces a trough in OPEC spare capacity just as the world economy is recovering, an unprecedented combination. Tight oil markets mean prices are unlikely to fall. Worse, with so little spare capacity future supply shocks could lead to sharp increases. As in horror flicks, danger lurks at almost every turn.

#### Supply Disruptions Coming—Drilling Empirically Can’t Solve

Lacey ‘12

[Stephen Lacey](http://thinkprogress.org/author/stephen/) is a reporter/blogger for Climate Progress, where he writes on clean energy policy, technologies, and finance. on May 10, 2012 [CBO Report: Boosting Oil Production Won’t Protect Americans From Gasoline Price Shocks](http://thinkprogress.org/climate/2012/05/10/481523/cbo-report-boosting-oil-production-wont-protect-americans-from-gasoline-price-shocks/) http://thinkprogress.org/climate/2012/05/10/481523/cbo-report-boosting-oil-production-wont-protect-americans-from-gasoline-price-shocks/

More domestic drilling does not make America less susceptible to global supply disruptions or protect consumers from gasoline price volatility, according to [a new analysis](http://www.cbo.gov/sites/default/files/cbofiles/attachments/05-09-EnergySecurity.pdf%22%20%5Ct%20%22_blank%22%20%5Co%20%22analysis) from the Congressional Budget Office. The CBO report reviewed different policies intended to make the country more energy secure, concluding that the only effective tool for shielding businesses and consumers from price spikes is to use less oil. Because oil is sold on the global market, CBO concludes that increasing domestic oil production would do little to influence rising gas prices in the U.S. These findings back up historical experience. According to **[an analysis](http://www.msnbc.msn.com/id/46822698/ns/us_news-life/t/more-us-drilling-didnt-drop-gas-prices-data-show/%22%20%5Cl%20%22.T6vQ01J_CU4%22%20%5Ct%20%22_blank%22%20%5Co%20%22analysis)** of 36 years of gasoline prices and domestic oil production conducted by the Associated Press, there is zero statistical correlation between increased drilling and lower prices at the gas pump. The CBO report creates a dilemma for drilling proponents. Even if increased drilling did substantially lower gas prices — which it has not – the agency says those lower prices would actually make the country less secure from price shocks: Policies that promoted greater production of oil in the United States would probably not protect U.S. consumers from sudden worldwide increases in oil prices stemming from supply disruptions elsewhere in the world, even if increased production lowered the world price of oil on an ongoing basis. In fact, such lower prices would encourage greater use of oil, thus making consumers more vulnerable to increases in oil prices. Even if the United States increased production and became a net exporter of oil, U.S. consumers would still be exposed to gasoline prices that rose and fell in response to disruptions around the world.

#### Supply Crunch Coming: Emerging Demand

The Economist ‘12

Feeling peaky Apr 21st 2012 The economic impact of high oil prices http://www.economist.com/node/21553034?zid=298&ah=0bc99f9da8f185b2964b6cef412227be

A number of countries (including Britain, Egypt and Indonesia) have turned from net oil exporters into importers in recent years. And although rich countries have curbed their energy-guzzling a little, demand continues to surge in emerging markets.

This has left the oil market very vulnerable to temporary supply disruptions, such as the war in Libya. Speaking at a conference in Dublin this week, organised by the Institute of International and European Affairs and the Association for the Study of Peak Oil and Gas, Chris Skrebowski, a consulting editor of Petroleum Review, argued that spare capacity in the oil market could be eroded by 2015.

### Supply Shocks: Saudi Arabia

#### Supply Crunch Coming—Saudis Are Running Out

Krane ‘12

Krane researches Gulf energy policy at Cambridge University's Judge Business School. [Wall Street Journal](http://www.reuters.com/article/2012/03/26/us-iran-usa-idUSBRE82P07120120326),

26 April, 2012 The End of the Saudi Oil Reserve Margin http://robinwestenra.blogspot.com/2012/04/saudis-unable-to-cushion-oil-supply.html

With domestic electricity demand rising 10% per year in Saudi Arabia, the kingdom now devours more than a quarter of its oil production—nearly three million barrels per day. International Energy Agency figures show that Saudi Arabia now consumes more oil than Germany, an industrialized country with triple the population and an economy nearly five times as large.

In the medium-term, Saudi Arabia is in danger of losing its all-important "reserve margin" of oil production that so often calms market volatility. Loss of this spare capacity would remove a crucial safety mechanism from the global economy, to say nothing of tying America's hands when it comes to future moves against oil states.

Longer-term, the kingdom's very exports are at risk. A projection by Jadwa Investment of Riyadh shows that, at current rates of consumption growth, the Saudi reserve margin will dwindle until it disappears sometime before 2020. At that point, the Saudis would begin diverting oil destined for export into the domestic market.

Following the trend further, Jadwa finds that Saudi Arabia will consume its entire production capacity of 12.5 million barrels per day at home by 2043. London's Chatham House finds that the kingdom will become a net oil importer even earlier, by 2038.

### Supply Shocks: Pirates

#### Shocks Coming Now—Pirate Attacks and Pipeline Vulnerability, Including Directly on U.S. Supply

Bettinger ‘10

Mark Bettinger is Director of Sierra Club’s Federal and International Climate Campaign. Dr. Bernard Finel is Director of Research and Senior Fellow at the American Security Project. Ann Mesnikoff is the Director of Sierra Club’s Green Transportation Campaign. Jesse Prentice-Dunn is a Washington Representative with Sierra Club’s Green Transportation Campaign. Lindsey Ross is a research associate for climate security at ASP. Ending our Dependence on Oil A M E R I C A N S E C U R I T Y P R O J E C T S I E R R A C L U B. M A Y 2 7 , 2010, <http://americansecurityproject.org/wp-content/uploads/2010/10/Ending-our-Dependence-on-Oil.pdf>

Pirate attacks doubled from 2007 to 2008, 19 and in 2009 the number of attacks surpassed 400 for the first time in six years. 20 Nearly triple the number of ships were fired upon in 2009 compared to the year before. 21 What is more, most attacks are made in close proximity to three main sea lanes used by oil tankers. This list includes the Somali coast, at the exit to the Persian Gulf and Red Sea; it includes waters close to the Strait of Malacca; and, it includes the Caribbean, home to numerous shipments headed to the American Gulf Coast. 22 In 2008, pirates captured the Sirius Star, a 1,000-foot long, 350,000-ton ship, in the Gulf of Aden. 23 With over 2,600 tankers transporting oil globally, there is no shortage of options for those seeking targets.Moreover, pipelines, the only existing alternative for oil transport, are a highly attractive and susceptible target for terrorists. Attacks on Iraq’s pipelines and oil facilities, over 450 in five years, provide only one country’s example of such attacks. 25 Vulnerabilities are not limited to politically unstable communities across the ocean. In 2001, a drunken hunter shot an Alaskan pipeline, resulting in a $7 million dollar clean-up. 26 Some experts place costs to protect this infrastructure at $50 billion annually. 27 Other analysts believe annual costs to be as high as $132.7 billion. 28 Despite the disparity, and be it choke points, pirates or pipelines, additional risks impose additional – and significant – costs both to our national security and to our economy. 24

### Supply Shocks: SLOCs

#### Oil Shocks Coming Now—SLOC Attacks

Bettinger ‘10

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There are a variety of choke points though which vessels must travel, providing many countries with the opportunity to attack, and have the capacity to harm our ships. More than 50 states possess large stockpiles of anti-ship missiles. 14 Lebanon’s Hezbollah, a terrorist group, employed such weapons against Israel in 2006. 15 Iranian missiles threaten nearly 20 percent of the world’s oil transit vessels which travel through the 21 mile-wide Strait of Hormuz. 16 The same percentage of petroleum travels the 1.7 milewide Strait of Malacca between Malaysia and Indonesia. The Strait of Malacca is not only under a constant threat from militants and pirates, but many ships fall victim to poor visibility causing numerous collisions and near misses that threaten environmentally disastrous spills. 17 Terrorists are also suspected of targeting the Turkish Straits, Bad El-Mandeb, and the Panama Canal. Bad El-Mandeb, a narrow strait between Yemen and the Horn of Africa, has been the site of successful attacks on oil freight both against the Americans and French in the recent past

### Peak Oil

#### Peak Oil Now

McKay ‘12

By Andrew McKay Seven Myths Used To Debunk Peak Oil, Debunked 06 May, 2012 http://www.countercurrents.org/mckay060512.htm
Similar to the phony global warming “debate,” many, but not all of [the most vocal deniers](http://transitionvoice.com/2011/11/peak-oil-gets-pepper-sprayed/) are politically conservative, pro-business. And, by their refusal to take into account basic statistics, they’re anti-science. In terms of reduced energy use per capita, and the inevitable downsizing of the global economy, deniers are ideologically opposed to what happens now that we’re living in a post-peak world. So what are their arguments, and why are they so wrong? The top seven are listed below: 1. Peak oilers say oil is running out, it’s not At best this is a misunderstanding; at worst it’s a straw-man fabricated to cast doubt on the assertions of those concerned with the realities of peak oil. No peak oiler worth their salt has ever argued that we’re running out of oil. Sure, there may have been a couple of fringe bloggers arguing the case alongside conspiracy theories about alien abduction cover-ups and laser guided death unicorns, but no one takes them seriously. The issue isn’t when oil will run out. It’s about when conventional oil extraction peaks, which happened in 2006 according to the [IEA’s 2010 World Energy Outlook](http://transitionvoice.com/2010/12/top-10-peak-oil-stories-of-2010/). Unconventional oil has filled the gap for now (along with decreased use), but there’s much skepticism as to how long this can last. 2. Fracking will save us from peak oil While it’s certainly true that the massive increase in hydraulic fracturing of natural gas was largely unforeseen by the peak oil-aware, it’s merely a game extender, not a game changer. The small amount of oil that arises as a byproduct of fracking accounted for less than 5 percent of daily US consumption last year. This is even after a 750 percent increase in tight oil production since 2003. Clearly there would need to be an unprecedented increase in exploration and drilling for oil from fracking to even begin making a dent in the wider scale of things. But that’s before we consider damage to the environmental commons — land, air, and water — from the fracking process. The other trouble with fracking is that production figures for individual wells [commonly decline 60-80 percent](http://transitionvoice.com/2010/11/great-white-shale/) in the first year followed by a more gradual decline. This means new wells must constantly be drilled to avoid production for a whole area dropping off very quickly. The [US Energy Information Administration](http://www.eia.gov/) (EIA) forecasts that domestic production of tight oil will max out at 1,325,000 barrels a day by 2030. This is only 7 percent of the current US daily consumption. No one seriously believes that the US economy can grow without increasing oil consumption. The numbers don’t stack up, it’s as simple as that. 3. The US is now, or will soon be, a net oil exporter The rise of tight oil extracted through fracking has been hailed as a new era for US energy independence. Some have even gone as far as saying that the US is now a “net oil exporter.” [The devil is in the details](http://transitionvoice.com/2012/04/love-and-money-why-chrisitianity-is-incompatible-with-capitalism/) however. On a Btu basis the US imported 58 percent of the oil it consumed in 2011. Now, it’s true that the US became a net “oil product” exporter in 2011 for the first time in over sixty years. This is, however, very different from being a net oil exporter proper. Gasoline, diesel, and heating oil made up the majority of these products. But much of this oil was initially imported as crude from overseas, refined in the US and then exported back out. This doesn’t make the US a net oil exporter. Total net crude and product imports did fall 11 percent in 2011 to 8.436 million barrels a day, the lowest point since 2005. And domestic oil output did rise 3.6 percent to 5.673 million barrels a day. But this still leaves a 48.7% difference between imports and domestic oil output, a huge gap that the IEA forecasts will not be closed as far out as 2035. Observant analysts don’t think it will happen ever. 4. Oil production is still increasing annually Like many peak oil denier myths this old gem is true up to a point. But only if you include unconventional oil, natural gas liquids, and biofuels. Which means that when you take those figures away you get…that’s right…a peak in the production of oil from conventional sources. And as we see from [the example in the US](http://ourfiniteworld.com/2012/04/09/what-the-new-2011-eia-oil-supply-data-shows/), it’s highly unlikely that unconventional plays will be able to take up much of the slack. 5. Saudia Arabia will ramp up production to ease prices soon Uh, no. Crude oil prices have been over US $100 a barrel since February 2011. This is after steadily climbing from a low of US $42 a barrel in December 2008, after the last recession killed demand. The question is, With oil prices so high for so long, why hasn’t Saudi Arabia stepped in already to ease prices? Saudi Arabia produced the highest amount in thirty years in November 2011 and then actually decreased output and exports the following month. The increased November output dropped prices by $3.00 per barrel to $107.97 for December 2011. The easing was short lived however, with average March 2012 prices sitting at $126.4 per barrel, the highest price since July 2008. Production capacity figures for OPEC countries are notorious for being inflated and there’s increasing skepticism that Saudi Arabia couldn’t produce any more oil even if it wanted to. 6. East Africa is the new Middle East [Madagascar](http://news.mongabay.com/2005/0930-madagascar_oil.html) has been targeted by Exxon and Norway’s [Statoil](http://www.statoil.com/en/Pages/default.aspx) since 2005. Statoil found a billion barrels of oil equivalent. That may seem like a huge find but consider these points. First, world oil consumption is about 80 million barrels a day, give or take, making it the equivalent of about 12 days of oil. Then compare the Madagascar finding to the largest conventional oil field in the world, Ghawar, in Saudi Arabia. It’s extracted 65 billion barrels of oil since 1951 from initial reserves of over 100 billion barrels. The Madagascar field extends down to Mozambique where Anadarko have found 1.3 billion barrels of oil. Further inland Tallow has found 1 billion barrels of proven reserves in the Ugandan Albert basin. Plenty of other African countries are now being explored by a number of interests but they have yet to show any major finds. Oil pundits might be saying “game on” but really all there is to show is a lot of wishful thinking which, at the end of the day, won’t fill the gas tank. I should know, I tried that plenty of times in my student days. The truth is that most of the new oil finds throughout the world are less than 2 billion barrels each. The global annual consumption is currently a little less than 33 billion barrels per year. There is a huge disconnect between the size of the fields currently being discovered and the predicted future demand for oil. 7. There’s always a new frontier The question is, Why do we need new frontiers if oil production isn’t peaking? It’s an odd concept that oil companies would spend millions of dollars in politically unstable countries and areas where the physical barriers are immense — such as the Arctic — just for the hell of it. The truth is the low hanging fruit has been picked. All the easy to access oil has been found and developed. What we’re seeing now is increased exploration in increasingly economically dubious areas such as the Canadian tar sands, [deepwater drilling](http://transitionvoice.com/2012/04/deepwater-what/), and fracking and horizontal drilling in tight oil plays. It ‘s as if the pundits pushing this line have never seen a globe before. The world is round. There is a finite amount of land and ocean that can realistically be developed to economically extract and refine oil. From all the evidence collated over the last few years it appears that we’re pushing up against these limits right now. The biggest oil find since the 1960s, the Kashagan oilfield in the Caspian Sea, has 13 billion barrels of proven reserves. Development of the field has, however, been plagued with funding problems after Shell shut its Caspian office in May last year. At this stage it’s unlikely this field will produce anything close to the original estimates due to ongoing delays with development. After denial, acceptance You have to give the deniers credit for being so tenacious about drumming up new magical thinking on how to outsmart Mother Nature. But in the end, their denial, especially as the lackeys of industry with their plutocratic ties to government, puts us at risk in terms of smart transitions to other ways to live and do business. At some point, the “peak oil debate” needs to go the way of the phony “global warming debate.” Into the dustbin of history, where it belongs, so the rest of us can get on with civilization 2.0.

#### Oil dependence will effect every facet of society if not checked soon

North American Steel Interstate Coalition 10, Steel Interstate System Concept, http://steelinterstate.org/topics/beyond-peak-oil-%E2%80%93-path-oil-free-mobility

North America’s near total dependence on diminishing oil resources for its transportation sector threatens the mobility of people and goods on which we are so heavily dependent for our quality of life. But political leaders of both parties here and governments around the world are not shooting straight with the people about the real extent of risk to the nation of continued oil-dependence. That risk may affect virtually every integrated part of the world economic system. Peaking oil production happens when the worldwide supply of petroleum reaches its highest feasible levels--oil is being pumped out faster than new reserves can be found and drilled. Just as President Obama noted after BP oil spill, the oil remaining under the earth is harder and more expensive to extract. What new oil fields that remain are in remote locations—like the blown out BP Deep Water Horizon well, a mile under the sea, or locked in Canadian tar sands—or beneath unstable or unfriendly nations. After "peak oil," world production will starts an inevitable decline. At its simplest, peak oil is about the application of the law of supply and demand to an increasingly scarce resource--petroleum--in a world where 95% of all products use oil as a feedstock or where oil is essential to production. Food production and transportation top that list. The result--sky-rocketing fuel prices. Because all the oil being produced is sold, there will quickly be more customers for oil than there is supply at the prevailing price. That price will begin an inevitable upward spiral. Supply interruptions are very likely to occur as nations decide to cut back on petroleum production to preserve their national inheritance for future generations or to speculate on a wildly explosive market. Peak oil places the industrialized world on the cusp of transportation chaos. The impacts on civil society and national defense could be catastrophic. It is incumbent on our national leaders to openly address issues surrounding the risks of petroleum dependency. Our leaders must not only inform and educate the public about the risks of Peak Oil but offer meaningful solutions to avoid or mitigate the worst risks to society and the economy.

### Oil Impact—Laundry List

#### **Oil Dependence Leads Crushes International Leverage, Leads Oil Shocks, Economic Collapse, and Draw In—Empirical Evidence**

Bettinger ‘10

Mark Bettinger is Director of Sierra Club’s Federal and International Climate Campaign. Dr. Bernard Finel is Director of Research and Senior Fellow at the American Security Project. Ann Mesnikoff is the Director of Sierra Club’s Green Transportation Campaign. Jesse Prentice-Dunn is a Washington Representative with Sierra Club’s Green Transportation Campaign. Lindsey Ross is a research associate for climate security at ASP. Ending our Dependence on Oil A M E R I C A N S E C U R I T Y P R O J E C T S I E R R A C L U B. M A Y 2 7 , 2010, <http://americansecurityproject.org/wp-content/uploads/2010/10/Ending-our-Dependence-on-Oil.pdf>

Our national security is affected by oil consumption on a number of fronts. First, many countries which supply the United States with petroleum are politically unstable, leaving the American people particularly vulnerable to shocks in oil supply resulting from domestic or regional conflicts. Second, and related, is the strategic challenge presented by our dependence. Our reliance on countries whose actions do not best align with our interests impedes our leverage in the international arena. And third, there are risks to oil infrastructure, including the shipment of petroleum via waterways and the pipelines and facilities which funnel it around the globe.While our largest single provider of petroleum, Canada, is a stable and friendly neighbor, the same cannot be said of the other countries responsible for our oil supply. 4 Even Saudi Arabia, an ally and our fourth largest supplier of petroleum products, 5 is rated as having a “high risk” for instability according to the Economist’s Political Instability Index. 6 Of the petroleum Americans consume, 57 percent is imported, and of this, 68 percent is supplied by countries at “high risk” or “very high risk” for instability. 7 In 2008, we received nearly 5 percent of our crude oil and products imports from Angola, a country with a corrupt, quasi-democracy still reeling from a lengthy civil war. 8 Nigeria, providing just under 9 percent, has a long history of government corruption, military rule and social unrest. The same is true of Algeria, another top supplier whose brutal 11-year civil war ended in the last decade and a country which continues to be a breeding ground for militants and insurgents. Even Mexico, a country with which we have good relations, suffers from social unrest and rampant crime. It, too, has a “high risk” of instability. An eruption of violence, government upheaval, or the like in any of these countries could lead to a spike in the global price of petroleum, as occurred in the 1970s following the Arab-Israeli conflict of 1973 and the Iranian Revolution in 1979. In both cases significant recessions followed. The cumulative cost of those recessions is on the order of several trillion dollars – a direct consequence of oil dependence. U.S. military involvement in such events may also become necessary to restore regional stability. Saddam Hussein’s threat to seize Kuwait’s oil reserves embroiled the United States in a cycle of conflict with Iraq that continues to this day and has cost thousands of American lives and three quarters of a trillion dollars.

### Oil Impact—Exn

#### **Without electrified rail oil shocks cause economy and food distribution collapse-causes extinction**

Drake 8, Alan, consulting engineer, “Multiple Birds-One Silver BB: A synergistic set of solutions focused on Electrified Railroads, 7/15/08, http://www.theoildrum.com/node/4301 Accessed: 6/26/12

Nations can be defeated in two ways: on the battlefield or by collapse of the Home Front. During World War I, both Russia and Germany were defeated by a collapse of their respective home fronts. In the author’s rough judgment, if the USA lost 6 to 7 million barrels/day of oil imports for 24 to 30 months, without any preparation or warning, and with a less than ideal crisis response, not only would the US economy collapse, but food distribution would become erratic as the effects of severe oil shortages cascade over time. If the USA cannot even feed its citizens, it is effectively defeated. Military analysts will immediately think of the Islamic Republic of Arabia replacing Saudi Arabia and other Gulf States, or the Straits of Hormuz being blockaded, or submarines around the Straits of Malacca stopping the flow of oil as part of a larger conflict. These are all credible threats to our national security and survival. There is a different threat, rarely considered. If the US dollar collapses, and the USA has to buy oil with its exports, cash instead of credit, oil imports could be reduced by 6 to 7 million barrels/day, depending upon the scenario. Such an economic scenario has the unpleasant result of the USA being defeated, but surrendering to no one. A siege without end. A related threat is posed by the post-Peak Oil world, where world oil exports are collapsing faster than world oil production. The economies of oil exporters boom, expanding domestic consumption and reducing their exports significantly faster than their production declines. A half dozen years after world oil and “all liquids” production peaks, world oil exports (not production, but exports) can be reduced by half, two thirds, or more. A number of real world examples of this Export Land Model have surfaced in the last few years. In the author’s opinion, this is the most likely scenario and a very real threat to national security - even survival.

### Oil Impact—China War

#### **Oil dependency creates US-China competition- war inevitable without** alternative energy

Reynolds 10 (Lewis, energy consultant and author of “America the Prisoner: The Implications of Foreign Oil Addiction and a Realistic Plan to End It”, “Seven Dangerous Side Effects of the U.S. Dependency on Foreign Oil”, 8-8-10, http://peakoil.com/production/seven-dangerous-side-effects-of-the-u-s-dependency-on-foreign-oil/)

It creates strained foreign relations and sets the stage for an unstable future. The entire U.S.-Middle East foreign policy has been structured around the obvious importance of the region for the world’s oil supply. Policy makers don’t like to discuss it openly, but oil is always the elephant in the room when it comes to U.S. foreign relations—even with nations outside the Middle East. One of the great questions in the context of geopolitical struggle for oil is whether the great oil consuming nations—which will soon include the U.S., China, Russia—will view one another as allies, competitors, or some combination of both. The U.S. has love-hate relationships with both countries. There is historic rivalry between the U.S. and Russia leading back generations. The relationship with China is murky at best. Events are already in motion that could set the stage for a U.S.-Chinese confrontation. Oil consumption continues to grow modestly in the U.S., but in China it is exploding. On a global scale, oil consumption will certainly continue to grow into the foreseeable future, yet there are considerable questions as to whether global production can be increased much beyond current levels if at all. With both the U.S. and China needing oil, competition is inevitable. Responsibility lies with both sides to take actions to avoid the long progression toward a conflict. A Sino-American energy war is far too likely if both countries continue on their present courses without developing substantial alternative energy sources.

#### Dependence Leads Security Complexes that Create Escalation of China-Japan Conflicts and US Draw In to Major Power War

Glaser ‘11

Reframing Energy Security: How Oil Dependence Influences U.S. National Security Charles L. Glaser cglaser@gwu.edu Professor of Political Science and International Relations Elliot School of International Affairs The George Washington University August 2011, epts.washington.edu/.../Glaser\_-\_EnergySecurity-AUGUST-2011.doc

Energy dependence might be most dangerous if it brings the United States into conflict with another major power. A key path along which this could occur is an energy-driven security dilemma between China and the United States. As noted above, U.S. oil supplies are not vulnerable to interruption by China, but China’s are vulnerable to the U.S. navy. Consequently, China faces this type of security dilemma, which has the potential to generate a variety of peacetime and crisis dangers. China began importing oil in the early 1990s and its imports have grown significantly since then. Chinese oil consumption doubled from 1995-2005 and is expected to double again by 2020. During this period Chinese domestic production is expected to remain flat; the amount of oil that it imports will grow rapidly, making up somewhere between 60 and 80 percent of Chinese demand. The vast majority of this imported oil—more than 85% —will cross the Indian Ocean and pass through the Strait of Malacca. The problem that China faces is that its sea lanes of communication for transporting this oil are dominated by the U.S. navy. Chinese experts are well aware of the potential implications of this vulnerability. The following statement by a Chinese scholar succinctly captures the situation: China cannot have control over development goals without corresponding control over the resources to fuel the economy. The simple fact is that China does not possess that control. More than half of U.S. oil imports are shipped via the sea lanes. The crucial difference is that China is almost helpless to protect its overseas oil import routes. This is an Achilles heel to contemporary China, as it has forced China to entrust its fate (stable markets and access to resources) to others. Therefore, it is imperative that China, as a nation, pay attention to its maritime security and the means to defend its interests through sea power (a critical capability in which China currently lags behind). In fact, the key danger facing China is likely not during peacetime, but instead during a severe crisis or war. Another Chinese scholar observes, “In the scenario of war across the Taiwan Straits, there is no guarantee that the United States would not enlist the assistance of its principal ally in northeast Asia (Japan) and other lesser allies (Singapore, the Philippines, and South Korea) to participate in another oil blockade against China.” Although China has been modernizing its navy for a couple of decades, it not only remains quite far from having the ability to challenge U.S. control of the SLOCs from the Persian Gulf to the Strait of Malacca, but the programs it could build in the medium term (10-15 years) would still leave this mission beyond reach. The near-term focus and top priorities for China’s naval modernization have been improving its ability to blockade Taiwan, and to deny and deter U.S. intervention in a Taiwan conflict. Beyond these top priorities, acquiring the ability to protect its SLOCs to the Persian Gulf is among the rationales for China’s naval modernization. However, apparently China’s leaders are still deciding whether to devote massive resources to this mission. There is the possibility that China could start to challenge U.S. dominance in the Indian Ocean by developing a string of land-based capabilities from which it could both launch attacks and base naval forces; China has started to develop the type of base structure required for these capabilities. In addition, China could try to weaken U.S. naval dominance by deploying sea-based assets that threaten, but do not match, U.S. forces—for example, a large attack submarine force. In any event, well before China’s navy can reach effectively into the Indian Ocean, its efforts to protect Taiwan and its territorial claims in the East China and South China Seas will pose a threat to U.S. allies, including Japan.Increased value of territory and alliance entrapment—Japan-China conflict in the East China Sea The combination of the increased value of territory and alliance commitments could draw the United States into a conflict between Japan and China. In this case, energy’s effect is indirect—energy is not the rationale for the U.S.-Japan alliance, but could contribute to the outbreak of war between China and Japan. China and Japan have an ongoing dispute over their maritime boundary in the East China Sea and, related, over the Senkaku/Diaoyu Islands. The East China Sea contains potentially large oil and gas reserves; estimates of their size vary substantially, with the high end around 100 billion barrels. China and Japan’s divergent views on their maritime boundary, which reflect self-serving interpretations of ambiguities in the UN Convention on the Law of the Sea, significantly influence how much of the East China Sea falls under their control and, more specifically, which petroleum reserves they own. One particular oil and gas field—Chunxiao—has been the focus of much controversy, among other reasons because China is drilling close to the line that Japan claims divides this field and Japan worries that China’s operations could siphon resources from its side of the divide. The maritime boundary dispute is intertwined with the countries’ dispute over the Senkaku/Diaoyu Islands, which are located in the South China Sea. This dispute is important not only because there may be substantial amounts of oil near the islands, but also because Japan’s territorial claim significantly influences the location of the line that it believes divides the South China Sea and increases the size of its exclusive economic zone. Energy has played a central role in fueling controversy in the East China Sea. Neither Japan nor China focused much attention on their claims to the Senkaku/Diaoyu islands until a 1968 UN survey found there could be significant amounts of petroleum near them. The related dispute over the maritime border is long standing, but did not become the focus of intense political disputes and military interactions until Japan reacted to China’s growing oil and gas exploration in areas that Japan maintains are contested. In 2008 China and Japan reached an agreement on joint development of East China Sea petroleum resources, but since then have failed to work out specific issues required for its implementation. Over the past couple of decades, low-level confrontations between China and Japan have resulted over both the island and maritime border disputes, with some increase in their frequency in recent years. Although the stakes do not appear to justify the risk of a large war, experts believe that these disputes are the most likely flash point between Japan and China and warn about the possibility of conflict. A conflict in the South China Sea war could draw in the United States. Although the United States does not take a position on these competing sovereignty claims, the U.S.-Japan security treaty commits it to Japan’s defense if conflict breaks out over these islands, because they are under Japanese administration and are therefore covered by the treaty. The United States reiterated this position in the fall of 2010, as controversy raged following the collision of Chinese and Japanese boats in the vicinity of the Senkaku/Diaoyo Islands. Others’ oil dependence decreases U.S. foreign policy leverage: China’s reluctance to sanction Iran A country’s oil dependence could reduce its willingness to adopt policies that would increase U.S. security, because those policies would damage the country’s energy interests. The clearest example may be the disagreement between the United States and China over sanctions targeted at stopping Iran’s nuclear weapons program. China has invested in large energy deals with Iran and now relies heavily on Iran for oil, which may be reducing its willingness to support sanctions. The United States favors harsh sanctions to convince Iran to shut down programs that will enable it to build nuclear weapons. China has consistently required that U.N. sanctions against Iran be significantly less severe than favored by the United States and its European allies. In addition, China has criticized unilateral U.S. sanctions that go beyond the most recent round of U.N. sanctions. Energy interests are not China’s only reason for opposing severe sanctions—others include the priority it places on respecting states’ sovereignty and possibly the lower priority that China places on nonproliferation, reflecting its lack of global power projection capabilities. But energy interests appear to be a key factor. A significant and growing fraction of China’s imported oil comes from Iran and Chinese oil companies have demonstrated a continuing interest in investing in Iran’s oil and natural gas industries. China worries that support for sanctions will reduce its access to Iran’s energy resources and, therefore, has worked to moderate the severity of U.N. sanctions. Of course, this raises the question of why China does not entirely oppose sanctions. A number of factors push China toward supporting them, including the increasing importance it places on stability in the Middle East, which could be jeopardized by nuclear proliferation, and the importance of preserving good relations with the United States, with which it shares much larger economic stakes. The result of these countervailing factors is China’s seemingly reluctant support for relatively modest sanctions. The security cost to the United States of China’s limited support for sanctions depends on two further debates that I merely flag here. First, there is an on-going debate about the effectiveness of economic sanctions: if sanctions are generally ineffective, or if they tend to be ineffective when the stakes for the state being coerced are very high, as is the case with Iran, then the limits that China’s has imposed on U.N. sanctions are less costly, because even more severe sanctions would have been unlikely to succeed. Second, there is the whole debate over the danger posed by nuclear proliferation: if proliferation in general is not dangerous, or if proliferation to Iran in particular is not very dangerous, then China’s obstructionism poses smaller security costs to the United States. NATIONAL SECURITY IMPLICATIONS AND POLICY CHALLENGES The preceding sections have laid out a variety of ways in which oil dependence could require the United States to use large-scale force to protect its interests. Oil’s influence can be direct—force is used to protect access to oil—but can also be indirect—concern about oil influences the formation of alliances, stains political relations, and constrains states’ foreign policies in ways that bring the United States into conflicts that are not over oil. These oil-fueled wars could be against a major power or a regional power. The final sections consider how oil-generated risks have changed over time and identify some key policy challenges. What is new and different? Because the United States has been concerned about energy security since at least the 1970s, we can gain some perspective by comparing current security dangers produced by oil dependence to earlier ones. Although identifying and exploring potential dangers is easier than estimating their magnitude, the preceding analysis does offer some useful comparisons. At least until the Arab Spring, the probability of U.S. involvement in energy-driven conflict in the Persian Gulf was arguably lower than over the past few decades. The clearest case for U.S. intervention would involve a cutoff of Saudi oil. A Saudi decision to embargo oil appears no more likely than in recent decades and less likely than in the 1970s; a key external threat—Saddam Hussein’s Iraq—has been eliminated; and Iran’s missile capabilities are as of yet incapable of crippling the Saudi oil complex. In addition, U.S. capabilities for intervening in a Persian Gulf conflict have grown, which should contribute to deterrence; and the U.S. need to intervene for all but the most severe oil interruptions has been reduced by enlargement of its strategic petroleum reserve and by its increased energy efficiency. Cutting in the other direction, increased demand for oil, largely reflecting economic growth in the developing world, is likely to outpace increasing supply, driving oil prices higher. Combined with reduced slack in the oil production system, the result could be greater price sensitivity to supply disruptions, which would increase U.S. incentives to intervene to restore the flow of oil. Given these countervailing trends, which do not clearly indicate a greater probability of severe disruptions, increased U.S. concern over the fast few years about energy security appears to reflect the higher price of oil and not an increased probability of conflict; that is, the fear here is more clearly about U.S. prosperity than U.S. national security. One exception to this otherwise positive assessment of the Persian Gulf reflects the future implications of Iranian nuclear weapons. A nuclear Iran would likely be more willing to use force to close the Strait of Hormuz and there are plausible scenarios in which this action leads to conventional, and possibly nuclear, conflict between the United States and Iran. This future possibility, however, has played virtually no role in the increased U.S. concern about energy security. The other key exception is the increased concern about the stability of the Saudi regime, which reflects the political upheaval that has swept across the Middle East. It seems clearer that the probability of energy-generated conflict has increased in Northeast Asia. China’s shift over the past two decades from oil exporter to substantial oil importer, combined with the vulnerability its SLOCs, creates the possibility of a security dilemma. China’s efforts to protect its sea lanes and/or to offset its new vulnerability by further increasing its ability to confront the United States in a Taiwan scenario could fuel negative political spirals that reduce both countries’ security. A very different logic could make conflict more likely between China and its neighbors. The growing value of oil and gas, combined with China’s increasing military capabilities and its increasing need for secure access to these energy resources, could make China more willing to use force to resolve island disputes in the East China Sea. The United States could get drawn into this conflict via its alliance commitment and concern for its credibility for protecting allies.

### Oil Impact—Iran War

#### Oil dependency causes war with Iran

Reynolds 10 (Lewis, energy consultant and author of “America the Prisoner: The Implications of Foreign Oil Addiction and a Realistic Plan to End It”, “Seven Dangerous Side Effects of the U.S. Dependency on Foreign Oil”, 8-8-10, http://peakoil.com/production/seven-dangerous-side-effects-of-the-u-s-dependency-on-foreign-oil/)

It gets us into wars. Oil has been at the center of many (indeed most) major military conflicts in the world, particularly those involving the West. From providing the impetus for Hitler’s invasion of the Soviet Union and Japan’s attack on Pearl Harbor in World War II to Saddam Hussein’s invasion of Kuwait, the resulting Gulf War, and, most would admit, the U.S. return to Iraq in 2003, oil has bred a century of conflict. To be sure, America has made some bad choices to guarantee the uninterrupted flow of oil, often acting in ways very much in conflict with our national identity. Although the costs of the wars we have fought, both in terms of blood and treasure, have been great, the compromise of American values is perhaps even more disturbing. It might be best to look at the war issue in the context of a war that hasn’t happened…yet. Take the U.S. relationship with Iran. For most of the 20th century, the U.S. and British governments supported dictators and manipulated the domestic political situation in Iran to ensure the continued flow of cheap oil, often at the expense of the nation’s people. Those policies backfired when the harsh rule of the U.S.-backed Shah was overthrown by a popular revolution. The Iranian population was left angry with the U.S., and the door was opened for the anti-American Islamic theocracy that followed. The path to power for the Iranian regime was laid, in no small part, by mistakes made by previous U.S. Administrations.

#### **U.S. Oil Demands Props Up Ahmadinejad and Funds Iranian Nucearization**

Bettinger ‘10

Mark Bettinger is Director of Sierra Club’s Federal and International Climate Campaign. Dr. Bernard Finel is Director of Research and Senior Fellow at the American Security Project. Ann Mesnikoff is the Director of Sierra Club’s Green Transportation Campaign. Jesse Prentice-Dunn is a Washington Representative with Sierra Club’s Green Transportation Campaign. Lindsey Ross is a research associate for climate security at ASP. Ending our Dependence on Oil A M E R I C A N S E C U R I T Y P R O J E C T S I E R R A C L U B. M A Y 2 7 , 2010, <http://americansecurityproject.org/wp-content/uploads/2010/10/Ending-our-Dependence-on-Oil.pdf>

Instability is not the only risk. Our dollars also undermine our efforts to support democratization and promote human rights around the world. Instead, in many instances, our oil imports fund governments actively hostile to our interests. Oftentimes, our oil purchases finance authoritarian regimes, strengthening and cushioning their power grab despite a lack of popular consent in their home country. Oil money furthers regional conflict and arms races. 10 Among the direct recipients of our petrodollars is Venezuelan President Hugo Chavez. Chavez has steadily chipped away the democracy of Venezuela, and he has actively sought to spread anti-American sentiment throughout the hemisphere. Venezuela is third only to Canada and Mexico in providing petroleum and crude oil products to the United States. 11 Iranian President Mahmoud Ahmadinejad is pursuing nuclear weapons and funds international terrorism. While Iran does not supply significant quantities of oil to the United States, our purchases keep prices high and increase funds for that regime.

#### Oil Dependence Leads to Iran War, Escalates to Nuclear Conflict

Glaser ‘11

Reframing Energy Security: How Oil Dependence Influences U.S. National Security Charles L. Glaser cglaser@gwu.edu Professor of Political Science and International Relations Elliot School of International Affairs The George Washington University August 2011, epts.washington.edu/.../Glaser\_-\_EnergySecurity-AUGUST-2011.doc

Energy dependence could draw the United States into a conflict in which a regional power was interrupting, or threatening to interrupt, the flow of oil. The economic costs of a disruption would determine whether the costs of fighting were justified. Similarly, the potential economic costs of a disruption would determine whether U.S. foreign and military policy should be devoted to deterring states from interrupting the flow of oil; more precisely, these economic costs would determine how much the United States should invest in the policies required for deterrence. Given the geographical distribution of oil, such a conflict would likely occur in the Persian Gulf. The greatest danger is probably posed by Iran—the Iraq War has greatly increased Iran’s power relative to Iraq, and Iran is acquiring improved missile capabilities and making progress toward having the capability to build nuclear weapons. The most disruptive Iranian action would be closure of the Strait of Hormuz, through which the vast majority of Persian Gulf oil must pass. Having identified the danger posed by dependence on oil that transits this strait (as well as the Strait of Malacca), a recent Council on Foreign Relations study concluded that the “United States should take the lead in building an infrastructure protection program that would be based on practical steps by relevant countries and address critical infrastructures and transit routes. Initial efforts should focus on joint planning, technical assistance, and military exercises, especially involving naval units operating near ports or along critical sea-lanes.” Although difficult to estimate the probability that Iran would attempt to close the strait, analysts have offered reasons for expecting the probability to be quite low: Iran would lose the oil revenue from its own exports; and Iran would likely be deterred by the probable costs of U.S. intervention, which could include the destruction of key military bases and occupation of some of its territory. Because so much oil flows through the strait, the United States would almost certainly respond to keep it open. Nevertheless, there are plausible scenarios in which Iran blocks the strait, for example, as retaliation for an attack against is nuclear weapons program or as a coercive measure if losing a conventional war. Careful analysis suggests that the United States would prevail, but that a successful campaign could take many weeks or more, and that oil prices would increase significantly during this period. Iranian acquisition of nuclear weapons would increase the risk of this scenario in two basic ways. First, Iran might believe that the possibility of escalation to nuclear weapons would deter the United States from responding, making Iran more willing to interrupt tanker traffic. Although basic deterrence logic says this calculation points in the correct direction, the United States might nevertheless intervene. The United States would question Iran’s willingness to escalate to nuclear use because America’s far larger and more capable nuclear forces would pose a formidable retaliatory threat. In addition, the United States would have incentives to make clear that possession of a small number of nuclear weapons by a much weaker state would not deter the United States from using conventional weapons in a limited war. Being deterred by the Iranian nuclear force would suggest that small nuclear arsenals provide tremendous potential for launching conventional aggression. As Barry Posen argued in a related context (the counterfactual case in which Iraq possessed nuclear weapons before deciding to invade Kuwait), “If the Iraqi conquest of Kuwait is permitted to stand, nuclear weapons will come to be viewed as a shield that protects conventional conquests from *any* challenger, including a great power heavily armed with its own nuclear weapons.” Consequently, the United States would have incentives to respond to Iranian aggression both to preserve its ability to deter conventional aggression by small nuclear states and to support its nonproliferation policy. Second, once a conventional conflict occurred, there would be the danger that U.S. conventional operations could increase the probability nuclear war. A number of paths are possible. The U.S. mine clearing operation required to open the strait would likely be accompanied by attacks against land-based Iranian targets. The United States would want to destroy the land-based anti-ship cruise missiles that Iran could use to threaten U.S. mine clearing ships; in addition, the United States would want to destroy Iranian air defenses that could be used to protect these missiles. These U.S. strikes would require large numbers of carrier-based aircraft flying sorties over a period of a few weeks or more. If Iran lacked confidence that U.S. aims were limited, it could feel compelled to put its nuclear forces on alert to increase their survivability, which would increase the probability of accidental or unauthorized nuclear attack. The United States could then have incentives to attack Iran’s nuclear force, either preemptively because it believed Iran was preparing to launch an attack or preventively because it faced a closing window of opportunity after which Iran’s nuclear forces would be survivable. A more subtle danger is the possibility of inadvertent nuclear escalation resulting from a situation in which Iranian leaders decide to escalate because they believe, incorrectly, that the United States has decided to destroy their nuclear force (or ability to launch it). U.S. conventional operations could create this danger by destroying Iranian radars, and command and control systems, leaving Iranian leaders unable to assess the U.S. conventional campaign and fearing that the United States was preparing to launch a full-scale invasion or a conventional attack against their nuclear forces.

### Oil Impact—Terrorism

#### Oil Dependence Leads to Foreign Policy Choices that Fuel International Terrorism

Glaser ‘11

Reframing Energy Security: How Oil Dependence Influences U.S. National Security Charles L. Glaser cglaser@gwu.edu Professor of Political Science and International Relations Elliot School of International Affairs The George Washington University August 2011, epts.washington.edu/.../Glaser\_-\_EnergySecurity-AUGUST-2011.doc

A commonly voiced concern is that U.S. policies for maintaining a reliable flow of oil increase the terrorist threat facing the United States. Whether U.S. oil policy in fact plays a significant role in fueling these threats depends on a central debate about the causes of terrorism and, specifically, about al Qaeda’s objectives. And whether the United States can avoid these dangers while continuing to protect the flow of oil depends on a major debate over U.S. grand strategy. Likely the most significant debate over al Qaeda is captured in the overly stark question “why do they hate us?” One answer is that the al Qaeda is reacting to U.S. policy in the Middle East—including deployment of U.S. troops in the Persian Gulf, unwavering support for Israel, cooperation with corrupt regimes, control over the region’s oil resources, and invasion and occupation of Iraq. A related and more specific argument is that foreign occupation is the driving force behind suicide terrorism, and more specifically that U.S. forces deployed in the Persian Gulf are the driving force behind the al Qaeda threat to the United States. Robert Pape finds that “national resistance to foreign occupation, a democratic political system in the occupying power, and a religious difference between the occupied and occupying societies are the main causal factors leading to the rise of suicide terrorist campaigns.”

### Oil Impact—Escalation

#### New Term Supply Crunch—Military Draw In and Huge War

Bettinger ‘10

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Economic disruptions have a variety of sources. In 1973 and 1979, energy prices spiked as a result of events in the Middle East and Persian Gulf. American economic growth during this time suffered by trillions of dollars. 29 Increasing demand worldwide will also result in price increases – and other, more serious issues. Our economic vulnerabilities as they concern the Persian Gulf have been especially exploited during the last couple of decades. War in 1991 in the Persian Gulf was waged to prevent Saddam Hussein from controlling Kuwait’s oil reserves, which would have brought what today constitutes approximately 30 percent of the world’s proven oil reserves under his control. 30 Nearly two decades and another war in the region later, we are still fighting to bring stability to Iraq and spending billions to do so. Today, over 21 percent of our imports arrive from this region. 31 Sky-rocketing oil prices in 2007 and 2008 provide another example of our vulnerability to shocks in the oil market. Increasing global demand, particularly in developing nations, will affect global oil prices and the American consumer significantly. Current projections suggest that prices will likely continue to rise, easily surpassing the 2008 highs in coming years, though these projections vary based on assumptions about the value of the dollar, annual interest, inflation and unemployment rates. 32 The U.S. military has also expressed concern over our oil dependence. Global energy demand, the military projects, will increase by 50 percent by the 2030s. Fossil fuels, at 80 percent, will constitute a majority of the energy supply – barring, of course, significant investment in alternative sources before this time. Sixty percent of fossil fuel usage, the Joint Operating Environment 2010 Report predicts, will be in the form of gas and oil. Supply, however, is unlikely to keep pace with demand – but not for the reasons one might suspect. Even with conservative growth estimates, if we continue business as usual, insufficient refining capacity, as well as a shortage of drilling platforms and engineers – not a lack of petroleum reserves – will make it impossible to meet worldwide demand.

### Oil Impact—Caspian/Russia War

#### Oil Dependence Leads to Entanglement of NATO in the Caspian and Escalating Conflicts with Russia

Glaser ‘11

Reframing Energy Security: How Oil Dependence Influences U.S. National Security Charles L. Glaser cglaser@gwu.edu Professor of Political Science and International Relations Elliot School of International Affairs The George Washington University August 2011, epts.washington.edu/.../Glaser\_-\_EnergySecurity-AUGUST-2011.doc

An alliance formed to protect access to energy can draw a state into a conflict that it would otherwise have avoided. Expanding NATO to include Georgia runs this risk, including increasing the probability of a conflict between NATO and Russia. The United States’ interest in including Georgia partially reflects its desire to maintain secure access to oil and gas resources that need to transit the Caspian Sea region. Following the dissolution of the Soviet Union, the United States initially showed little interest in the Caspian region, but started to pay greater attention as the extent of the region’s energy resources became clearer. Relatively quickly, the United States came to see the Caspian region playing an important role in helping diversify the sources of U.S. energy, reducing western reliance on the Persian Gulf. A key component of U.S. strategy focused on development of pipelines that could transport oil and gas from the region’s landlocked countries, while not crossing Russian territory. The United States became the leading proponent of a pipeline that ran from Baku to the Turkish city of Ceyhan by way of the Georgian capital, Tbilisi. The United States did not invest directly in these energy projects, but did devote diplomatic and institutional financial resources to help accomplish them. In addition, the United States made broader investments in the stability and security of the region, providing economic and military assistance, with Georgia being the largest recipient of these forms of U.S. aid. As a continuation of these policies, energy considerations have influenced what is likely to be among the most potentially consequential decision the United States is going to make concerning the security of the region—including Georgia in NATO. The debate over NATO expansion has been divisive from the outset and proponents have advanced a variety of arguments, including the value of spreading democracy, contributing to domestic stability and hedging against a resurgent Russia. In addition, however, energy considerations are a significant factor in the case that is now being made for bringing Georgia into the alliance, as evidenced by the following quote from Ronald Asmus, who has been an influential and long-standing supporter of NATO expansion: many Europeans do not feel the same historical or moral commitment to them or see a compelling strategic need to integrate them. Thus, in addition to moral and political arguments, the United States and Europe need to articulate a strong strategic rationale for anchoring them to the West. That argument is straightforward. The challenge of securing Europe's eastern border from the Baltics to the Black Sea has been replaced by the need to extend peace and stability along the southern rim of the Euro-Atlantic community -- from the Balkans across the Black Sea and further into Eurasia, a region that connects Europe, Russia, and the Middle East and involves core security interests, including a critical energy corridor. Working to consolidate democratic change and build stability in this area is as important for Western security today as consolidating democracy in central and eastern Europe was in the 1990s. NATO agreed in 2008 that Georgia would become a member of the alliance and reconfirmed this decision 2010. Without entering into the entire debate over NATO expansion, a strong case can be made that including Georgia in NATO would likely increase the probability of war between the United States and Russia. Russia and Georgia fought a short war in August of 2008, Russia has recognized the separatist Georgian provinces of South Ossetia and Abkhazia as independent states, and Russia continues to play an active role in these provinces. Including Georgia in NATO would likely contribute to deterring Russia from launching another war against part of Georgia. At the same time, however, if deterrence fails, NATO’s security commitment would greatly increase the probability of its actually fighting against Russia. Among other factors, the prospects for deterrence are reduced by the complications created by Russia’s recognition of the provinces and the West’s rejection of this new status.

#### Future efforts to Secure our oil supply will leads to a russia-us war.

Klare 2008

(Micheal T. Klare, The Nation*’s defense correspondent, is professor of peace and world security studies at Hampshire College. “*The New Geopolitics of Energy*”* [The Nation](http://proquest.umi.com/pqdweb?RQT=318&pmid=29240&TS=1214343341&clientId=42567&VInst=PROD&VName=PQD&VType=PQD). New York: [May 19, 2008](http://proquest.umi.com/pqdweb?RQT=572&VType=PQD&VName=PQD&VInst=PROD&pmid=29240&pcid=39304061&SrchMode=3). Vol. 286, Iss. 19;  pg. 18)

The great risk is that this struggle will someday breach the boundaries of economic and diplomatic competition and enter the military realm. This will not be because any of the states involved make a deliberate decision to provoke a conflict with a competitor--the leaders of all these countries know that the price of violence is far too high to pay for any conceivable return. The problem, instead, is that all are engaging in behaviors that make the outbreak of inadvertent escalation ever more likely. These include, for example, the deployment of growing numbers of American, Russian and Chinese military instructors and advisers in areas of instability where there is every risk that these outsiders will someday be caught up in local conflicts on opposite sides. The danger, of course, is that the great powers will be sucked into these internal conflicts. This is not a far-fetched scenario; the United States, Russia and China are already providing arms and military-support services to factions in many of these disputes. The United States is arming government forces in Nigeria and Angola, China is aiding government forces in Sudan and Zimbabwe, and so on. An even more dangerous situation prevails in Georgia, where the United States is backing the pro-Western government of President Mikhail Saakashvili with arms and military support while Russia is backing the breakaway regions of Abkhazia and South Ossetia. Georgia plays an important strategic role for both countries because it harbors the Baku-Tbilisi-Ceyhan (BTC) pipeline, a US-backed conduit carrying Caspian Sea oil to markets in the West. There are US and Russian military advisers/instructors in both areas, in some cases within visual range of each other. It is not difficult, therefore, to conjure up scenarios in which a future blow-up between Georgian and separatist forces could lead, willy-nilly, to a clash between American and Russian soldiers, sparking a much greater crisis.

### Russia War Outweighs

#### Russia-US war outweighs everything else

Bostrom 2

Nick, PhD, Journal of Evolution and Technology, Vol. 9, March 2002, http://www.nickbostrom.com/existential/risks.html

A much greater existential risk emerged with the build-up of nuclear arsenals in the US and the USSR. An all-out nuclear war was a possibility with both a substantial probability and with consequences that might have been persistent enough to qualify as global and terminal. There was a real worry among those best acquainted with the information available at the time that a nuclear Armageddon would occur and that it might annihilate our species or permanently destroy human civilization.[4] Russia and the US retain large nuclear arsenals that could be used in a future confrontation, either accidentally or deliberately. There is also a risk that other states may one day build up large nuclear arsenals. Note however that a smaller nuclear exchange, between India and Pakistan for instance, is not an existential risk, since it would not destroy or thwart humankind’s potential permanently. Such a war might however be a local terminal risk for the cities most likely to be targeted. Unfortunately, we shall see that nuclear Armageddon and comet or asteroid strikes are mere preludes to the existential risks that we will encounter in the 21st century.

### Oil Impact: Saudi Invasion

#### Oil Dependence Means the U.S. Would Invade Saudi Arabia To Secure Supply

Glaser ‘11

Reframing Energy Security: How Oil Dependence Influences U.S. National Security Charles L. Glaser cglaser@gwu.edu Professor of Political Science and International Relations Elliot School of International Affairs The George Washington University August 2011, epts.washington.edu/.../Glaser\_-\_EnergySecurity-AUGUST-2011.doc

Regarding the willingness and capability of suppliers, the United States could need to use force to protect major suppliers from invasion, especially if the invader could gain a dominant role in the oil market; from attacks against their oil facilities; and from domestic upheaval that could cripple their ability to sell oil. The 1991 Gulf War is probably the clearest historical example. The U.S. decision to eject Iraqi forces from Kuwait was intended largely to insure that Iraq did not extend its offensive into Saudi Arabia. The fear was that Iraqi control of Saudi oil would provide Iraq with such a large fraction of Persian Gulf oil that it could manipulate oil markets, severely damaging the U.S. economy. A key future scenario in which the United States might need to use force to protect the flow of oil involves a collapse of the Saudi regime.

### Plan Solves Oil Consumption

Freight Rail Transition Solves Oil Consumption

AAR 2008

Association of American Railroads, Overview of the America’s Freight Railroads, PDF, <http://www.aar.org/PubCommon/Documents/AboutTheIndustry/Overview.pdf>, May

Freight railroads offer major public benefits in addition to cost-competitiveness and efficiency. First, railroads are more fuel efficient than other modes of transportation. On average, railroads are three or more times more fuel efficient than trucks, and railroad fuel efficiency is improving all the time. In 1980, railroads moved a ton of freight an average of 235 miles per gallon of fuel. In 2007, the comparable figure was 436 miles, an 85 percent improvement. In fact, if just 10 percent of the freight that moves by highway moved by rail instead, annual fuel savings would exceed one billion gallons. And because of their fuel efficiency, every ton-mile of freight that moves by rail instead of truck reduces greenhouse gas emissions by two-thirds or more. Second, railroads are environ- mentally friendly. The EPA estimates that for every ton-mile, a typical truck emits roughly three times more nitrogen oxides and particulates than a locomotive. Other studies suggest an even greater advantage for railroads. Third, freight railroads help reduce highway gridlock. A typical train takes the freight equivalent of several hundred trucks off our highways. Overcrowded highways act as an “inefficiency tax,” seriously constraining economic growth. Freight railroads help relieve this restriction by reducing congestion, enhancing mobility, and reducing the costs of maintaining existing roads and the pressure to build costly new roads.

### AT: Domestic Drilling Solves

#### Oil Shocks Coming—High Risk of Supply Disruption and Peak Oil

McKillop ‘11

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In fact, physical supply cuts are in 2012 more possible or rational than at any time for the last 15-20 years, and perhaps even since 1973. Taking only a 15-20 year horizon, but looking the other way, the next 15-20 years will massively change world oil supply, and not for political reasons. Probably by 2017 if there is any recovery of the global economy, world oil supply will certainly "Peak Out". Like physicists trying to find Higgs bosons we can't give an exact number for the final and absolute peak: it might possibly be 95 million barrels a day, or about 6% - 7% above current production. Total's CEO Christophe de Margerie has gone on record saying he thinks even sustaining 90 Mbd is not possible under the best of scenarios - no supply cuts, no major stress in large producer countries, continued high investment in oil E&P at rates similar to the most recent record year of 2007 when $400 billion was spent - and so on. Without recession, world oil demand would have easily hit 90 Mbd in 2012. Getting an idea on how prices might move even with "moderate only" economic recovery and no supply cuts, more than 3 months back (on Sept 15) Goldman Sachs set a price of $130 a barrel as likely in 2012, with the famous spread or premium for Brent against WTI shrunk to almost nothing. The reason is this: Oil supply is short in both hemispheres. Any large outage of supply will destroy the price mechanism and physical rationing will be the only possible end result. Despite Libya coming back fast towards its pre-war output of 1.5 million barrels a day, the Arab world outlook is sombre - the Jasmine revolution and semi peaceful sit-ins were a long way back. Civil war is now the operating mode in the Arab revolt, and this makes worst-case scenarios possible. Revolt in the Middle East presently focusing Syria's civil war, the long simmering Iran nuclear crisis, rising sunni-shia struggle in Iraq now that the US has quit, and the latent threats to Saudi and other Gulf Arab producers are all able to impact oil supply security. Even the rising threats to Putin's total power in his version of "democratic" Russia, with fast rising potentials for long-winded internal power struggles, can affect Russian gas and oil production, supply policies and pricing action.

### Rail Infrastructure Collapse Coming Now

#### Railroad capacity has reached maximum; no alternative to rails

James McClellan, Woodside Consulting Group, December 1, 2010 [“Railroad Capacity Issues”]

<http://onlinepubs.trb.org/onlinepubs/archive/conferences/railworkshop/background-McClellan.pdf>

Capacity is a hot issue. Capacity, or rather the lack thereof, is getting a lot of attention in transportation circles these days. Urban highways are increasingly congested; there are bottlenecks at some important ports and even airport congestion has returned at many hub airports. Railroads, especially in the West, have absorbed huge increases in both train-miles and ton-miles in recent years. But now many railroad mainlines are at or near capacity. Railroads have responded by adding capacity as well as shedding some low-margin traffic to make room for higher-margin business. Railroad capacity is a national transportation issue. A railroad capacity problem would be of minor national importance were alternative modes able to handle substantial growth. But the reality is that highway construction is not keeping up with the growth in demand largely because of financing, environmental and community impact issues. Many public officials look to the railroads to provide a safety valve for a rising tide of freight traffic. If railroads obtain the capacity to handle growth, some pressure will be taken off the highway network. And if not, then highway congestion will get a lot worse, and both the cost and reliability of freight transportation will suffer.

### Now Key Time for Infrastructure

#### Key to Start Infrastructure Investment Now—Lead Time is Long But Projects Ready Now

Hamberger ‘8

STATEMENT OF EDWARD R. HAMBERGER PRESIDENT & CHIEF EXECUTIVE OFFICER ASSOCIATION OF AMERICAN RAILROADS BEFORE THE U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE SUBCOMMITTEE ON RAILROADS, PIPELINES, AND HAZARDOUS MATERIALS HEARING ON RAIL CAPACITY APRIL 23, 2008 Association of American Railroads 50 F Street NW Washington, DC 20001, <http://republicans.transportation.house.gov/Media/File/Testimony/Rail/04-23-08-Hamberger.pdf>

Like firms in every other industry, railroads have limited resources. Their ability to meet customer requirements is constrained by the extent and location of their infrastructure (both track and terminal facilities); by the availability of appropriate equipment and employees where they are needed; and by the availability of funds necessary to augment what they already have. The constraints railroads face — particularly those involving their physical network — cannot be changed quickly. It can take a year or more for locomotives and freight cars to be delivered following their order; six months or more to hire, train, and qualify new employees; and several years to plan, permit, and build new infrastructure.\*\*\*FOOTNOTE\*\*\* 3 Railroads typically have a number of projects far enough along in the planning process that construction can be initiated quickly if funds become available.

### Freight Rail Infrastructure Investments Solves: Laundry List

#### Investing in Freight Rail Infrastructure with Government Solves Unemployment, Emissions, and Oil Dependence

Economic Policy Institute ‘10

The Economic Policy Institute (EPI), a non-profit, non-partisan think tank, was created in 1986 to broaden discussions about economic policy to include the needs of low- and middle-income workers. Full Speed Ahead: Creating Green Jobs Through Freight Rail Expansion,

<http://www.buildingindiananews.com/BGA-Freight-Rail-Report-FINAL.pdf>, May

America is experiencing a jobless recovery from a pronounced and prolonged recession, which resulted in the attrition of millions of American jobs across all sectors of the economy. At the same time, the nation sends massive amounts of money overseas to support our dependence on foreign oil, while transportation represents a significant component of this oil dependence and consequent greenhouse gas pollution. Moving to a clean energy economy that reinvests in American industries and prioritizes efficient energy use and pollution reduction represents a significant opportunity to create jobs and promote sustainable economic growth. The freight rail industry can be a part of this transition, having demonstrated its green potential by making significant strides in efficiency, limiting pollution and creating and sustaining quality jobs. Economic models estimate about 7,800 green jobs are created for every billion dollars of freight rail capital investment. Furthermore, the industry has nearly doubled the amount of goods it has shipped without increasing fuel consumption over the past three decades, and creates a fraction of the pollution of other transport modes such as trucking and aviation. Its continued growth will generate green jobs, reduce dependence on foreign oil and contribute to solving climate change. As the U.S. economy gets back on track, freight movement will expand, requiring corresponding infrastructure investment. By growing capacity, the freight rail industry can seize significant opportunities to meet projected demand for shipping cargo, save energy, reduce pollution and create tens of thousands of new jobs throughout the economy. Freight rail invests more than four times the proportion of revenues into capital investment than most other industries, and creates public benefits by returning a high level of economic output, offering an alternative to other modes of transport that can reduce congestion and improve productivity, serving as the backbone for national passenger rail and achieving efficiencies that significantly reduce energy use and pollution. Public policy should account for these public returns and supply incentives that will help the industry maintain economic viability while delivering even greater economic and environmental benefits moving forward.

### Freight Rail Infrastructure Key to Chemical Industry

#### Railroads Are the Vital Internal Link to the Sustainability of the Chemical Industry

Weinstein & Clower 98

Bernard L. Weinstein, Ph.D. and Terry L. Clower, Ph.D. Center for Economic Development and Research The University of North Texas.THE IMPACTS OF THE UNION PACIFIC SERVICE DISRUPTIONS ON THE TEXAS AND NATIONAL ECONOMIES: AN UNFINISHED STORY Prepared for the Railroad Commission of Texas Denton, Texas February 9, 1998, [http://digital.library.unt.edu/ark:/67531/metadc30377/m2/1/high\_res\_d/Clower-1998-Impacts\_Union\_Pacific\_Service\_Texas.pdf](http://digital.library.unt.edu/ark%3A/67531/metadc30377/m2/1/high_res_d/Clower-1998-Impacts_Union_Pacific_Service_Texas.pdf)

The Gulf Coast's $105 billion chemical industry has probably been hit harder than any other manufacturing sector by the UP's service problems since virtually all bulk chemicals are shipped by rail. Furthermore, large chemical companies typically own or lease their own rail cars. Thus, diverting shipments to trucks and barges imposes significant incremental costs to chemical companies. A fall 1997 survey by the Chemical Manufacturers Association (CMA) found that 213 major production facilities along the Gulf Coast had been affected by disruptions in service, placing a large number of jobs at risk. (Employment at these facilities exceeds 95,450). According to 31 responding companies, the average monthly costs of service disruptions during the summer totaled $34.1 million and are now running at $62.3 million per month. About two-thirds of the total costs arise from lost sales or production while another 23 percent is attributed to higher freight and shipping costs. The remaining incremental costs are attributed to lost rail car utilization, additional inventory carrying costs, the 8 higher cost of raw materials purchased from other producers, the cost of tracing rail cars, and other administrative expenses.

Chemical Industry Has a Fast Spillover to Every Other Sector of the Economy

Weinstein & Clower 98

Bernard L. Weinstein, Ph.D. and Terry L. Clower, Ph.D. Center for Economic Development and Research The University of North Texas.THE IMPACTS OF THE UNION PACIFIC SERVICE DISRUPTIONS ON THE TEXAS AND NATIONAL ECONOMIES: AN UNFINISHED STORY Prepared for the Railroad Commission of Texas Denton, Texas February 9, 1998, [http://digital.library.unt.edu/ark:/67531/metadc30377/m2/1/high\_res\_d/Clower-1998-Impacts\_Union\_Pacific\_Service\_Texas.pdf](http://digital.library.unt.edu/ark%3A/67531/metadc30377/m2/1/high_res_d/Clower-1998-Impacts_Union_Pacific_Service_Texas.pdf)

What's more, because industrial chemicals are essential raw materials for many other industries-- including agriculture, automobiles, construction, food processing, pharmaceuticals, plastics and electronics-- production delays and higher shipping costs attending the UP service disruptions are no doubt being felt by other sectors of the state and national economies. Though these costs are indeterminate at this time, inevitably they will show up in higher prices to wholesalers, distributors and consumers over the next six to twelve months.

### Freight Rail Key to Manufacturing

#### Freight Rail Infrastructure Improvement Key to Manufacturing Economy—Lack of Infrastructure Locks Out Recovery

Economic Policy Institute ‘10

The Economic Policy Institute (EPI), a non-profit, non-partisan think tank, was created in 1986 to broaden discussions about economic policy to include the needs of low- and middle-income workers. Full Speed Ahead: Creating Green Jobs Through Freight Rail Expansion,

<http://www.buildingindiananews.com/BGA-Freight-Rail-Report-FINAL.pdf>, May

The American economy is showing signs of recovery from the deepest recession in seven decades. While unemployment rates have crested, surpassing 10 percent in recent months but now slowly retreating, new approaches and investment are needed to get more Americans back to work and invigorate the U.S. economy. The country continues to face severe economic challenges, both cyclical and structural. Since the beginning of the recession in December 2007, the labor market has shed 8.2 million jobs. In order to keep pace with population growth, during this period it should have added 2.8 million jobs, meaning that the economy is effectively 11 million jobs below its pre-recession employment levels. To achieve this level within the next three years, the economy would have to add on average 411,000 jobs each month for 36 consecutive months. To illustrate just how unprecedented this job growth would be, in the peak year of job growth during the 1990’s expansion (1997), only 280,000 jobs were added on average each month. ii In other words, it will take the economy, which entered a recession more than two years ago, at least a few more years before it fully recovers, if not longer. Decline in Goods-Producing Jobs In previous decades, the U.S. economy has experienced a marked shift away from goods-producing jobs, such as those in the manufacturing, construction, natural resources and mining industries. From 1979 to 2007, the share of goods-producing jobs fell from 27.8 percent of total nonfarm employment to 16.1 percent. Despite the American workforce growing by over half during that period, in 2007, before the recession, there were 25.5 percent fewer goods-producing jobs in the U.S. than there were in 1979. iii While goods-producing jobs constituted about 16 percent of jobs at the start of the recession, they accounted for nearly half of the jobs lost through February 2010. This shift has significant implications for the economy moving forward. Manufacturing jobs, and goods producing jobs more generally, have historically been pathways to the middle class, especially for the 70 percent of the labor force that does not have a college degree. For workers with a high school degree or less, manufacturing jobs provide on average 9.2 percent higher wages than the economy-wide average. iv Higher rates of unionization among manufacturing jobs generally lead to better health care benefits, pensions, and job security. For workers, these Economic models estimate about 7,800 green jobs are created for every billion dollars of freight rail capital investment. characteristics make manufacturing jobs a vital rung in the climb up the socioeconomic ladder, and their demise is widening the income gap in America. In March 2010, President Barack Obama announced a goal of reversing the decline of goods-producing industries and doubling the value of American exports by 2015. Such an undertaking, which could create 2 million new American jobs, would also ideally prompt expansion of the freight rail system to move more goods, with the added benefit of creating jobs in the manufacture of the rolling stock and machinery requisite to grow the American rail network.

### Freight Rail Key to Manufacturing Jobs

#### High Multiplication Ratio Means That Plan Creates Millions of Jobs

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<http://www.buildingindiananews.com/BGA-Freight-Rail-Report-FINAL.pdf>, May

Rail investments tend to create quality employment opportunities. Re-spending — or induced — jobs will also be created in the industries in which workers in the direct and indirect industries choose to spend their additional income. This can include anything from housing, education, food, recreation and other consumer and business spending made possible through rail-derived income. Because we cannot predict what types of purchases workers will make, it would be inappropriate to label the entire job impact as consisting of “green jobs.” The model only predicts direct and indirect job impact, but by applying a standard economic multiplier one can determine a rough estimate of the total job impact, one that includes re-spending effects. Economic multipliers are estimated by looking at historical data and attempting to link a single policy change with their economic impact. As such, estimates produced by this modeling should be considered guides rather than direct measures since all other variables are held constant (in order to isolate the policy effect) and also compensate for the fact that most policy changes are themselves responses to economic conditions. For these reasons, multiplier estimates tend to vary widely. On the low end, Mark Zandi (chief economist at Moody’s Economy. com) estimates that each dollar of infrastructure investment produces 57 cents of induced output throughout the rest of the economy (with a total economic multiplier of 1.57). The Congressional Budget Office publishes a broad multiplier for “purchases of goods and services by the federal government,” which it uses to calculate the economic impact of infrastructure investments. This multiplier is a range, from 1 (no induced economic impact) to 2.5 ($1.50 of induced output for every dollar). On the higher end, the U.S. Department of Commerce’s RIMS II (Regional Input-output Modeling System) employment model estimates that the multiplier for freight rail capital investments specifically is 3.4. xxviii Applying these economic multipliers suggest freight rail capital investments would produce anywhere from 12,300 to 26,600 total jobs (direct, indirect, and induced) per billion dollars of investment.

### Freight Rail Infrastructure Leads to HSR

#### Freight Rail Infrastructure Capacity Investment is the Key to National Passenger Rail

Hamberger ‘8

STATEMENT OF EDWARD R. HAMBERGER PRESIDENT & CHIEF EXECUTIVE OFFICER ASSOCIATION OF AMERICAN RAILROADS BEFORE THE U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE SUBCOMMITTEE ON RAILROADS, PIPELINES, AND HAZARDOUS MATERIALS HEARING ON RAIL CAPACITY APRIL 23, 2008 Association of American Railroads 50 F Street NW Washington, DC 20001, <http://republicans.transportation.house.gov/Media/File/Testimony/Rail/04-23-08-Hamberger.pdf>

Our nation’s privately-owned freight railroads are successful partners with passenger railroads all across the country. Around 97 percent of the 22,000 miles over which Amtrak operates are owned by freight railroads, and hundreds of millions of commuter trips each year occur on commuter rail systems that operate at least partially over tracks or right-of-way owned by freight railroads. Freight railroads recognize the potential national benefits of a strong national passenger rail system. The key question is: under what circumstances can freight and passenger interests advance this worthy goal? As noted earlier, because of substantial and sustained traffic increases, U.S. freight railroads are moving more freight than ever before, and demand for freight rail service is projected to grow sharply in the years ahead. Passenger rail growth would come on top of growth in freight traffic. That’s why, going forward, capacity will likely be the single most important factor determining our ability to provide the high quality rail service that will be essential for both freight and passengers.

#### Plan Leads to HSR But Doesn’t Rely On It, Shielding for Politics and Solvency Deficits

Longman ‘9

Phillip Longman is a senior fellow at the New America Foundation. Back on Tracks

A nineteenth-century technology could be the solution to our twenty-first-century problems. <http://www.washingtonmonthly.com/features/2009/0901.longman.html#Byline>, Jan/Feb

Finally, the proposal has an additional political advantage: it doesn’t 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 Obama committed to as a candidate. But its success wouldn’t depend on persuading a single American to take the train instead flying or driving. Indeed, with its promise of making driving more enjoyable and less dangerous, the proposal bridges the divide between auto-hating, Euroland-loving enviros and those who see access to the open road as an American birthright. What could be more post-1960s? Mr. President, this is change we can believe in.

#### Freight Infrastructure Investment the Key Internal Link to HSR, Solves Congestation and Auto-Emissions.

Economic Policy Institute ‘10

The Economic Policy Institute (EPI), a non-profit, non-partisan think tank, was created in 1986 to broaden discussions about economic policy to include the needs of low- and middle-income workers. Full Speed Ahead: Creating Green Jobs Through Freight Rail Expansion,

<http://www.buildingindiananews.com/BGA-Freight-Rail-Report-FINAL.pdf>, May

Currently, the nation’s freight rail network is relatively uncongested. Traffic will grow as the national economy gains traction, however, and over the next three decades demand for freight rail is projected to nearly double. Freight rail hosts passenger rail on its trackage, meaning increased demand for freight rail could also disrupt passenger rail traffic. This would be especially unfortunate given that the passenger rail industry is increasing capital investment to deliver higher and high-speed rail service, bolstered by multi-billion dollar investments set forth in the American Recovery and Reinvestment Act and subsequent federal budgets. Lower passenger rail efficiency could lead to additional congestion on our highways and air corridors, and also undercut efforts to bring the American passenger rail system on par with the higher speed networks benefiting other advanced economies. Conversely, strengthening our freight rail networks through expansion would create new synergies by reducing cargo traffic among freight modes and allow freight rail to capitalize on the growing intermodal market, which transports more than 12 million intermodal (ship, train and truck-compatible) containers annually. Freight rail capital investment is almost exclusively funded through industry revenues. Overall, the freight rail industry has invested $460 billion in revenues back into capital needs and expansion since 1980. These investments have continued through the recent economic downturn; in 2008, Class I railroads (the seven major national freight railroads, and Amtrak, which own and operate the majority of U.S. rail track) spent more than $10 billion on capital improvements (to include $2.6 billion on rolling stock and equipment, and $7.9 billion on roadway and structures). However, an additional $1 to $2 billion of annual capital investment is estimated as necessary to keep pace with growing demand for shipping in the years to come. xii

### Rail Capacity Crunch Now

#### **Massive Capacity Demands Coming Now**

Allen et al 2008

(Sarah Allen, Kendra Kelson, Hayden Migl, Rodney Schmidt, David Shoemaker, and Heather Thompson, The Bush School of Government and Public Service, May 2008 "Current Trends and Future Challenges in the Freight Railroad Industry Balancing Private Industry Interests and the Public Welfare")

The demand for freight transportation overall and rail transportation, in particular, is expected to dramatically increase over the next 30 years. According to a 2006 GAO report, “Recent forecasts predict that the demand for freight and freight rail transportation will grow significantly in the future.” 102 The distribution of the increased demand across transportation modes is uncertain; although the trucking industry is expected to absorb a bulk of the increase, the rail industry is also expected to see upwards of a 67 percent increase in rail freight tonnage demand. The railroad industry is already a key part of the American economy, and it will play a major role in meeting the increase in demand for freight transportation. While railroads carry an impressive 40 percent of the nation’s freight today, the industry’s share of the freight transportation market is expected to grow. Organizations such as the Federal Highway Administration (FHWA) and American Association of State Highway and Transportation Officials (AASHTO) agree that future freight rail demand will increase drastically over the next few decades – a prediction that will invariably impact operating capacity, productivity, and profitability. Demand projections calculated by each of these agencies are included in Table 9.

#### **Rails Capacity Shortages Increasing Now**

AASHTO ‘7

American Association of State Highway and Transportation Officials, Revenue Sources To Fund Transportation needs PDF, <http://www.transportation1.org/tif4report/TIF4-1.pdf>, September

In 2003, [AASHTO’s Freight Rail Bottom Line Report](http://freight.transportation.org/doc/FreightRailReport.pdf) found that the rail industry today is stable, productive and competitive, earning enough profit to operate, but not enough to replenish infrastructure quickly or fund modernization. After years of downsizing, the railroads face a capacity shortage because the growth in rail freight demand has now outstripped what they can carry. This is especially true for rail intermodal freight which has been growing at 4.6 percent per year, and is forecast to grow 213 percent by 2035. This growth, of course, is contingent on the ability of the railroads to finance adequate additional track capacity. Another challenge is removing height clearance obstructions that prevent double-stack service, such as along the I-95 Corridor.

### Traffic Congestion IL to Economy

#### Traffic Congestion destroys economic growth-labor market and production of goods and services

Staley 12 (Samuel, ph.d in public administration focus on urban planning, “Traffic Congestion and the Economic Decline of Cities” 1/5/12 http://reason.org/news/show/traffic-congestion-and-the-economic Accessed: 7/1/12

And Rod King, the organizer of an advocacy group aiming to reduce London, England's speed limit to 20 miles per hour, says the "peripheral advantages" to slower cities include increased bicycling as roads become safer, less government spending since cities don't need to install speed bumps, and better air quality as less fuel is burned speeding between traffic lights. Add in lower fatality rates as cars travel more slowly and, King says, "putting on the brakes starts to look like a no-brainer."   The slow cities King and Doig are advocating are missing a critical element -- the economic repercussions of slowing people down. The time spent stuck in traffic or on a slower commute or journey is time not spent shopping, eating at home with family, playing or working.   Longer commutes limit the size, scope and depth of labor markets. Firms have less access to workers because workers generally don't look for jobs far from where they live. And it's well established among urban economists that workers will accept lower paying jobs in order to avoid too long of a commute.   This isn't just theory. Real-world data supports the negative economic impacts of rising traffic congestion. A study by economist Kent Hymel appeared in the Journal of Urban Economics which [linked traffic congestion to slower employment growth](http://www.economics.uci.edu/files/economics/docs/micro/f08/hymel.pdf). Hymel examined traffic congestion and employment growth in 85 metropolitan areas between 1990 and 2003 and found evidence of rising regional traffic congestion choking employment growth. For example, a 50 percent reduction in congestion could boost employment by 10 to 30 percent in America's top 10 most congested cities. For Los Angeles, the most congested city in the U.S. in several measures according to [the Texas Transportation Institute](http://tti.tamu.edu/documents/mobility-report-2011-wappx.pdf), a 10 percent increase in regional congestion reduced employment growth by 4 percent, according to Hymel's estimates. In short, Hymel writes, "congestion has a broad negative impact on economic growth."   In Gridlock and Growth, a 2009 study published by Reason Foundation and University of North Carolina at Charlotte, Professor David Hartgen found shortening travel times to include a larger labor market would add billions of dollars to regional output and income in cities including Seattle, San Francisco, Salt Lake City, Detroit, Dallas, Denver, and Charlotte. A 10 percent reduction in travel times could boost production of goods and services by 1 percent, leading to tens of billions of dollars in higher income and output for those cities, Hartgen found.   So, does this mean the congestion enthusiasts are simply wrong?   On a regional level, yes.   Traffic congestion's localized impacts, however, may not be quite as negative for certain types of neighborhoods. The key is understanding the difference between regional and localized congestion. And different strategies for disparate mobility problems may be necessary.   John Norquist, CEO of the Congress for New Urbanism, recommends that traffic analysts distinguish between "through traffic" and traffic intended for local destinations, citing a case in Milwaukee where city officials preserved several city blocks of retail business instead of widening the road to improve traffic circulation. On the block level, congestion may be a sign of economic success, but the congestion itself still inhibits mobility and circulation. Congestion still has a negative impact. The question is whether congestion can be reduced, or even eliminated, while also preserving the features of the block that make it economically successful. On the block level, eliminating congestion may not be practical or feasible.   But what is good for the block is not necessarily good for the region. Most transportation policymakers focus on regional congestion, not the relatively isolated nodes or places that many planners envision when they consider the supposed benefits of low circulation. Congestion relief is typically focused on improving traffic flows along miles of congested roadway and intersections such as the Kennedy Expressway and "Spaghetti Bowl" in Chicago, the I-10 and I-405 in Los Angeles, the LBJ (I-635) expressway in Dallas, or the I-395 beltway around Washington, D.C. These stretches of roadway contribute to regional congestion and capture the lion's share of the negative impact for cities.

In these cases, the research confirms that traffic congestion is an economic plague on America's urban areas and regions. Speeding up traffic is a key to sustainable regional economic growth. Policymakers shouldn't lose sight of this when creating jobs and keeping America's cities productive.

#### Congestion Costs increasing significantly costs gas & capital

TTI 11 (Texas transportation institute, largest transportation research agency in the U.S. , “2011 Urban Mobility Report”, September 2011, http://tti.tamu.edu/documents/mobility-report-2011-wappx.pdf Accessed:7/2/12

Congestion costs are increasing. The congestion “invoice” for the cost of extra time and fuel in 439 urban areas was (all values in constant 2010 dollars): In 2010 – $101 billion In 2000 –$79 billion In 1982 – $21 billion Congestion wastes a massive amount of time, fuel and money. In 2010: 1.9 billion gallons of wasted fuel (equivalent to about 2 months of flow in the Alaska Pipeline). 4.8 billion hours of extra time (equivalent to the time Americans spend relaxing and thinking in 10 weeks). $101 billion of delay and fuel cost (the negative effect of uncertain or longer delivery times, missed meetings, business relocations and other congestion-related effects are not included). $23 billion of the delay cost was the effect of congestion on truck operations; this does not include any value for the goods being transported in the trucks. The cost to the average commuter was $713 in 2010 compared to an inflation-adjusted $301 in 1982. Congestion affects people who make trips during the peak period. Yearly peak period delay for the average commuter was 34 hours in 2010, up from 14 hours in 1982. Those commuters wasted 14 gallons of fuel in the peak periods in 2010 – a week’s worth of fuel for the average U.S. driver – up from 6 gallons in 1982. Congestion effects were even larger in areas with over one million persons – 44 hours and 20 gallons in 2010. “Rush hour” – possibly the most misnamed period ever – lasted 6 hours in the largest areas in 2010. Fridays are the worst days to travel. The combination of work, school, leisure and other trips mean that urban residents earn their weekend after suffering 200 million more delay hours than Monday. 60 million Americans suffered more than 30 hours of delay in 2010. Congestion is also a problem at other hours. Approximately 40 percent of total delay occurs in the midday and overnight (outside of the peak hours of 6 to 10 a.m. and 3 to 7 p.m.) times of day when travelers and shippers expect free-flow travel. Many manufacturing processes depend on a free-flow trip for efficient production; it is difficult to achieve the most desirable outcome with a network that may be congested at any time of day. TTI’s 2011 Urban Mobility Report Powered by INRIX Traffic Data 5More Detail About Congestion Problems Congestion, by every measure, has increased substantially over the 29 years covered in this report. The recent decline in congestion brought on by the economic recession has been reversed in most urban regions. This is consistent with the pattern seen in some metropolitan regions in the 1980s and 1990s; economic recessions cause fewer goods to be purchased, job losses mean fewer people on the road in rush hours and tight family budgets mean different travel decisions are made. As the economy recovers, so does traffic congestion. In previous regional recessions, once employment began a sustained, significant growth period, congestion increased as well.

The total congestion problem in 2010 was approximately near the levels recorded in 2004; growth in the number of commuters means that the delay per commuter is less in 2010. This “reset” in the congestion trend, and the low prices for construction, should be used as a time to promote congestion reduction programs, policies and projects.

Congestion is worse in areas of every size – it is not just a big city problem. The growing delays also hit residents of smaller cities (Exhibit 3). Regions of all sizes have problems implementing enough projects, programs and policies to meet the demand of growing population and jobs. Major projects, programs and funding efforts take 10 to 15 years to develop.

#### Congestion problem will increase in the next ten years-by all measures

TTI 11 (Texas transportation institute, largest transportation research agency in the U.S. , “2011 Urban Mobility Report”, September 2011, http://tti.tamu.edu/documents/mobility-report-2011-wappx.pdf Accessed:7/2/12

As Yogi Berra said, “I don’t like to make predictions, especially about the future...” But with a few clearly stated assumptions, this report provides some estimates of the near-future congestion problem. Basically, these assumptions relate to the growth in travel and the amount of effort being made to accommodate that growth, as well as address the current congestion problem. In summary, the outlook is not sunshine and kittens. Population and employment growth—two primary factors in rush hour travel demand—are projected to grow slightly slower from 2010 to 2020 than in the previous ten years. The combined role of the government and private sector will yield approximately the same rate of transportation system expansion (both roadway and public transportation). (The analysis assumed that policies and funding levels will remain about the same). The growth in usage of any of the alternatives (biking, walking, work or shop at home) will continue at the same rate. Decisions as to the priorities and level of effort in solving transportation problems will continue as in the recent past. The period before the economic recession was used as the indicator of the effect of growth. The years from 2000 to 2006 had generally steady economic growth in most U.S. urban regions; these years are assumed to be a good indicator of the future level of investment in solutions and the resulting increase in congestion. If this “status quo” benchmark is applied to the next five to ten years, a rough estimate of future congestion can be developed. The congestion estimate for any single region will be affected by the funding, project selections and operational strategies; the simplified estimation procedure used in this report will not capture these variations. Combining all the regions into one value for each population group, however, may result in a balance between estimates that are too high and those that are too low. The national congestion cost will grow from $101 billion to $133 billion in 2015 and $175 billion in 2020 (in 2010 dollars). Delay will grow to 6.1 billion hours in 2015 and 7.7 billion hours in 2020. The average commuter will see their cost grow to $937 in 2015 and $1,232 in 2020 (in 2010 dollars). They will waste 37 hours and 16 gallons in 2015 and 41 hours and 19 gallons in 2020. Wasted fuel will increase to 2.5 billion gallons in 2015 and 3.2 billion gallons in 2020. If the price of gasoline grows to $5 per gallon, the congestion-related fuel cost would grow to $13 billion in 2015 and $16 billion in 2020.

#### Your Cities arguments are incorrect-city economies are the biggest despite congestion

Dumbaugh 12 (Eric, professor of urban planning, “Rethinking the economics of Traffic Conmgestion”, 6/1/12, http://www.theatlanticcities.com/commute/2012/06/defense-congestion/2118/ Accessed: 7/2/12

While behavioral adaptations and changes in consumer preferences have already begun to address the issue of personal transportation in congested environments, a second issue remains unanswered: how do congested areas deal with freight and goods movement? A common argument is that if a region’s roadways are congested, goods will be unable to get to market and its economy will falter. Yet even the most casual glance at our most congested regions - New York, Los Angeles, and San Francisco to name three - quickly dispels this idea. These are not places where consumer choices are limited, nor are they areas with stagnant economies. Quite the contrary. They are precisely the areas where one finds not only the most vibrant economies, but also the greatest variety of goods and services. How is this possible? It is important to recognize that major manufacturing and freight activities rarely occur in congested city centers, where land values are too high to make these activities economically viable. Likewise, long-haul truck drivers, who are paid on a per-mile travelled basis, have a powerful economic incentive to avoid traveling through urban areas during congested time periods, which reduces the number of miles per hour they can travel, and thus the number of dollars per hour they receive for their time. Urban economies naturally encourage these activities to move away from congested areas and time periods. It is nevertheless true that goods movement is growing in the United States, making it a transportation issue that cannot be dismissed lightly. Should a region discover that it needs additional capacity for freight traffic, plenty of capacity can be found by converting a “free” highway lane into a truck-only toll lane, which not only allocates highway capacity for goods movement, but which also generates the revenues needed to pay for the highway’s maintenance. Given that highway infrastructure in the United States is aging and in growing need of repair, and that the ongoing decline of federal gas tax revenues has made it difficult for many state and local governments to fund basic highway maintenance, such solutions are likely to look increasingly attractive in the future. Within cities themselves, the relevant issue is neither manufacturing nor long-haul transport, but the movement of goods destined for local markets. This is currently addressed through a variety of strategies, including the scheduling of deliveries to off-peak periods and the use of bicycle couriers in highly-congested areas. It has also led to the development of more technologically-sophisticated solutions, such as the use of GPS-based fleet management systems that permit dynamic trip scheduling and routing, allowing drivers to bypass localized pockets of traffic congestion. This is a growth industry that is projected to generate more than $9 billion in [annual revenues by 2015](http://www.abiresearch.com/press/1638-Fleet%2BManagement%2BSystem%2BMarket%2BStays%2BFlat%2Bin%2Bthe%2BShort%2BTerm%2C%2Bbut%2BWill%2BRebound%2BBeginning%2Bin%2B2012). As Jane Jacobs has observed, city economies generate the resources needed to solve city problems. None of this is to suggest that there is no benefit in having our transportation system operate efficiently. But automobile congestion, vehicle delay, and their proxy, level-of-service, are not measures of system efficiency. Nor are they measures of economic vitality. They are nothing more or less than measures of how convenient it is to drive an automobile.

#### People lose 69 billion dollars a year while stuck in traffic

Cambridge Systematics 2 (MIT professor run firm, “The Benefits of Reducing Congestion”, January 2002 http://www.transportation.org/sites/planning/docs/nchrp22\_4.pdf Accessed: 7/2/12

The value of time lost to congestion. The costs of congestion go beyond increased stress and disruption to peoples’ daily schedules. The time that people lose in congestion has a monetary value. For motorists driving to work or on business, the opportunity cost includes the work time that may be lost due to delays in the daily commute.

The value of extra time spent in travel is usually estimated by multiplying the number of hours lost by some fraction of the gross hourly wage, which includes workers’ compensation and other fringe benefits paid by the employer. This average value has most recently been estimated at $12.40 per hour, in 1999 dollars. Considering the hours lost to congestion annually in the 68 largest U.S. metropolitan areas, the total cost of lost time is estimated at $69 billion nationwide.10

#### Congestion increases highway crashes and fuel consumption

Cambridge Systematics 2 (MIT professor run firm, “The Benefits of Reducing Congestion”, January 2002 http://www.transportation.org/sites/planning/docs/nchrp22\_4.pdf Accessed: 7/2/12

Crashes. Traffic congestion contributes to highway crashes. As highway crowding increases and motorists jockey for position at exits and entryways, the potential for crashes increases (Figure 2). While accidents are more likely to be fatal at higher speeds, fixing bottlenecks can nevertheless reduce the number of all types of crashes, thereby saving lives and preventing injuries. A study prepared for the American Highway Users Alliance estimated that improvements to the 166 most serious bottlenecks nationwide would pre- vent 287,200 crashes over a 20-year period, including 1,150 fatalities and 141,000 injuries.11 Increased crash costs also affect business costs such as insurance, driver replacement, and workers’ compensation. Vehicle operating costs and fuel consumption. The cost of gasoline and other operating and maintenance requirements attributable to congestion can also be relatively high. Fluctuating speeds resulting from congestion can add considerably to vehicle operating costs, to the point where a “stop-and-go” speed of 30 mph can result in higher costs than an average ‘steady’ 50 mph.12 Researchers at the Texas Transportation Institute estimated that 6.8 billion gallons of fuel are wasted each year because of metropolitan congestion. When dollar values are assigned to the value of excess fuel consumed, the cost is estimated to be $9 billion annually.

#### Highway congestion causes bad air quality and reduces Hydrocarbon and Nitrogen emissions

Cambridge Systematics 2 (MIT professor run firm, “The Benefits of Reducing Congestion”, January 2002 http://www.transportation.org/sites/planning/docs/nchrp22\_4.pdf Accessed: 7/2/12

Emissions and air quality. Efforts to reduce congestion can have a positive effect on air quality. Idling, low-speed travel, and especially hard acceleration – which characterize congested conditions – all result in higher emissions than does travel at consistent, moderate speeds. Strategies to reduce congestion, including coordinating traffic signals, expanding intersection capacity, and responding to incidents more quickly, therefore can help to reduce emissions from motor vehicles. Recent research to update the U.S. Environmental Protection Agency’s MOBILE emission factor model has produced new “speed correction factors” that show how emissions vary according to the level of congestion on highways and arterial roads. These factors suggest that the greatest emission reduction benefits come from reducing extreme congestion and smoothing traffic flow on arterials. Increasing average arterial speeds from 10 to 20 mph, for example, reduces hydrocarbon (HC) emissions by roughly 40 percent and emissions of oxides of nitrogen (NOx) by roughly 20 percent. Under most conditions, emissions continue to decline until 30 to 40 mph, although they increase somewhat as average speeds approach 50 to 60 mph or more. When the EZ-Pass toll collection system was introduced on the New Jersey Turnpike in 2000, emissions of VOC and NOx on a typical weekday declined by 0.35 tons and 0.056 tons, respectively, as a result of reduced queuing and increased speeds. In addition, toll plaza delays were shortened by 85 percent and fuel consumption reduced by 1.2 million gallons annually.14 Research has also shown that emissions are sharply higher under conditions of hard acceleration and deceleration.15 As a result, measures that smooth traffic flow, reducing starts, stops, and hard accelerations, can have disproportionate benefits for emission reduction.

### Rail Congestion Collapses Economy

#### Lack of Federal Infrastructure Investment is Causing Railroad congestion and collapses US transcontinental shipping and trade credibility

Gallagher ‘5

(Traffic World March 14, 2005, Monday SECTION: RAIL; Pg. WPLENGTH: 1530 words HEADLINE: Derailing the Economy BYLINE: JOHN GALLAGHER - ASSOCIATE EDITOR)

Rail service shortfalls, high rates are hindering shippers' ability to expand reach, scope of products, businesses. The inability of the North American rail system to meet the demands of a growing number of customers is nearing a critical point, threatening to put the brakes on an economic engine hungry for more fuel and limit growth. With rail capacity stretched to never-before-seen limits, shippers across the United States and Canada said in a series of interviews that rail service shortfalls are having an unprecedented impact on their planning and their ability to meet their business forecasts. They are increasingly frustrated, they said, by the lack of rail cars to ship their products and rate hikes and accessorial charges they say are accelerating out of control. Captive rail shippers are especially hindered by the lack of transportation service, to the point where some are throttling back production and delaying expansion plans. When combined with congestion in nearly all segments of the supply chain, it's only a matter of time, some say, before consumers feel the effects at the checkout counter. "Transportation as a whole is under a lot of stress right now, and additional money from Congress to address infrastructure issues is not forthcoming," said Erik Autor, vice president and international trade counsel for the National Retail Federation. "It's affecting anyone involved in transportation, beyond imports and exports, but domestically as well. The system is really starting to crumble, and it's eventually going to find a way into consumer prices." The issue is percolating even within the federal government, which is more accustomed to tracking general trends than keeping tabs on short-term events. Maritime congestion is "masking congestion on the rails and roads," raising costs for shippers and consumers, Jeffrey Shane, undersecretary for policy at the Department of Transportation, told a recent American Association of State Highway and Transportation Officials legislative conference. As the heavy-lifter for both international and domestic trade, the North American rail system may be under the most stress. Railroads hit record volume levels last year, up almost 5 percent from 2003, driven largely by waves of imports that show no signs of subsiding in 2005. But even as the railroads have been hustling to keep up with demand on the intermodal side, domestic carload shippers are struggling to keep inventory moving through the supply chain. "It's an aggravation, and it has hindered us from initiatives designed to improve service and ship more rail," said Howard Bacon, director of transportation and global supply chain for $26 billion International Paper.

#### Railroad congestion makes shipping impossible and collapses global trade- destroys the economy

AAR ‘4

 (Association of American Railroads) July 2004. [“Overview of US Freight Railroads” National Atlas. <http://nationalatlas.gov/articles/transportation/a_freightrr.html>]

Freight railroads are critical to the economic well-being and global competitiveness of the United States. They move 42 percent of our nation's freight (measured in ton-miles) - everything from lumber to vegetables, coal to orange juice, grain to automobiles, and chemicals to scrap iron - and connect businesses with each other across the country and with markets overseas. They also contribute billions of dollars each year to the economy through investments, wages, purchases, and taxes. Class I railroads are those with operating revenue of at least $272 million in 2002. Class I carriers comprise only 1 percent of the number of U.S. freight railroads, but they account for 70 percent of the industry's mileage operated, 89 percent of its employees, and 92 percent of its freight revenue. Class I carriers typically operate in many different states and concentrate largely (though not exclusively) on long-haul, high-density intercity traffic lanes. There are seven Class I railroads <note 1 see below> ranging in size from just over 3,000 to more than 33,000 miles operated and from 2,600 to more than 46,000 employees.

### Capacity Key to the Economy

#### Capacity Increase Boosts Economy--$1 trillion over 30 years

Allen et al 2008

(Sarah Allen, Kendra Kelson, Hayden Migl, Rodney Schmidt, David Shoemaker, and Heather Thompson, The Bush School of Government and Public Service, May 2008 "Current Trends and Future Challenges in the Freight Railroad Industry Balancing Private Industry Interests and the Public Welfare")

While freight rail capacity is a complex subject, the need for more freight transportation capacity is clear. An AAR‐commissioned study by Cambridge Systematics estimated that over the next 28 years, $148 billion dollars must be invested in additional capacity. Without this investment, an estimated 30 percent of the nation’s rail system will be over capacity by 2035. 117 The trucking industry faces similar capacity development constraints. AASHTO reports that many state highway departments face long‐term funding shortfalls, making continued highway expansion less likely. This means that the rail industry must absorb demand the highway system cannot accommodate. AASHTO noted that if all traffic currently shipped by rail went by truck instead, it would add 92 billion truck vehicle miles of travel (VMT) and cost an additional $64 billion over the next 20 years. 118 If current rail capacity remains constant, 31 billion VMT will be added to the highways at a total cost to society in excess of $800 billion over the next 20 years. In their report, AASHTO presented an “aggressive scenario” for capacity investment that would allow railroads to increase their share of total tonnage by 1 percent and move 600 million tons of freight off of the highways, costing $205‐225 billion dollars over the next 20 years. The savings to society calculated by AASHTO under this plan could exceed $1 trillion. 119 Faced with rising demand for rail freight transportation and an overall tightening of domestic capacity, railroads have ample incentive to increase capacity.

### Rail Infrastructure Key to Every Sector of Economy

#### Railroad Infrastructure Investment Necessary Internal Link to Every Sector of the Economy

Hamberger ‘8

STATEMENT OF EDWARD R. HAMBERGER PRESIDENT & CHIEF EXECUTIVE OFFICER ASSOCIATION OF AMERICAN RAILROADS BEFORE THE U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE SUBCOMMITTEE ON RAILROADS, PIPELINES, AND HAZARDOUS MATERIALS HEARING ON RAIL CAPACITY APRIL 23, 2008 Association of American Railroads 50 F Street NW Washington, DC 20001, <http://republicans.transportation.house.gov/Media/File/Testimony/Rail/04-23-08-Hamberger.pdf>

Comprehensive, reliable, and cost-effective freight railroad service is critical to our nation. Today, freight railroads serve nearly every industrial, wholesale, retail, agricultural, and mineral-based sector of our economy. And in the words of the former Railways Adviser at the World Bank, “Because of a market-based approach involving minimal government intervention, today’s U.S. freight railroads add up to a network that, comparing the total cost to shippers and taxpayers, gives the world’s most cost-effective rail freight service.” Looking ahead, the United States cannot prosper in an increasingly-competitive global marketplace if our freight railroads are unable to meet our growing transportation needs. Having adequate rail capacity is critical to meeting those needs. Railroads must be able to both maintain their extensive existing infrastructure and equipment and build the substantial new capacity that will be required to transport the significant additional traffic our economy will generate. I respectfully suggest that members of this committee, your colleagues in Congress, and other policymakers have critical roles to play. Indeed, a primary obligation of policymakers is to take steps that assist — and, just as importantly, not take steps that hinder — railroads in making the investments needed to provide the current and future freight transportation capacity our nation requires.

### Rail Transition Solves Gridlock: Economy

#### Freight Rail Expansion Solves Highway Gridlock, Boosts Economy

AAR ‘11

Association of American Railroads. The Economic Impact of America’s Freight Railroads, <http://www.aar.org/~/media/aar/Background-Papers/The-Economic-Impact-of-Freight.ashx>, Octoboer

Highway Congestion – Highway gridlock costs the U.S. economy $101 billion per year

— and that’s just in wasted fuel and time. Lost productivity, cargo delays, and other costs

add tens of billions of dollars to this tab. But a train can carry the freight of several

hundred trucks. That means railroads reduce highway gridlock, the costs of maintaining

existing highways, and the pressure to build costly new highways. That’s especially

important now when government funding for highway spending and other purposes is

under such severe pressure.

### PPP Key to Solve

#### **Railroad Infrastructure Stalled for Lack of Capital and Risk—PPP Solve Risk and Free Up Projects**

Allen et al 2008

(Sarah Allen, Kendra Kelson, Hayden Migl, Rodney Schmidt, David Shoemaker, and Heather Thompson, The Bush School of Government and Public Service, May 2008 "Current Trends and Future Challenges in the Freight Railroad Industry Balancing Private Industry Interests and the Public Welfare")

Increasing capacity is not a simple process. It can be costly and slow, which makes it difficult for railroads to adjust quickly to changes in demand for freight transportation. An example of a typical capacity project on many railroads is adding an additional siding on a single track route. According to Norfolk Southern executive James McClellan, such a siding can cost in excess of $10 million. Because capacity expansion projects are costly, railroads are highly selective in pursuing capital improvements. Cost is not the only factor railroads consider. For example, there are a limited number of suppliers of rolling stock. As a result, cars and locomotives must be ordered well in advance. Additionally, there are environmental and quality of life factors that must be considered that often slow down the construction of additional infrastructure. Local residents may be opposed to additional traffic on a nearby rail line if it increases levels of noise and vibration, and environmental rules may prohibit construction in the most advantageous locations. In effect, rail carriers spend considerable time planning major improvements to the fixed physical plant. One response to the capacity crunch has been the use of public funds to finance capacity improvements through public‐private partnerships (PPPs). The principal goal of PPPs is to increase capacity in a particular corridor by adding infrastructure. By reducing a railroad company’s cost of capital, public sector financing effectively increases the likelihood of capital investments and capacity expansion. The Alameda Corridor in Los Angeles is a well‐known PPP that combined several rail lines into one, grade‐separated route. Other PPPs are being considered in Virginia and Chicago. Despite the popularity of PPPs, the trend has been hampered by the difficulty of achieving an equitable division of costs and benefits between the public and private sector. The lack of a standardized methodology and perhaps more significantly, the difficulty of putting a price on intangible benefits have been key barriers to pursuing PPPs.

Public-Private Partnerships Key to Boost Rail Capacity
AAR ‘12

Association of American Railroads. America Needs More Rail Capacity. <http://www.aar.org/~/media/aar/Background-Papers/America-Needs-More-Capacity.ashx>, June

In the years ahead, America’s demand for safe, affordable, and environmentally responsible freight transportation will grow. Railroads are the best way to meet this demand. Overwhelmingly private owned and operated, in recent years railroads have been reinvesting more than $20 billion per year — of their own funds, not government funds — to create a freight rail network that is second to none in the world. Public officials can help ensure that America has adequate rail capacity in the years ahead by retaining the current rail regulatory structure that protects shippers and consumers while giving railroads the opportunity to earn the funds they need to keep their networks in top condition; by reforming the corporate tax code to enhance economic development and promote job growth; and by entering into mutually beneficial public-private partnerships with railroads to solve transportation problems.

#### **PPPs Key to Solve Railway Projects—Government Must Absorb Projects**

Estache et al. ‘7

Antonio Estache Université Libre de Bruxelles (ULB) - European Center for Advanced Research in Economics and Statistics, Ellis Juan World Bank, Lourdes Trujillo-Castellano Departamento de Analisis Economico Aplicado, Universidad de Las Palmas de Gran Canaria, University College of London (UCL) Estache, Antonio, Juan, Ellis and Trujillo, Lourdes, Public-Private Partnerships in Transport (December 1, 2007). World Bank Policy Research Working Paper Series, Vol. , pp. -, 2007. Available at SSRN: http://ssrn.com/abstract=1072402

Successful PPPs have been characterized by a broad level of risk-sharing between

the public and private sectors. Generally, the private sector is better at managing

commercial risks and responsibilities such as those associated with construction, operation,

and financing. In contrast, transport projects most likely depend on public participation in

areas such as acquisition of right-of-way, political risk, and in some cases, traffic and

revenue risk. PPPs has worked best when experienced, well-capitalized firms have enough

discretion over design and confidence in pricing policy to accept construction and some

degree of traffic risk, while the government assumes the risks that it controls and gives

consideration to financial support or guarantees if traffic levels in the early years are

insufficient.

#### Private-Public Cooperation on rail is key to growth

Bryan et al 2006

(Joseph Bryan, Global Insight, Inc. Glen Weisbrod, Economic Development Research Group Carl D. Martland, Senior Research Associate, M.I.T., October 2006, "GUIDEBOOK FOR ASSESSING RAIL FREIGHT SOLUTIONS TO ROADWAY CONGESTION" http://www.edrgroup.com/pdf/nchrp08-42\_guidebook\_rev10-06.pdf)

Partnerships in rail are appropriate, realistic, and increasingly valuable for the two parties. Rail will not stop road congestion, but it can blunt it. Rail is not always a remedy for freight capacity, but in fitting conditions it is competitive and effective. Public money is not the whole answer for railroad growth, but it is part of the answer in an era when needs and opportunities are ripe. The questions of when rail partnerships are useful, of evaluating and making the case for them, and of treating barriers to rail effectiveness are some of the matters for which this book is a guide. To the basic questions of whether the public should look to the private rail system for capacity, and whether that can work, the response should be yes. If public investment in private infrastructure produces a public benefit, making the investment ought to be a straightforward proposition. There are institutional obstacles at many levels of government, but there are solutions as well, just as solutions have been found for roadway partnerships. When public funds moderate the capital intensity of railroading, new services become possible at a lower cost. When the new services are competitive with highway transport – as many can be – their cost position creates a persuasive advantage and rail wins traffic. In short, good service at a lower cost wins freight business, public funds used with discrimination can help that to happen on rail, public benefits can result and railroads can grow.

#### PPPs Solve—Hold Down Spending, Target Money, and Solve Oil Dependence and Emissions

McCulloch ‘10

Rob McCulloch is Senior Policy and Legislative Advocate, BlueGreen Alliance. Grow the rail network through incentives. Grow the Rail Network Through Incentives.. http://transportation.nationaljournal.com/2010/10/talkin-about-a-railvolution.php , OCTOBER 15, 2010 In addition to tax credits, public-private partnerships can greatly expand rail investment with responsibility shared between two entities - government paying only for public benefits, and railroads paying for the business benefits they gain from improvements to the rail network. For example, some projects might deliver public benefits such as decreasing highway congestion by taking trucks off the road, or foster higher and high-speed intercity passenger rail (increasing travel options and contributing to a lower carbon transportation system), as well as private benefits for passenger and freight rail by enabling faster, more reliable train operations. Accountability should ensure public financing is tied to public benefit outcomes, which includes creating quality American jobs. In order to maximize the economic benefit of these investments, taxpayer funding for freight rail investment should attach prevailing wage provisions to ensure new jobs maintain the rail industry’s relatively high level of pay, and expand these benefits to more workers. Policy should also incorporate domestic sourcing (“Buy America”) requirements to ensure these capital infusions benefit American workers, expand domestic clean energy manufacturing, and amplify multiplier effects for both employment and investment within the U.S. economy. Rail’s potential to move passengers, deliver freight efficiently, create quality employment and reduce oil dependence and pollution is well established. Expanding capacity would move us towards the balanced, multi-modal, 21st century transportation network America needs move to a truly sustainable, clean energy economy. And it won’t break the bank.

#### High-speed rails require a public-private cooperation to work

Angie Schmitt, a newspaper reporter who joined Streetsblog in 2009, Wednesday, July 20, 2011

<http://dc.streetsblog.org/2011/07/20/the-public-interest-and-private-sector-involvement-in-high-speed-rail/>

The issue of privatization of public infrastructure was polarizing enough before the recent House proposal to take the Northeast Corridor away from Amtrak and turn it over to private firms. The privatization plan has its champions, who say it’s the only way to save high-speed rail, and its detractors, who call it a death knell for even the rail service we currently have. High-speed rail makes for complicated infrastructure projects. Government entities must be diligent to ensure that private sector partnerships do not subvert the project's aims. In the middle are those who acknowledge that high-speed rail can’t be built in this country without some private funds, but that the government should still carefully control the process. A new report from the U.S. Public Interest Research Group, released yesterday, walks that center line. Better yet, it gives examples from around the world of how privatization has worked — and how it hasn’t. And it maintains that the question is not so much whether or not to involve the private sector, but how to craft the terms of the agreement so that the partnership adds value — not increased risk — for the taxpayer. “Private financing can be a supplement but not a substitute for public support of high-speed rail,” said Phineas Baxandall of U.S. PIRG. Indeed, it is clear that public and private actors are going to have to cooperate in order for the U.S. to realize its high-speed rail ambitions in California and elsewhere.

#### Public Private Partnerships key to successful infrastructure development

Young Hoon Kwak, Associate Professor of Project Management [Department of Decision Sciences](http://business.gwu.edu/decisionsciences/) [School of Business](http://business.gwu.edu/), YingYi Chih, lecturer at the Research School of Management ANU College of Business and Economics, C. William Ibbs, professor at the Department of Civil and Environmental Engineering University of California, Winter 2009. [“Towards a Comprehensive Understanding of Public Private Partnerships for Infrastructure Development”] <http://home.gwu.edu/~kwak/Infra_PPP_Kwak_Chih_Ibbs.pdf>

Public Private Partnerships (PPPs) have emerged as one of the major approaches for delivering infrastructure projects in recent years. If properly formulated and managed, a PPP can provide a number of beneﬁts to the public sector such as: alleviating the ﬁnancial burden on the public sector due to rising infrastructure development costs; allowing risks to be transferred from the public to the private sector; and increasing the “value for money” spent for infrastructure services by providing more efﬁcient, lower cost, and reliable services. 1 However, the experience of the public sector with PPPs has not always been positive. Many PPP projects are either held up or terminated due to: wide gaps between public and private sector expectations; lack of clear government objectives and commitment; complex decision making; poorly deﬁned sector policies; inadequate legal/regulatory frameworks; poor risk management; low credibility of government policies; inadequate domestic capital markets; lack of mechanisms to attract long-term ﬁnance from private sources at affordable rates; poor transparency; and lack of competition. 2 Despite numerous negative experiences, 3 many governments (e.g., the UK and Australia) continue to view PPPs as one of the key strategies for delivering public services and infrastructure. Therefore, understanding and enhancing knowledge of PPPs continue to be a matter of signiﬁcance and importance. During the past decades, researchers have conducted studies that cover a wide range of topics, such as how to select an appropriate concessionaire, what are the critical factors for the success or failure of PPP projects, what roles the government should play in PPP projects, and more.

### PPPs Solve Economy/Emissions

#### PPPs Key to Boost Rail Infrastructure, Solves Economy and Emissions

Carper ‘8

Tom Carper (D-Del.) is a member of the Senate Commerce, Science and Transportation Committee. Fuel-efficient freight rail deserves more federal support, THE HILL, <http://www.nationalgateway.org/fuel-efficient-freight-rail-deserves-more-federal-support>, August 11.

Today, across the country, policymakers, industry and consumers alike are all looking for more affordable ways to move people and goods. Consider this: America's railroads can move one ton of freight roughly the distance between Washington, D.C., and Boston on just one gallon of diesel fuel. That's pretty amazing energy savings in this time of gas prices topping $4 a gallon and airlines slashing schedules. It's time we take full advantage of more fuel-efficient forms of transportation and start to think beyond just our highways and airways. Rail has always been an efficient form of transport, and our nation's railroads continue to make improvements. Today, our trains are 3.1 percent more efficient than they were last year and a whopping 85 percent more efficient than they were in 1980. Think of how much better off our country would be if all energy users had improved their efficiency by 85 percent since 1980. And while much has been said recently about more Americans riding Amtrak and our nation's other passenger rails, that is just one half of the track, so to speak. I'm convinced that robust freight rail service is one of the keys to a sustainable future for our country and our planet. While trucks will remain a vital component in our nation's transportation system for a long time to come, freight trains help Americans beat congestion by reducing the number of trucks on our roads and saving drivers time, money and fuel costs. For example, one single intermodal train takes some 280 trucks off the road. And, being so fuel-efficient, freight railroads emit fewer greenhouse gases than cars and trucks. In fact, the Environmental Protection Agency says freight trains emit only one-third the greenhouse gases emitted by trucks. This means that for every ton-mile of freight that moves by rail and not on highways, greenhouse gas emissions are reduced by two-thirds. The efficiency of rail also means fewer emissions of nitrogen oxide and other particulate matter. But if freight and passenger rail are to play a bigger role in our nation's future, we must invest in rail infrastructure to keep up with that expanded role. Already some of our county's rail corridors are congested, and freight traffic continues to grow. According to a study completed last year by Cambridge Systematics, unless capacity is increased, at least one-third of the nation's main rail corridors will be congested by 2035. Freight railroads are reinvesting large amounts of their own funds into America's rail systems, but that will not be enough funding to take full advantage of railroads' potential to meet our transportation needs. We in the government must do a better job of addressing our nation's aging rail infrastructure. Recent congressional proposals have included providing a tax credit for projects that expand freight rail capacity or encouraging more public-private partnerships for freight railroad infrastructure projects. Public-private funding partnerships reflect the fact that cooperation among the railroads and government is far more likely to result in timely, meaningful solutions to transportation problems than a go-it-alone approach. Yet another option is to ensure that federal climate change legislation directs a portion of funding generated by the sale of emissions credits to rail infrastructure. With today's high energy prices and greater attention focused on climate change, we cannot continue to wait to enhance freight rail capacity. Next year, when Congress considers legislation to reauthorize the surface transportation program, fight climate change and address high gas prices, it will be vitally important that lawmakers remember the key role that transit, passenger rail and freight rail play in reducing our nation's reliance on foreign oil, while cutting harmful emissions and getting people and goods where they need to go. Carper is a member of the Senate Commerce, Science and Transportation Committee.

### Rail Key to the Economy

#### **Freight Railroads Key to Econ**

AAR 2008

Association of American Railroads, Overview of the America’s Freight Railroads, PDF, <http://www.aar.org/PubCommon/Documents/AboutTheIndustry/Overview.pdf>, May

Freight railroads are critical to America’s economic health and global competitiveness. They move more than 40 percent of our nation’s freight (measured in ton-miles) — everything from lumber to vegetables, coal to orange juice, grain to automobiles, and chemicals to scrap iron — and connect businesses with each other across the country and with markets overseas. They also directly contribute tens of billions of dollars each year to the economy through wages, purchases, retirement benefits, and taxes. In 2006, the 561 freight railroads operating in the United States had aggregate freight revenue of $54 billion.

### Now Key Time

#### Now is the Key Time—Course Set for Economic Future Being Set Now

Longman ‘9

Phillip Longman is a senior fellow at the New America Foundation. Back on Tracks

A nineteenth-century technology could be the solution to our twenty-first-century problems. <http://www.washingtonmonthly.com/features/2009/0901.longman.html#Byline>, Jan/Feb

Yet despite this astounding potential, virtually no one in Washington is talking about investing any of that $1 trillion in freight rail capacity. Instead, almost all the talk out of the Obama camp and Congress has been about spending for roads and highway bridges, projects made necessary in large measure by America’s overreliance on pavement-smashing, traffic-snarling, fossil-fuel-guzzling trucks for the bulk of its domestic freight transport. This could be an epic mistake. Just as the Interstate Highway System changed, for better and for worse, the economy and the landscape of America, so too will the investment decisions Washington is about to make. The choice of infrastructure projects is de facto industrial policy; it’s 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, however, we need to look first at the past.report adds.

### Plan is Modelled Globally

#### US transportation policy is modeled globally- reduction in highway subsidies key to solve warming

Burwell ‘8, David for the Funders’ Network for Smart Growth and Livable Communities. January, The Role of US Transportation Policy Reform in Global Climate Protection, online 2009

U.S. leadership is required to win the climate fight. What the U.S, says and does still matters in the world—enormously. The U.S. transportation sector is largest and fastest-growing domestic, end-use source of carbon emissions (33%). This is due in large part to massive public subsidies to transportation (including the externalization of environmental costs) generally, and to highway travel in particular. These subsidies remain the basis of our national transportation policies. We are now exporting these policies to developing countries—just as the folly of reliance on such policies is becoming self-evident. If the US can’t reduce its own transportation carbon emissions when car ownership has reached the saturation point (857 vehicles/1000 population) why should China (at 15 vehicles/1000 on the way to 100 vehicles/1000 by 2020) be expected to do so when the country is still in the early stages of motorization?

#### Transportation policy is modeled globally and is the most important internal link for solving developing nation climate change- policy change is key

Sperling and Salon ‘2,

 ed., Transportation in Developing Countries: An Overview of Greenhouse Gas Reductions Strategies, Pew Center for Global Climate Change, online 2009

The importance of institutional reform (regional planning) and compact development is even more important in countries with immature transportation systems, far exceeding the benefits of technology and alternative fuels, including hydrogen fuel-cell commercialization. According to a recent study by the Pew Center for Global Climate Change, “(transportation) technologies that work in developed countries may not work in developing countries due to their expense, maintenance needs, fuel availability, or need for high levels of institutional support.”[[21]](http://www.transact.org/library/factsheets/climate.asp%22%20%5Cl%20%22_ftn21%22%20%5Co%20%22) The report goes on to state “other types of initiatives, not based on technology, are potentially more significant (for greenhouse gas reduction). The authors conclude, based on the four case studies prepared as part of this series of reports on transportation in developing countries, that initiatives based on institutional reform are more likely to revolutionize transportation. An enhanced level of coordination between transportation agencies and governments with land use control could lead to dramatic improvements in transportation efficiency and reductions in vehicle usage in ways that have rarely been seen in the past.”[[22]](http://www.transact.org/library/factsheets/climate.asp%22%20%5Cl%20%22_ftn22%22%20%5Co%20%22) Despite this conclusion, U.S. international transportation policy is largely based on exporting highway planning processes and road technologies to other countries. U.S. export credits largely support new highway construction as a way to promote U.S. business interests, not sustainable transportation systems. No known U.S.-funded program promotes integrated transportation and land use planning, or institutional reform, as an element of our international transportation assistance programs.

### Freight Railroad Solves: Laundry List

#### Federal Railroad Infrastructure Project Solves Oil Dependence, Emissions, Highway Gridlock and Particulate Pollution—Federal Action Key Because No Private Investment

Hamberger ‘8

STATEMENT OF EDWARD R. HAMBERGER PRESIDENT & CHIEF EXECUTIVE OFFICER ASSOCIATION OF AMERICAN RAILROADS BEFORE THE U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE SUBCOMMITTEE ON RAILROADS, PIPELINES, AND HAZARDOUS MATERIALS HEARING ON RAIL CAPACITY APRIL 23, 2008 Association of American Railroads 50 F Street NW Washington, DC 20001, <http://republicans.transportation.house.gov/Media/File/Testimony/Rail/04-23-08-Hamberger.pdf>

Public investment in freight rail infrastructure projects is justified because the extensive benefits that would accrue to the general public by increasing the use of freight rail would far exceed the costs of public participation. For example: • Fuel efficiency – Railroads are three or more times more fuel efficient than trucks. In 2007, railroads moved a ton of freight an average of more than 430 miles per gallon of fuel. If just 10 percent of the long distance freight that moves by highway moved by rail instead, fuel savings would exceed one billion gallons per year. • Greenhouse Gas Emissions – Greater use of freight rail offers a simple, inexpensive, and immediate way to meaningfully reduce greenhouse gas emissions without harming the economy. Because of railroads’ fuel efficiency, every ton-mile of freight that moves by rail instead of trucks reduces greenhouse gas emissions by two-thirds or more. • Highway congestion – Highway gridlock already costs the U.S. economy more than $78 billion per year just in wasted fuel and time, according to a study by the Texas Transportation Institute. But because a typical train takes the freight of several hundred trucks off our highways, freight railroads reduce highway gridlock, the costs of maintaining existing highways, and the pressure to build costly new highways. • Pollution – The EPA estimates that for every ton-mile of freight carried, a train typically emits substantially less nitrogen oxides and particulates than a truck. • Safety – Fatality rates associated with intercity trucking are eight times those associated with freight rail transportation. Railroads also have lower employee injury rates. The American Association of State Highway and Transportation Officials (AASHTO) has noted that “Relatively small public investments in the nation’s freight railroads can be leveraged into relatively large benefits for the nation’s highway infrastructure, highway users, and freight shippers.”8 The Congressional Budget Office (CBO) has also concluded that public investment in rail infrastructure should be considered: “Another way of addressing the underpayment of infrastructure costs by railroads’ competitors is to provide financial assistance to the railroads.” Echoing AASHTO, CBO observed that, “[p]roviding federal aid for a rail investment might be economically justified if the net social benefits were large but the net private benefits to railroads were insufficient to induce them to make such an investment.”9

### Rail Key to Food Prices

#### Railroad Service Disruptions Cause Food Price Shocks

Weinstein & Clower 98

Bernard L. Weinstein, Ph.D. and Terry L. Clower, Ph.D. Center for Economic Development and Research The University of North Texas.THE IMPACTS OF THE UNION PACIFIC SERVICE DISRUPTIONS ON THE TEXAS AND NATIONAL ECONOMIES: AN UNFINISHED STORY Prepared for the Railroad Commission of Texas Denton, Texas February 9, 1998, [http://digital.library.unt.edu/ark:/67531/metadc30377/m2/1/high\_res\_d/Clower-1998-Impacts\_Union\_Pacific\_Service\_Texas.pdf](http://digital.library.unt.edu/ark%3A/67531/metadc30377/m2/1/high_res_d/Clower-1998-Impacts_Union_Pacific_Service_Texas.pdf)

In 1996, the value of U.S. crop production totaled $86.3 billion, and the cost of transporting these crops to food processors was approximately $4 billion. For the state of Texas, cash receipts to farmers totaled $5.3 billion in 1996 and transportation costs came to about $250 million. As with chemicals, the nation's farmers and grain shippers depend largely on the railroads to get their crops to markets, both domestic and foreign. Agricultural shippers and receivers generally have limited access to alternative providers of transportation services because many are located beyond effective trucking distances from these markets. In addition, western growers and shippers have little access to waterway transportation, with the result that up to 80 percent of grains and cereals are shipped by rail in some states. Grain shipments by the Union Pacific have slowed markedly in recent months. According to Association of American Railroads, the UP loaded 6,104 rail cars with grain during the first week of November-- 41 percent less than the 10,343 for the same week a year ago. The Burlington Northern, partly because of the UP tie-ups, has also seen a drop-off in grain shipments-- 8,475 cars per week versus 10,892 a year ago. Some elevator operators report waiting 30 to 60 days to receive rail cars. During the STB's October 27 hearing, the National Grain and Feed Association reported that grain elevators were filled to capacity, particularly in Kansas, Oklahoma and Texas, and that local cash prices were declining because of a lack of storage. At both the STB and RRC hearings, some shippers cited numerous instances of rail cars that had been loaded with grain and billed but were sitting idle on their tracks for weeks because the Union Pacific was unable to provide locomotive power (see testimony of David Swinford, Ft. Worth hearing, pp. 7-9). Members from the Texas Panhandle reported that some customers were refusing to buy Texas-origin grain for fear of not receiving timely shipments (see testimony of Art Smith, El Paso hearing, pp. 2-3). Disruptions of agricultural shipments have also been felt in South Texas, where delays of two to four weeks for hopper cars have been common (see testimony of William Lock, Corpus Christi hearing, pp. 1-2). Movements of rice, corn, milo, soybeans and cotton have been slowed, imposing additional pressures on farmers and co-ops in the face of bumper crops and low prices. As of mid-December, grain deliveries by the Union Pacific were falling further behind schedule. These increasing delays prompted the Surface Transportation Board to order UP and the Burlington Northern Santa Fe Corporation to set up a system to minimize spoilage and get 1997’s record grain harvests moving. During the late fall, more than 50,000 carloads of grain typically flow through Texas Gulf Cost ports on their way to foreign markets. Undoubtedly, exports through these ports will be lower in 1998 because of the cumulative impacts of UP's service disruptions (see discussion of international trade below). A conservative estimate of the losses incurred by Texas' farmers and grain shippers from lower prices, foregone sales opportunities and higher freight costs is $150 million to date. These higher costs may eventually show up at the dinner table, not only for households in Texas but in all other parts of the U.S. as well.

### Rail Key to Readiness Rapid Response

#### Freight rail transportation key to national defense—speed of equipment and personnel deployment

FRA, 9

(Federal Railroad Administration, October 2009, “Preliminary National Rail Plan”, http://www.fra.dot.gov/downloads/railplanprelim10-15.pdf)

Greater use of passenger rail and freight rail holds the promise of improving our national transportation systems, reducing congestion, and diminishing petroleum use while improving the environment. These benefits enhance the livability of communities. Thus the benefits of expanded freight and passenger service to communities should be an important consideration when developing rail projects. In assessing total costs, States should consider both the community benefits and the potential community costs in developing their plans. Carefully planned economic development can also help to alleviate the recurring problem of benefits being enjoyed by one community while the costs are passed on to another, as well as “not-in-my-backyard” issues. Strategies and best-practice approaches must be developed to resolve these issues and to ensure that local concerns are addressed as regional and National needs are obtained. Effectively meet Defense and Emergency Transportation Requirements Rail transportation is important to the national defense strategy because the military’s heavy and oversized vehicles need to move by rail to seaports for deployment. The Department of Defense (DOD) has emphasized the need for rapid deployment of large numbers of people and huge amounts of materials on short notice. Similarly, following a natural disaster, rail transportation is critical to ensuring the safe evacuation of affected populations and to assisting local, State, and Federal officials in rebuilding devastated communities. Deployment of personnel, equipment, and supplies for defense and emergency relief operations requires a well planned and flexible rail network with the capacity to absorb additional traffic should the demand arise.

#### Freight rail key to national security—mobilization and over congested roads

Fritelli, 3

(John F. Frittelli Transportation Analyst for the Congressional Research Service, “Intermodal Rail Freight: A Role for Federal Funding?”, March 31, 2003, http://www.policyarchive.org/handle/10207/bitstreams/1673.pdf)

Due to economic and trade growth, some policymakers believe a “bolder vision” of rail’s place in the nation’s transportation system is necessary. Freight advocates believe that the nation’s intermodal infrastructure is failing to keep pace with international commerce. In the words of one industry representative: “The key aspect of our future is simply this. If the U.S. economy is going to continue its amazing growth, there needs to be a renaissance of the North American railroad industry. Renaissance does not come easily. I realize that many who call for dramatic change are branded as heretics, but the situation with the major railroads has to change - for everyone’s sake.31 The rail network, particularly intermodal, is also viewed as important for military mobilization. Rail is used to move unit equipment and munitions to the Department of Defense’s designated strategic seaports in the United States. DOD contracts with private commercial carriers, including railroads, to supply more than 85% of its transportation needs in both peacetime and wartime.34 Many are concerned that adequate transportation infrastructure may not exist, particularly during peak commercial shipping seasons, to handle a rapid surge in case of a military crisis. As one columnist noted:35 The concern is well founded. Continued traffic growth accompanied by asset rationalization has brought supply and demand into closer balance. The network no longer enjoys the luxury of overcapacity. As a nation, we reap the efficiencies brought about by transportation deregulation... Many people forget that, prior to deregulation, overcapacity was a specific public goal. Carriers had protected business segments in exchange for maintaining excess capacity, which would be called upon in times of national emergency.

#### Expansion of freight rail critical to military—mobilization, time, and cost

AASHTO, 3

(AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2003, “Freight-Rail Bottom Line Report”, http://rail.transportation.org/Documents/FreightRailReport.pdf)

Rail plays another critical emergency-related service role by providing efficient connections between military facilities, and by connecting these facilities with ports of embarkation during periods of overseas mobilization. The U.S. armed forces depend on rail as a critical element in the logistics chain. As the chief of the Military Traffic Management Command put it in recent testimony, “our nation’s military goes to war on rails.”13 The armed forces also are adopting pull logistics techniques and integrating their logistics systems with commercial freight systems to reduce deployment time and cost. Under peacetime conditions, the military is just another very large shipper. But with its new doctrine of rapid response, future wartime military deployments will likely occur as short, sharp surges. Large-scale deployments will stress the freight transportation system and could disrupt the tightly strung logistics networks of civil commerce and defense industry production.

#### Rail key to military deployment—connects over 130 DOD installations

Transportation Engineering Agency, 11

(Transportation Engineering Agency, the premier Department of Defense deployment engineering and analysis center,

March 1, 2011, “Railroads for National Defense (RND)”, http://www.tea.army.mil/dodprog/RND/default.htm)

The Railroads for National Defense Program (RND) ensures the readiness capability of the national railroad network to support defense deployment and peacetime needs. The Program integrates defense rail needs into civil sector planning affecting the Nation’s railroad system. Rail transportation is extremely important to DOD since our heavy and tracked vehicles will deploy by rail to seaports of embarkation. The RND Program, in conjunction with the US Federal Railroad Administration (FRA), established the Strategic Rail Corridor Network (STRACNET) to ensure DOD’s minimum rail needs are identified and coordinated with appropriate transportation authorities. STRACNET is an interconnected and continuous rail line network consisting of over 36,000 miles of track serving over 130 defense installations. We work with state DOTs, the American Association of Railroads (AAR), the Surface Transportation Board (STB), the American Railway Engineering and Maintenance of Way Association (AREMA), the Railway Industrial Clearance Association (RICA), the FRA, and individual railroad companies to protect this railroad infrastructure.

#### Freight Rail is key to public and military readiness

S.C.O.R.T. No Date Given, AASHTO Standing Committee on Rail Transportation

http://rail.transportation.org/Documents/FreightRailReport.pdf

The freight-rail system provides significant public benefits by providing cost-effective transportation that is vital to state economic development; reducing truck travel, congestion, and highway costs; providing a critical intermodal link for international trade; improving air quality and fuel efficiency; supporting military mobilization; and providing transportation-system redundancy during national emergencies.

#### Rail Key to Readiness

S.C.O.R.T. No Date Given, AASHTO Standing Committee on Rail Transportation

http://rail.transportation.org/Documents/FreightRailReport.pdf

Rail plays another critical emergency-related service role by providing efficient connections between military facilities, and by connecting these facilities with ports of embarkation during periods of overseas mobilization. The U.S. armed forces depend on rail as a critical element in the logistics chain. As the chief of the Military Traffic Management Command put it in recent testimony, “our nation’s military goes to war on rails.

#### Freight Rail Key to Military Mobilization

S.C.O.R.T. No Date Given AASHTO Standing Committee on Rail Transportation
<http://rail.transportation.org/Documents/FreightRailReport.pdf>
Freight rail, in partnership with the trucking industry, provides intermodal transportation connecting U.S. seaports with inland producers and consumers. Freight rail also carries 16 percent of the nation’s cross-border NAFTA trade. Intermodal freight-rail service is crucial to the global competitiveness of U.S. industries.  Freight rail is fuel-efficient and generates less air pollution per ton-mile than trucking.  Rail also is a preferred mode for hazardous materials shipments because of its positive safety record. Freight rail is vital to military mobilization and provides critically needed transportation system redundancy in national emergencies.

### Readiness/Rapid Response Impacts

#### Rapid response key to hegemony

Donahue and Womble, 11

(Brig. Gen. Patrick Donahue II and Lt. Col. Frank Womble (RET.), October 2011, Armed Forces Journal, “Getting There is Half the Battle,” http://www.armedforcesjournal.com/2011/10/7613840/)

The rapid projection of military power is a critical aspect of U.S. influence abroad. It underpins the nation’s ability to intervene whenever and wherever the president deems necessary in support of our national security objectives. Limits on our ability to conduct rapid strategic movement decrease our response capability and degrade national power. Yet the trend toward heavier tactical such as the MRAP family of vehicles and the development of a Ground Combat Vehicle means that deployment times, especially via strategic airlift, are likely to become longer, not shorter.

#### Military readiness necessary to prevent war—perception of deterrence

Spencer, 2000

(Jack Spencer, Policy Analyst for Defense and National Security, September 15, 2000, Heritage Foundation, “The Facts About Military Readiness”, http://www.heritage.org/research/reports/2000/09/bg1394-the-facts-about-military-readiness)

America's national security requirements dictate that the armed forces must be prepared to defeat groups of adversaries in a given war. America, as the sole remaining superpower, has many enemies. Because attacking America or its interests alone would surely end in defeat for a single nation, these enemies are likely to form alliances. Therefore, basing readiness on American military superiority over any single nation has little saliency. Military readiness is vital because declines in America's military readiness signal to the rest of the world that the United States is not prepared to defend its interests. Therefore, potentially hostile nations will be more likely to lash out against American allies and interests, inevitably leading to U.S. involvement in combat. A high state of military readiness is more likely to deter potentially hostile nations from acting aggressively in regions of vital national interest, thereby preserving peace.

#### Military readiness key to deter future conflicts

Skelton, 97

(Ike Skelton, U.S. Rep, Missouri, Congressional Record, “FUTURE OF THE U.S. MILITARY’, April 29, 1997, http://www.gpo.gov/fdsys/pkg/CREC-1997-04-28/html/CREC-1997-04-28-pt1-PgH1897.htm)

For my part, I think any attempt to see into the future is like looking into a kaleidoscope. We never know what new pattern will emerge. We only know that the colors making up the pattern will remain the same. In viewing the future of international affairs, we cannot foresee the new shape of the world, but we know that the colors are those of the human condition, including all the traits of human character and all the circumstances of human life that have ever led to war. Those colors have not changed, and the need to prepare for conflict has not diminished merely because an era of conflict with a particular foe has ended and a new era, of yet uncertain pattern, is emerging. So to respond to my colleagues who ask, ``what is the enemy,'' I say, true; today we cannot define precisely what the enemy is or will be. We can say, however, that we will fail in our responsibility in this Congress if, once again, we allow the armed forces to be unprepared for the enemies that may emerge. In fact, as I will argue today, a failure to support a strong military in the present historical circumstances would be even more unfortunate and more unforgivable than in the past for two reasons. First, today the United States is the only Nation able to protect the peace. In the past we were fortunate that allies were able, often by the narrowest of margins, to hold the line while we belatedly prepared for war. Bismarck once said: ``God protects fools, and the United States.'' Today, no one else is capable either of preventing conflict from arising in the first place, or of responding decisively if a major threat to the peace does occur. While I trust in God, I believe God has given us the tools we need to keep peace, and it is our task to use them wisely. Second, and perhaps most importantly, if we fail in our responsibility to maintain U.S. military power, the United States, and, indeed, the world as a whole, may lose an unprecedented opportunity to construct an era of relative peace that could last for many, many years. Today, our military strength is the foundation of a relatively secure international order in which small conflicts, though endemic and inevitable, will not decisively erode global stability. As such, our military strength is also a means of preventing the growth of one or more new powers that could, in time, constitute a threat to peace and evolve into the enemy we do not now foresee. Because of this, the very limited investment required to maintain our military strength, though somewhat larger than we are making right now, is disproportionately small compared to the benefits we, and the rest of the world, derive from it.

#### Readiness key to prevent multiple forms of attack—WMDs or terrorist attack

Brake, 01

(Jeffrey D. Brake, National Defense Fellow: Foreign Affairs, Defense, and Trade Division, April 19, 2001, Congressional Research Service, “Terrorism and the Military’s Role in Domestic Crisis Management: Background and Issues for Congress”, http://www.fas.org/irp/crs/RL30938.pdf)

The United States faces a number of significant national security threats, ranging in scope from intercontinental ballistic missiles to the use of weapons of mass destruction (WMD) by terrorists. The debate over the seriousness of the various threats has intensified recently. Various studies and commissions have recommended far reaching changes in the U.S. approach to domestic preparedness and response to threats to the homeland. Many experts believe the probable long term effects of a WMD attack by terrorists on the population, environment, and the economy make it imperative that the U.S. be fully prepared to either deter or interdict an attempted terrorist attack.

#### Readiness key to address future threats

Brownfield, 5/10

(Mike Brownfield, assistant director of strategic communications, May 10, 2012, “Morning Bell: Would You Take an SUV into Combat?”, http://blog.heritage.org/2012/05/10/morning-bell-would-you-take-an-suv-into-combat/)

In a new video by The Heritage Foundation, combat veteran Kerry Kachejian explains why U.S. military readiness is so crucial. He has first hand experience in the matter from his experience during the reconstruction of Iraq and Afghanistan. “Because this unit was organized, staffed, equipped and deployed so quickly, there was no spare military equipment for it,” Kachejian explained. Unable to acquire the necessary armored vehicles, his unit turned to ingenuity, courage and innovative ways to get the job done, all while coming under withering assaults from the enemy. Kachejian’s story, which is continued in new book, “SUVs Suck In Combat,” illustrates the human impact of an ill-equipped military. He tells of being jolted by a one-thousand pound truck bomb, speeding at 110 mph through the streets of Iraq, ripping tailgates off SUVs and mounting machine guns in back, and men duct-taping their body armor to their vehicles to get even the smallest level of protection. On an individual level, the lesson is clear — our men and women soldiers are risking their lives in defense of freedom, and yet they’re ill-equipped to get the job done. But from the ground level to the global stage, a weak, unprepared military poses great threats, as well. Unfortunately, the U.S. military is in very real danger of growing weaker, losing its deterrent force, and being left unable to fight and win wars in defense of America. There are those in Washington who believe that America can afford to slash the military in order to shift that money elsewhere. That, though, will leave the military hollow and ill-prepared for growing threats. In a newly released Heritage lecture on the Obama Doctrine of humble engagement with friends and enemies, Kim R. Holmes explains that despite the president’s claim that the world is more secure, serious threats remain, all while the military’s readiness is being depleted.

### Rail Transition Solves Emissions

#### Railroads Are Far More Efficient Than Trucks, Solve Massive Climate Emissions

AAR ‘11

Association of American Rairoads. Freight Railroads Help Reduce, Greenhouse Gas Emissions, Association of American Railroads November 2011, <http://www.aar.org/~/media/aar/Background-Papers/Freight-RR-Help-Reduce-Emissions.ashx>

According to a recent independent study for the Federal Railroad Administration, railroads on average are four times more fuel efficient than trucks. Greenhouse gas emissions are directly related to fuel consumption. That means that moving freight by rail instead of truck reduces greenhouse gas emissions by 75 percent. If just 10 percent of long-haul freight now moving by truck moved by rail instead, annual greenhouse gas emissions would fall by more than 12 million tons. That’s equivalent to taking 2 million cars off the road or planting 280 million trees. Cumulative reductions through 2020 would be around 160 million tons. Moving more freight by rail also reduces highway congestion, which costs us $101 billion each year just in wasted time (4.8 billion hours) and wasted fuel (1.9 billion gallons), according to a recent study by the Texas Transportation Institute. A single freight train, though, can carry the load of several hundred trucks. Shifting freight from trucks to rail also reduces highway wear and tear and the pressure to build costly new highways.

#### Freight Rail Investment Solves Climate—Better Than HSR and Sparks Private Sector Innovations

McCain ‘10

E.D. KAIN, Investing in freight rail could help curb climate change, <http://trueslant.com/erikkain/2010/07/27/investing-in-freight-rail-could-help-curb-climate-change/>, Jun 27.

Developing the infrastructure of the future strikes me as a much better idea than crafting legislation which would, in an effort to curb carbon emissions, create a vast, expensive and easily captured trading system for carbon (cap and trade). While the focus has largely been on creating new high-speed rail for passengers, investing in freight rail may be even more important. As fuel costs continue to rise in the coming decades, the cost of goods will be dramatically effected by the increased shipping costs. Laying the rail necessary to improve our freight rail lines would drastically improve our logistical prospects for future generations. Furthermore, many of the nation’s roads are already overcrowded, and some are becoming dangerously so, a state of affairs exacerbated by the volume trucks on the road. This creates an immediate burden on local infrastructure across the nation that could be alleviated to some degree by increased rail capacity.Nor are we simply talking about the rail lines themselves. More investment in rail spurs is also necessary if more and more freight is going to start moving this way, as well as technological investments. Many of these investments will need to come from the private sector, but modernizing and expanding the railways themselves can be a smart way to use public dollars to free up rail companies to invest in other areas.

#### Rail Improvement Solve Fuel Price Shocks & Climate

McCain ‘10

E.D. KAIN, Investing in freight rail could help curb climate change, <http://trueslant.com/erikkain/2010/07/27/investing-in-freight-rail-could-help-curb-climate-change/>, Jun 27.

A combination of increased freight and passenger rail makes sense to me in the long haul – certainly as a way to combat climate change, this is a much smarter move than cap and trade since it would use tax dollars to actually create something. America is a big country, and to keep our economy running at full steam, public investment in infrastructure is perhaps one of the best places to spend. Reihan is concerned that an increased investment in passenger and freight rail capacity would create an unnecessarily high tax burden. This may be true. If I had to pick, at this point I’d say that freight – which is already largely in place – is the right place to start. But I’m a supporter of passenger rail as well. It may not make a huge amount of sense now, but I do see gas prices topping four and five dollars in the not-too-distant future, and as we move in that direction, it wouldn’t hurt to anticipate some of the new infrastructure needs our economy will face as more people turn toward public transportation.

### Rail Innovation Solve Future Emissions

#### **Innovations Mean Freight Rail Efficiency and Emissions Will Continue to Improve**

AAR ‘11

Association of American Railroads. Freight Railroads Help Reduce, Greenhouse Gas Emissions, Association of American Railroads November 2011, <http://www.aar.org/~/media/aar/Background-Papers/Freight-RR-Help-Reduce-Emissions.ashx>

In 1980, one gallon of diesel fuel moved one ton of freight by rail an average of 235 miles. In 2010, one gallon of fuel moved one ton of freight by rail an average of 484 miles — a 106 percent improvement since 1980. In 2010 alone, U.S. freight railroads consumed 3.7 billion fewer gallons of fuel and emitted 41 million fewer tons of carbon dioxide than they would have if their fuel efficiency had remained constant since 1980. From 1980 through 2010, U.S. freight railroads consumed almost 59 billion fewer gallons of fuel and emitted 658 million fewer tons of carbon dioxide than they would have if their fuel efficiency had not improved. Railroads use a variety of means to cut fuel consumption and greenhouse gas emissions: Dramatically increasing how much freight is carried in an average rail carload and average train. Thanks to improved freight car design and other factors, the average freight train carried a record 3,585 tons of freight in 2010, up 61 percent since 1980.  New locomotives. Railroads have spent billions of dollars in recent years on thousands of new, more fuel efficient locomotives and on overhauling older units to make them more fuel efficient. Many older, less fuel efficient locomotives have been retired from service. Many new switching locomotives used to assemble and disassemble trains in rail yards are “genset” (generator set) locomotives. Gensets have two or three independent engines that switch on and off depending on how much power is needed for the task at hand. Some switching locomotives are hybrids with a small diesel-fueled engine and a large bank of rechargeable batteries. Research is underway on hybrid long-haul locomotives.  Developing and implementing highly advanced computer software systems that, among other things, calculate the most fuel-efficient speed for a train over a given route; determine the most efficient spacing and timing of trains on a railroad’s system; and monitor locomotive functions and performance to ensure peak efficiency. These systems can provide locomotive engineers with real-time “coaching” on the best speed for a train from a fuel-savings standpoint. Training. Railroad fuel efficiency depends on how well a locomotive engineer handles a train. That’s why railroads use the skills of their engineers to save fuel. For example, railroads commonly offer training programs through which locomotive engineers offer suggestions to their colleagues on ways to save fuel.  Reduced idling. Railroads are implementing “stop-start” idling-reduction technology that allows main engines to shut down when ambient conditions are favorable. One advantage of “genset” locomotives is that their smaller engines use antifreeze, thus allowing them to shut down in cold weather. Some railroads also use “auxiliary power units” that warm engines so that locomotives can be shut down in cold weather.  Expanding the use of distributed power (positioning locomotives in the middle of trains) to reduce the total horsepower required for train movements.  Improving rail lubrication to reduce friction at the wheel-rail interface, saving fuel and reducing wear and tear on track and locomotives.

### Coal Demand Key to Freight Rail Industry

#### Decrease in Coal Demand Crushes Freight Railroad Industry

Eaken et al. ‘11

B. Kelly Eakin is senior vice president at Christensen Associates, where

A . Thomas Bozzo, Ma r k E. Me i t z en, and Phi l i p E. Sc hoe c h are

vice presidents.Railroad Performance Under the Staggers Act Deregulation revived the rail freight industry, with most of the gains going to shippers. Regulation | Winter 2010–2011, http://www.cato.org/pubs/regulation/regv33n4/regv33n4-6.pdf

But the challenges facing the railroad industry go beyond the recent economic downturn. We agree with the observation of our Christensen Associates colleagues in their article (p. 28) that “economies of density work both ways.” Just as the industry’s recovery can be largely attributed to the growth of coal and intermodal traffic, the railroads appear vulnerable to future structural shifts that could work to decrease traffic density. A plausible scenario would be a significant lessening of the social appetite for coal, which would diminish the industry’s low-cost baseline load. Likewise, interruptions or contractions of international trade could substantially reduce the railroads’ higher-margin intermodal traffic. Either scenario could reverse the productivity gains achieved from increased density, put a greater overhead burden on customers, and worsen the financial condition of the railroads.

### Rail Key to Readiness

#### Rail needed for military mobilization

Frittelli 3, John F. Transportation Analyst Resources, Science, and Industry Division
<http://www.policyarchive.org/handle/10207/bitstreams/1673.pdf>
The rail network, particularly intermodal, is also viewed as important for military mobilization. Rail is used to move unit equipment and munitions to the Department of Defense’s designated strategic seaports in the United States. DOD contracts with private commercial carriers, including railroads, to supply more than 85% of its transportation needs in both peacetime and wartime.34 Many are concerned that adequate transportation infrastructure may not exist, particularly during peak commercial shipping seasons, to handle a rapid surge in case of a military crisis.

#### Freight key to national security, military, businesses, and safety

Tamba Bay Freight 1, **From DoD Stovepipes to** “Focused **Logistics”** "Focused Logistics" is the capstone logistics concept of the Joint Chiefs of Staff. <http://www.tampabayfreight.com/pdfs/Freight%20Library/nov2009/04_FrmDoDStvepipsToFocusdLogs.pdf>
Defense freight transportation issues are important to DOT in at least four ways.3 First, an effective transportation system is essential to support national security and military deployments. Second, defense deployments have the potential to disrupt the transportation system and the economy. Third, defense freight transportation has important business impacts on major transportation industry sectors. Finally, safety is a continuing concern because DoD ships large amounts of munitions.

#### Armored Divisions require rail transportation

Hillis 99, (Shaun A. Hillis-Commander in the US Navy, March 1999, “AN ANALYSIS OF COMMERCIAL RAILROAD CONGESTION AND ITS RESULTANT IMPACT ON FORT-TO-PORT TRANSPORTATION EFFORTS” Naval Post-grad school in Monterey California. http://stinet.dtic.mil/cgi-bin/GetTRDoc?AD=ADA361478&Location=U2&doc=GetTRDoc.pdf)

The unit equipment organic to a U.S. Army Armored Division requires rail transportation due to the extraordinary weights associated with the armored vehicles. The unit equipment and its associated transport equipment often exceeds the limits for state highway permits.

### Rail Congestion Military readiness

#### Freight rail congestion kills military readiness

Hillis 99, (Shaun A. Hillis-Commander in the US Navy, March 1999, “AN ANALYSIS OF COMMERCIAL RAILROAD CONGESTION AND ITS RESULTANT IMPACT ON FORT-TO-PORT TRANSPORTATION EFFORTS” Naval Post-grad school in Monterey California. <http://stinet.dtic.mil/cgi-bin/GetTRDoc?AD=ADA361478&Location=U2&doc=GetTRDoc.pdf>)

The United States Army is heavily dependent upon commercial railroad transportation assets for the movement of cargo and equipment from Continental United States (CONUS) installations to Seaports of Embarkation during unit mobilizations. With the withdrawal of forces from overseas installations, this dependence upon commercial rail assets has grown dramatically in the past few years. Due to a series of consolidations and mergers, the CONUS rail infrastructure has reached full capacity and is straining to meet civilian demands for rail services. If an environment of congestion, resulting in unanticipated delays, were to develop anywhere within the CONUS rail infrastructure, the movement of military unit cargo and equipment in response to a crisis mobilization or deployment would be severely impacted.

#### Freight rail congestion kills military readiness

Hillis 99, (Shaun A. Hillis-Commander in the US Navy, March 1999, “AN ANALYSIS OF COMMERCIAL RAILROAD CONGESTION AND ITS RESULTANT IMPACT ON FORT-TO-PORT TRANSPORTATION EFFORTS” Naval Post-grad school in Monterey California. http://stinet.dtic.mil/cgi-bin/GetTRDoc?AD=ADA361478&Location=U2&doc=GetTRDoc.pdf)

The United States Army is heavily dependent upon commercial railroad transportation assets for the movement of tracked and wheeled vehicles from origin to Seaports of Embarkation (SPOE's) during unit mobilizations. Upon arrival at the SPOE, the transported equipment is staged and ultimately loaded onto Military Sealift Command (MSC) organic or contractual assets for further transportation to the Theater of Operations (TOO). During Operation Desert Shield/Desert Storm, the Military Traffic Management Command (MTMC) routed 1.2 million tons of unit cargo and equipment to U.S. SPOE's on nearly 16,000 commercial rail cars [Ref. l:p. 166]. Additionally, the Defense Freight Railway Interchange Fleet (DFRIF) of approximately 1500 heavy-duty flatcars was used extensively to transport heavy tracked equipment such as the Ml Abrams and M60 tanks. Shortly after the merger of the Union Pacific and Southern Pacific railroads in 1997, severe rail congestion began to affect rail operations in the Western United States. Shippers within the state of Texas experienced delays ranging from days to several weeks. Delays of seven to ten days were experienced in California. These delays caused by rail congestion would have a significant impact on the movement of military unit cargo and equipment to SPOE's.

#### Prompt transportation of assets via railways is crucial to military readiness—Congestion cascades crushing all transport

Hillis 99, (Shaun A. Hillis-Commander in the US Navy, March 1999, “AN ANALYSIS OF COMMERCIAL RAILROAD CONGESTION AND ITS RESULTANT IMPACT ON FORT-TO-PORT TRANSPORTATION EFFORTS” Naval Post-grad school in Monterey California. http://stinet.dtic.mil/cgi-bin/GetTRDoc?AD=ADA361478&Location=U2&doc=GetTRDoc.pdf)

Prompt and sustained transportation efforts are vital to a successful unit mobilization or deployment. This is even more crucial during times of heightened tensions or world crisis. As a result of this need for prompt transportation efforts, the Department of Defense can be severely impacted by rail congestion. Railroad transportation efforts can be hampered by a number of factors. Shortages of locomotive power, locomotive crews, and system congestion can all impact a rail system's integrity and smooth functioning. Capacity constraints may also lead to congestion. Congestion centered on one region of the country can easily spread to other regions due to the reliance on interchange traffic between railroads. A railroad located in the Eastern United States that is transporting unit equipment to the west coast of the United States must transfer the loaded railcars to a western railroad to complete the transit. Severe congestion results in poor asset utilization. Additionally, locomotive power, rolling stock, and crews are not always located where they are needed due to crews running into the "hours of service" laws (US Code Title 49, Section 21103). Another factor exacerbating congestion is the use of trackage rights in which one railroad operates over another railroad's tracks to service a region or customer. As one railroad begins to suffer from congestion, another railroad with trackage rights is unable to move freight over the requisite tracks. Delays on one railroad soon begin to impact another. These delays soon ripple throughout the U.S. rail industry impacting all railroads, not just the one where the congestion originated. Congestion in Houston, Texas, can easily impact Southern California ports. An example of congestion rippling throughout the country can be demonstrated by the congestion that resulted after the Union Pacific Railroad merged with the Southern Pacific railroad. What started out as mild congestion limited to several ex-Southern Pacific rail yards in Houston, Texas, soon crippled rail traffic from Louisiana to Southern California

### Rail Congestions Spills Over to Highways

Massive Congestion Will Increase in the Future and Spill Over to Highways—Need Fed Investment

Cambridge Systematics ‘7

Cambridge Systematics is a research and policy organization dedicated to providing analysis and solutions to transportation issues. “National Rail Freight Infrastructure

Capacity and Investment Study,” <http://www.aar.org/~/media/aar/Files/natl_freight_capacity_study.ashx>, September

This study estimates that an investment of $148 billion (in 2007 dollars) for infrastructure expansion over the next 28 years is required to keep pace with economic growth and meet the U.S. DOT’s forecast demand. Of this amount, the Class I freight railroads’ share is projected to be $135 billion and the short line and regional freight railroads’ share is projected to be $13 billion. Without this investment, 30 percent of the rail miles in the primary corridors will be operating above capacity by 2035, causing severe congestion that will affect every region of the country and potentially shift freight to an already heavily congested highway system. The investment requirement is driven by three factors: demand, current system capacity, and infrastructure expansion costs. The U.S. DOT estimates that population growth, economic development, and trade will almost double the demand for rail freight transportation by 2035. The projected rate of growth over the next 30 years is not extraordinary, but it comes after two decades of growth in rail freight tonnage that has absorbed much of the excess capacity in the existing rail freight system. Most of the moderate-cost capacity expansions have already been made; future capacity expansions will be purchased at a higher cost because they will require expensive new bridges and tunnels and more track and larger terminals in developed areas. Meeting the U.S. DOT’s forecast demand will require the Class I freight railroads to increase their investment in infrastructure expansion. The Class I railroads anticipate that they will be able to generate approximately $96 billion of their $135 billion share through increased earnings from revenue growth, higher volumes, and productivity improvements, while continuing to renew existing infrastructure and equipment. This would leave a balance for the Class I freight railroads of $39 billion or about $1.4 billion per year to be funded from railroad investment tax incentives, public-private partnerships, or other sources. These investment projections assume that the market will support rail freight prices sufficient to sustain long-term capital investments. If regulatory changes or unfunded legislative mandates reduce railroad earnings and productivity, investment and capacity expansion will be slower and the freight railroads will be less able to meet the U.S. DOT’s forecast demand. The findings of this study provide a starting point for assessing future rail freight capacity and investment requirements. The findings outline the improvements and investments required for the railroads to carry the freight tonnage forecast by the U.S. DOT. Additional work is needed to determine how much more capacity and investment would be needed for the railroads to increase their share of freight tonnage and reduce the rate of growth in truck traffic on highways. Finally, the forecasts and improvement estimates in this study do not fully anticipate future changes in markets, technology, regulation, and the business plans of shippers and carriers. Each could significantly reshape freight transportation demand, freight flow patterns, and railroad productivity, and, thus, rail freight infrastructure investment needs. In summary, the findings point clearly to the need for more investment in rail freight infrastructure and a national strategy that supports rail capacity expansion and investment.

### Terrorist Attacks Coming Now

#### Rail security bad now; leads to increased terrorist attacks, among other threats

Statement of Peter F. Guerrero, Director, Physical Infrastructure Issues; and Norman J. Rabkin, Managing Director, Homeland Security and Justice Issues; March 23, 2004

Securing the passenger and freight rail systems are fraught with challenges. Some of these challenges are common to passenger and freight rail systems, such as the funding of security improvements, the interconnectivity of the rail system, and the number of stakeholders involved in rail security. Other challenges are unique to the type of rail system. For example, the open access and high ridership of mass transit systems make them both vulnerable to attack and difficult to secure. Similarly, freight railroads transport millions of tons of hazardous materials each year across the United States, raising concerns about the vulnerability of these shipments to terrorist attack. Passenger and freight rail stakeholders have taken a number of steps to improve the security of the nation’s rail system since September 11, 2001. Although security received attention before September 11, the terrorist attacks elevated the importance and urgency of transportation security for passenger and rail providers. Consequently, passenger and freight rail providers have implemented new security measures or increased the frequency or intensity of existing activities, including performing risk assessments, conducting emergency drills, and developing security plans. The federal government has also acted to enhance rail security. For example, the Federal Transit Administration has provided grants for emergency drills and conducted security assessments at the largest transit agencies, among other things. Implementation of risk management principles and improved coordination could help enhance rail security. Using risk management principles can help guide federal programs and responses to better prepare against terrorism and other threats and to better direct finite national resources to areas of highest priority. In addition, improved coordination among federal entities could help enhance security efforts across all modes, including passenger and freight rail systems. We reported in June 2003 that the roles and responsibilities of the Transportation Security Administration (TSA) and the Department of Transportation (DOT) in transportation security, including rail security, have yet to be clearly delineated, which creates the potential for duplicating or conflicting efforts as both entities work to enhance security.

#### Lack of rail security gives way to terrorist attacks and endangers many lives

Eben Kaplan, Congressional Staffer, March 12, 2007, [“Rail Security and the Terrorist Threat”]

<http://www.cfr.org/united-states/rail-security-terrorist-threat/p12800>

High profile terrorist attacks on rail systems in Madrid, London, and Mumbai provide troubling illustration to persistent warnings that the U.S. public transportation system is a vulnerable target for terrorists. But passenger rail is not the only, and perhaps not even the gravest concern. Much of the 160,000 miles of railroad track in the United States transports freight, including highly toxic chemicals. These shipments often have minimal security, even though they pass through populated areas, endangering thousands of lives.

#### Low-security cargo rails present a serious threat through dangerous chemical leaks

Eben Kaplan, Congressional Staffer, March 12, 2007, [“Rail Security and the Terrorist Threat”]

<http://www.cfr.org/united-states/rail-security-terrorist-threat/p12800>

Many of the tracks that carry passenger trains run parallel to those carrying freight shipments throughout the United States, meaning rail cargoes often travel along the same heavily populated corridors. Much of the freight presents little danger to people living near the tracks, but some does—particularly certain industrial chemicals. The deadliest of these chemicals are almost identical to those used as weapons on the battlefields of World War I, and in 2005 former White House Deputy Homeland Security Adviser Richard Falkenrath told the Senate these chemicals pose “the single greatest danger of a potential terrorist attack in our country today.” Hazardous chemicals travel on railcars in ninety-ton pressurized tanks. What little security exists along their route tends to be lax, and at times tanks sit unmonitored in rail yards for days at a time. Should one of these tanks rupture—either from a terrorist attack or an accident—the results could be catastrophic. Fred Millar, a rail security lobbyist and former member of the Washington, D.C. local Emergency Planning Committee, likens the shipment of chemicals through America’s biggest cities to “pre-positioning weapons of mass destruction.” Dr. Jay Boris of the Naval Research Laboratory in Washington, D.C., told the City Council that the worst-case scenario for that city could result in up to a hundred thousand fatalities. A video from his laboratory simulates the [spread of a toxic gas](http://www.pbs.org/cgi-registry/mediaplayer/videoplayer.cgi?playeraddress=videoplayer.cgi&media=%2Fmedia4%2Fnow%2Fdirty-bomb-simulation-lo.rm%2C%2Fmedia4%2Fnow%2Fdirty-bomb-simulation-hi.rm%2C%2Fnow%2Fdirty-bomb-simulation-hi.mov%2C%2Fnow%2Fdirty-bomb-simulation-lo.mov&title=Airborne%20Contaminant%20Simulations&playertemplate=%2Fnow%2Fmedia_player%2Fvideo.html&description=Simulations%3A%20U.S.%20Naval%20Research%20Laboratory" \t "_blank) cloud over three major U.S. cities. A more conservative 2004 Homeland Security Council [report (PDF)](http://www.globalsecurity.org/security/library/report/2004/hsc-planning-scenarios-jul04_exec-sum.pdf%22%20%5Ct%20%22_blank) estimated that a ruptured chlorine gas tank in a densely populated area could kill as many as 17,500 people and injure an additional 10,000. In addition to the dead and wounded, tens of thousands would have to evacuate, causing widespread panic.

### Terrorist Attack on Hazmet Freight Coming

#### Terrorist attacks a threat to hazardous materials freight rail

Capra 2006

(Gregory S. Capra serves as the Chief of the Program Management Office, Air Force Center for Environmental Excellence, Andrews AFB, Maryland. He earned a bachelor’s degree in Civil Engineering from the University of Colorado and a master’s degree in Strategic Studies from the Air War College at Maxwell AFB, Alabama. He is licensed as a Professional Engineer in the Commonwealth of Virginia. December 2006 "PROTECTING CRITICAL RAIL INFRASTRUCTURE" http://cpc.au.af.mil/PDF/monograph/criticalrailinfrastructure.pdf)

To demonstrate how terrorists could launch a catastrophic attack in the northeast corridor, note a recent accident in Baltimore. In June 2001, a 60-car CSX freight train carrying hazardous materials derailed in the Howard Street Tunnel running through the center of Baltimore. The tunnel is the only freight through-route from the southern states through Washington, D.C., Baltimore, and New York. One end of the tunnel is located near Camden Yards where the Baltimore Orioles play baseball. 52 The derailment, which was an accident but which, in the future, could be duplicated by a terrorist attack, ignited a fire in the tunnel that lasted five days and released hazardous materials (see Figure 3). 53 While no one was harmed, it could have been deadly if the cargo had been chlorine gas.

#### High Risk of Terrorist Attack on Freight Rail

Capra 2006

(Gregory S. Capra serves as the Chief of the Program Management Office, Air Force Center for Environmental Excellence, Andrews AFB, Maryland. He earned a bachelor’s degree in Civil Engineering from the University of Colorado and a master’s degree in Strategic Studies from the Air War College at Maxwell AFB, Alabama. He is licensed as a Professional Engineer in the Commonwealth of Virginia. December 2006 "PROTECTING CRITICAL RAIL INFRASTRUCTURE" http://cpc.au.af.mil/PDF/monograph/criticalrailinfrastructure.pdf)

The second highest risk target in the rail system is when hazardous materials are transported by freight railroads through densely populated areas. This assessment is based on the understanding that an attack on trains carrying hazardous materials in the middle of a city could inflict a significant loss of life, and create significant economic disruption. This is also a major risk due to the vulnerability of the unsecured maintenance and transfer yards, the vulnerability of trains to attack when approaching choke points like tunnels and bridges, and the criticality of the bridges and tunnels in the network. The railroad executives very much need to continue to work to secure the perimeter of maintenance and transfer yards, bridges, and tunnels in order to reduce this risk.

#### Terrorist attacks on rails transporting “Hazmat” material is a unique problem now

AAR 08, (Association of American Railroads, 7-10-2008, “COMMON CARRER OBLIGATION OF RAILROADS--- TRANSPORTATION OF HAZARDOUS MATERIALS” http://www.aar.org/Safety/~/media/aar/Testimony/2008/2008-07-10-STBERH-written.ashx)

It should also be noted that rail transportation of TIH is far riskier now than at the time of

the Conrail case (1986). There are terrorism concerns that did not previously exist and that

severely affect the risk profile of TIH materials transportation. Indeed, potential terrorist attacks

on rail transportation of TIH materials are one of the principal focus points

US Rails vulnerable now-lack of funding

Stoller 10

Gary Stoller, writer for The USA Today, 12-27-2010, “Can trains, subways be protected from terrorists?” <http://travel.usatoday.com/news/2010-12-27-railsecurity27_CV_N.htm>)

'Vulnerable to attack' Although terrorists have yet to successfully strike, U.S. rail and transit officials know their systems are targets susceptible to attack. "Mass transit systems, by nature, are open systems and vulnerable to attack," says Lisa Farbstein, a spokeswoman for the Washington Metropolitan Area Transit Authority. "The Metro system is no different, with multiple entrances and exits designed to move a large number of riders." Amtrak, which carries nearly 30 million passengers annually to more than 500 stations in 46 states, Washington and three Canadian provinces, agrees. "Amtrak functions in a very open and, therefore, porous transportation environment," spokesman Steve Kulm says. "Because of advantages such as easy access, convenient locations and intermodal connections, rail and mass transit systems are completely different from the structure and organization of the airline transportation and airport industry." A July report by the Government Accountability Office says high ridership, expensive infrastructure, economic importance and location in large metropolitan areas or tourist destinations also make passenger rail systems "attractive targets for terrorists." Subways and trains have been more frequently attacked worldwide than aircraft and airports, USA TODAY's analysis of the National Counterterrorism Center's database shows. There were 213 attacks on subways and trains from Jan. 1, 2005, through June 30, 2010, compared with 197 attacks on aircraft and airports. In the subway and rail attacks, 700 were killed, 3,262 wounded and 3,114 taken hostage. In the aircraft and airport attacks, 238 were killed, 937 were wounded and 281 were taken hostage. The statistics include March suicide bombings that killed 40 people in the Moscow subway system but do not include a 2004 attack in Madrid that killed 191 after 10 bombs exploded on four trains. "Logic dictates that because mass transit is 'mass,' terrorists are interested in attacking it to maximize death, injury and panic," says Ervin, the former Homeland Security Department inspector general. Can't screen every passenger Perhaps the only way to make subway and rail cars secure is to screen every passenger similar to what the TSA and its 50,000 screeners and some private contractors do at airports. And some passengers, such as Carl Woodin of Maple Glen, Pa., say they wouldn't mind it. He says security was poor during the 24 trips he took this year on subway, Amtrak and other trains. "I always thought that a terrorist could very easily board a New Jersey Transit or Amtrak train on the Northeast Corridor and demolish New York's Penn Station and Madison Square Garden," says Woodin, president of a multimedia company. But security analysts say screening all subway and rail passengers is impractical and too costly. And the TSA "is not considering" requiring it, the agency said in a written response to USA TODAY questions. "Mass transit systems in the U.S. are vast, a literal black hole," says James Carafano, a homeland security expert at The Heritage Foundation, a conservative Washington think tank. "They would consume every cent we spend on homeland security, and there still would be vast vulnerabilities." Brian Jenkins, security research director for the Mineta Transportation Institute, which is funded by Congress and researches transportation policy issues, estimates that it costs $8 to $10 to screen a single passenger. "If you add that cost to a subway fare, it would destroy public transportation," Jenkins says. Screening all passengers could also slow mass transit to a crawl because most subway and rail riders travel en masse during weekday rush hours, security experts say. Many riders with a 20-minute or less commute would not accept a 20-minute or so security-screening delay and would opt for another means of transportation, Jenkins says. "One hundred percent screening of rail passengers is not realistic," he says. "You might need hundreds of thousands of screeners." Security rests in local hands TSA has devoted most of its resources to air security after the 2001 attacks on New York and Washington, leaving subway and rail security primarily to transit authorities, local governments and rail operators, including many that are not in good financial condition. In an April report, the American Public Transportation Association said public transportation systems "are facing unprecedented funding challenges due to widespread declining state and local revenues." The association, which represents transit agencies and rail and bus operators, found 70% of 151 transit systems that responded to an association survey project "budget shortfalls" this year. William Millar, the association's president, says transit authorities don't have the necessary resources. More than $30 billion has been allocated for aviation security since 9/11, compared with $1.7 billion for subway, passenger rail, cargo rail, bus and some ferry security, Millar says. Police Chief Paul MacMillan of the Massachusetts Bay Transportation Authority, which operates transit systems in Boston, says, "We understand the commitment to aviation," but "There needs to be a commitment by the federal government to dedicate more attention to mass transit." Rep. Bennie Thompson, D-Miss., chairman of the House Committee on Homeland Security, says he's "deeply troubled" by the small amount of TSA's budget devoted to transit and rail security. Fewer than 2 million airline passengers fly daily, and about 34 million rail and transit passenger trips are taken each weekday, he says. "Although funding for surface transportation security at TSA was doubled for fiscal year 2010 (which ended Sept. 30), it still only constituted less than 2% of TSA's budget, compared to around 85% for aviation," Thompson says. TSA spokeswoman Kristin Lee says that "the Obama administration has made extraordinary investments in surface transportation security" during the past two budget years, including allocating $850 million for transit agencies, funding local anti-terrorism teams and launching a program with Amtrak to encourage passengers to report suspicious activity. More random screening In the absence of universal screening, the TSA has pushed random screening of passengers and a show of force as a deterrent to attacks. Random screening, the TSA says, has been conducted by transit and rail authorities in the New York and Boston subway systems and in Amtrak stations in the Northeast. On Dec. 16, Washington, D.C., Metro police said they would begin random inspections of passengers' carry-on items. The TSA says it will partner next year with local law enforcement to conduct random screening in additional locations. The TSA says it this year conducted with local law enforcement more than 6,500 "Visual Intermodal Prevention and Response teams operations" — an unannounced, high-visibility presence of security officers at a transportation facility — in various transportation modes, including mass transit and passenger rail systems. The teams were created in response to the March 2004 bombings of commuter trains in Madrid. However, the Government Accountability Office in a May report said questions have been raised about the effectiveness of the program. The Department of Homeland Security's Office of Inspector General said the TSA needed to develop a more collaborative relationship with local transit officials, and the GAO said TSA had not fully established performance measures to assess the results of its prevention and response teams. Thompson, the House homeland security committee chairman, says no funds should be provided to the program until a federal grant program allocating security money to transit agencies is fully funded. Federal money also needs to be "significantly" increased for canine teams for rail and transit authorities, and the Department of Homeland Security needs to develop initiatives to "encourage innovation and technology" for rail and transit security, he says. Thompson also criticizes the TSA for "very poor management" in its Surface Transportation Security Inspection office. The office determines the tasks of inspectors who evaluate rail and mass transit security and are on the prevention and response teams. Thompson's counterpart in the Senate — Sen. Joseph Lieberman, I-Conn., who chairs the Homeland Security and Governmental Affairs Committee — says, "Rail and transit security will never achieve the level of security that exists at airports." However, he says, there needs to be more video surveillance and installation of sensors "that automatically detect chemical, biological and explosive threats." Other security holes Other holes in rail security exist, security analysts say. An explosive device could be placed in subway or rail cars when they're out of service in a train yard. They can be attacked traveling between stations. Or, the rails, bridges and tunnels they ride on or pass through could be sabotaged. Amtrak says its trains operate on more than 21,000 miles of track. Still, there's a difference in what a terrorist can do to a train vs. a plane, says Ron Heil, a security consultant for transportation industry firm TranSystems. "The airplane can be used as a weapon of mass destruction, such as in the 9/11 attacks, and there is no recovering from even a small blast at 40,000 feet," Heil says. "Trains must travel on rails, making them hard to steer into other targets but easy to attack externally on their routes." And despite rail's vulnerability, several security experts say securing subways and trains shouldn't come at the expense of secure skies. "Terrorists have been trying relentlessly to attack aviation since 9/11," says Carafano of The Heritage Foundation. "Only an idiot would divert resources from aviation security to rail." Ultimately, analysts say, the key to thwarting terrorism on the nation's rails is intelligence to prevent an attack — which has worked. "The government must use intelligence and surveillance procedures to see to it that no terrorist has a chance to attack," says Walid Phares of the Foundation for Defense of Democracies, a Washington, D.C.-based policy institute focusing on terrorism.

### Electrification Air Pollution

#### Electrification Solves Air Pollution

Jim Fiske, Founder and CTO, Gravity Power LLC; VP of Advanced Systems, LaunchPoint Technologies, Inc., 2012 [“The Air Pollution Problem”] <http://www.launchpnt.com/portfolio/transportation/freight-rail-electrification/>

Air pollution resulting from operations at the ports of Los Angeles and Long Beach in California has become a critical problem, with a huge impact on the health of the surrounding population. A similar situation exists in many other areas of the state. Health care costs resulting from low air quality are expected to exceed $200 billion in California over the next fifteen years. Recent efforts to clean up the diesel engines used in ships, locomotives, trucks and off-road equipment are producing significant improvements, but the rapidly growing volume of freight shipments threatens to overwhelm these efforts and drive air quality even lower. LaunchPoint Technologies has discovered a solution—the “Rail Motor” (patent pending). This is a new type of linear electric motor that could propel standard rail vehicles, including locomotives and freight cars, with no modification of the vehicles. The motor would be installed in the track, would require no mechanical connection to the vehicles, and would be electronically controlled by the train engineer via a wireless radio connection. It may be capable of providing even higher motive power to a typical freight train than is currently practical with diesel locomotives (such as the additional power needed to transit the 4,190 foot-high Cajon Pass), and could also be used to brake trains descending steep grades, recovering the energy in the form of electricity. When employed in places such as the Alameda Corridor or the Cajon Pass, it could result in totally electric operation of freight traffic, removing local sources of air pollution entirely, while increasing the speed and throughput capability of the rail lines.

#### Electric rails take the place of bus transit while emitting no pollution

Christopher M. Puchalsky, author of “Comparison of Emissions from

Light Rail Transit and Bus Rapid Transit”, **2005** <http://www.actfortransit.org/docs/2008JulLRTvsBRTemmissions.pdf>

Bus rapid transit (BRT) is an evolving public transportation mode consisting of rubber-tired vehicles running on dedicated rights-ofway (ROWs) for all or part of a transit route. The vehicles are typically diesel powered, although some are dual diesel and electric. BRT evolved from standard bus service in North and South America as an effort to improve bus transit and make it more competitive with the private automobile (2). Elements that distinguish BRT from standard bus service are upgraded ROW, fare prepayment, larger station spacing, signal priority, and other intelligent transportation system elements. BRT is currently being advocated by many groups, including the Federal Transit Administration. BRT has emerged as a low-cost contender against light rail transit (LRT) in many situations. The relative merits of both modes are often debated generically and for speciﬁc applications. One area of comparison is energy use and pollution emissions. Electric rail vehicles emit no propulsion system pollution at their point of operation. They are responsible for fuel cycle emissions from electricity generating plants, which tend to be located on the urban periphery, and other upstream processes. Diesel buses, however, have typically been perceived as producing strongly negative pollution-related externalities directly into the highdensity areas that they serve. Diesel buses are also responsible for other emissions due to reﬁning and other processes in the fuel cycle. In the area of energy consumption, rail, with its low-friction steel-onsteel support and guidance technology, has been assumed to be superior to rubber-tired buses. Because of these factors, electric LRT and other rail transit modes have been considered superior to diesel BRT and other bus modes in terms of emissions.

### Electrification 🡪 Renewable Transition

Electrification rail sparks reliable power grid and transition to alternative energy

Drake 8, Alan, consulting engineer, “Multiple Birds-One Silver BB: A synergistic set of solutions focused on Electrified Railroads, 7/15/08, http://www.theoildrum.com/node/4301 Accessed: 6/26/12

Electrification will likely require substations every 20 to 30 miles, depending on the voltage chosen and the traffic density. In the more remote areas, the railroads will not be able to tap into the local grid and will have to bring their own high voltage lines with them, as Amtrak does on the Northeast Corridor from Washington DC to New Haven Connecticut. This will require new electrical maintenance work crews at the railroads, with supporting infrastructure, hired and built from scratch. One innovative alternative is to use the existing railroad ROWs as electrical transmission corridors and have electrical utilities sell “Power at the Wire” to the railroads, if the railroads prefer that option. What would be a headache and a problem to the railroads - providing both high and medium voltage transmission along their ROW - is a scarce and valuable asset to the electric utilities. The utilities will deal with one landowner instead of 10,000, two or three years to build instead of twelve years: a new customer immediately underneath their wires and special tax and financing incentives. The railroads can chose to go into the electrical transmission business if they so wish, or just supply their own needs, or buy “power at the wire” and let someone else perform their core competency while the railroads do theirs. I would suggest both HV AC and HV DC transmission in many corridors, with HV DC being the long haul, high volume (only 5% loss per 1,000 miles) transmission and HV AC being the regional feeder and the feeder to the trolley wire. A secondary benefit of these new transmission corridors will be to provide new markets for renewable, especially wind generated, electricity. In particular, HV DC could supply markets that are over 1,000 miles away. Rail spur lines could also serve as sites for long rows of wind turbines. Today, the size of wind turbines is often limited by the capacity of local roads and bridges to support the large cranes involved, even though “larger and taller” is better in wind turbine economics. Rail mounted or rail delivered cranes to a series of wind turbines could potentially install 5 MW wind turbines now seen only at sea. Rail spurs always connect to main line railroads and the HV transmission on these main lines could ship power to markets in distant cities and states. If we wants significant improvements to our nations electrical grid within a decade, to support a more reliable grid and more renewable generation, electrified rail corridors are the best, and perhaps the only, hope.

#### Electrified rail sparks transition to renewables and reduces GHG’s

Drake 8, Alan, consulting engineer, “Multiple Birds-One Silver BB: A synergistic set of solutions focused on Electrified Railroads, 7/15/08, http://www.theoildrum.com/node/4301 Accessed: 6/26/12

Electrified railroads would use 2.37% of US electrical generation (about as much as France today) if all truck freight was shifted to electrified rail, and all rail was electrified. A more realistic (very successful) rail electrification program could use 1% of US electricity in a decade and more in later years. In 2006, the USA generated 4,065 TWh. Translating 2,552,000 barrels/day for trucks to electricity (using 18 : 1 ratio) and 231,000 barrels/day (2.6 : 1 ratio) gives 88.5 and 8 TWh respectively. This is 2.37% of US electrical generation if all truck freight was shifted to electrified rail, and all rail was electrified. Adjust downward from 100% of truck to rail and 100% of rail electrified and the USA would be very well served if an additional 1% of US electrical demand went to electrified rail. Today, 0.19% of US electricity goes to transportation - enough to run New York City subways, Amtrak’s Northeast Corridor, Long Island Railroad, subways in Chicago, Washington DC, Philadelphia, Boston and elsewhere, as well all Light Rail and streetcar systems. Modern main line locomotives are diesel-electric. A small (2 to 5 MW) diesel generator is coupled with an electric motor for traction power. Such small diesel generators are only used on small islands and for emergency generators because of their low efficiency and high cost for fuel and maintenance. The overall efficiency of diesel-electric locomotives (99+% of US locomotives) is slightly more than 2.6 BTUs of diesel generating 1 BTU of electricity. Both diesel-electric and all electric locomotives use an electric motor as the final drive. Modern electric locomotives can regenerate power during braking, feeding electricity back into the grid, an energy savings that diesel electrics put into waste heat. Gil Carmichael, former head of the Federal Railroad Administration, has stated that unit trains of double stack containers with diesel-electric locomotives are nine times as efficient as trucks in transporting freight. If one adjusts for less than ideal circumstances (such as more miles A to B by rail than by truck, some less efficient roll on-roll off trailers, some single stack containers) then 7:1 or 8:1 is more realistic. Regenerative braking in hilly terrain and built-up areas increases the diesel to electricity efficiency ratio from 2.6:1 to 3:1 (an industry rule of thumb). So seven or eight times 2.6 to 3.0 gives about 18 to 21:1 diesel to electricity BTU ratio (I’m rounding for national average) between diesel trucks and electrified rail. Overall, the USA grid loses about 10% of the electricity generated to transforming and transmission losses. Large industrial users, that use higher voltages, have optimized transmission and high efficiency transformers, are closer to 6% T&T losses. If railways improve the grid with more transmission lines, they would, in a sense, “make” electricity by reducing losses, so I have not allocated anything to T&T losses. Diesel also incurs energy losses in transportation before final use. There is no other widespread economic use for falling water, blowing wind, geothermal heat or nuclear heat except to make electricity. None of these sources release large scale greenhouse gases outside the natural cycle, Therefore, the relative efficiency of each is irrelevant; only maximizing their generation matters. Among the fossil fuels, natural gas emits 115 lbs of carbon dioxide for 1 million BTUs, oil (not diesel per se) 155 to 164 lbs and coal 205 to 227 lbs (some variance depending upon type). Locomotive diesels are in the 34% to 38% thermodynamic efficiency range. Modern super critical double reheat coal fired plants are in the 40% to 43% range, and combined cycle natural gas plants are 50% to 59% efficient. Combining the thermodynamics and emissions of modern coal plants vs. small diesels, and factoring in regenerative braking, I conclude that coal fired electric trains should emit as much CO2 as diesel-electric trains, unless the diesel comes from Canadian tar sands (a growing source with high CO2 emissions). All sources of electricity (except coal) are clear environmental winners for electrified railroads over diesel-electric trains. And even coal is better than diesel refined from Albertan tar sands. The impact of shifting freight from trucks to electrified rail (as opposed to diesel rail to electrified rail) is a massive environmental improvement (1:8+ improvement) with very dramatic reductions in greenhouse gases regardless of the source.

#### Federal funding for electric rail helps renewable energy development

Aki 8 (Helen, breakthrough generation fellow accredidation from US Green Building Council, “Railroads: Fast, clean and ELECTRIC”, 7/16/2008 http://thebreakthrough.org/blog/2008/07/railroads\_fast\_clean\_and\_elect.shtml Accessed: 7/1/12

A federal initiative promoting electrified rail could also nurture burgeoning renewable electricity markets. In urban areas, the electric rail would require electricity-providing substations every 20 or 30 miles. In remote areas, the rail would require its own high-voltage transmission lines. Their maintenance would provide hundreds of thousands or even millions of service jobs, and the electricity demand could provide novel opportunities for the installation of renewable electricity technologies, particularly wind. Drake excitedly suggests, Rail spur lines could also serve as sites for long rows of wind turbines. Today, the size of wind turbines is often limited by the capacity of local roads and bridges to support the large cranes involved, even though "larger and taller" is better in wind turbine economics. Rail mounted or rail delivered cranes to a series of wind turbines could potentially install 5 MW wind turbines now seen only at sea. Interestingly, Drake is disparaging of high-speed rail initiatives, asserting that there is not enough passenger demand to justify the installation of high-speed or semi-high speed rail over long distances. High-speed rails are greatly inefficient users of energy: Energy consumption increases with the square of the speed, a 190 mph train will use 3 times as much energy as a 110 mph train, a 220 mph train 4 times as much. The USA is not France: we simply cannot afford the "best" service in this generation and we do not have the energy to waste on maximum speed. However, Drake allows, high speed rails could provide both passenger transportation and serve as express freight lines. For example, fresh produce needs to be transported quickly, and the high speed rail could fill that important role. Think about it: even the average domestically-grown tomato travels over 1500 miles to make it into a sandwich (so reads the "[foodometer](http://www.youtube.com/watch?v=p4RCyxgz97g&e))"). Dependence on foreign oil, and oil in general, makes it more expensive for us to get around. Likewise, it imperils the journey of tomatoes and other vital goods everywhere. Electrifying existing rails, and committing large-scale federal investment to building and maintaining electric rail infrastructure, is a matter of national security. The California High-Speed Rail is an inspiring example of electric transportation progress. But electric rail on a national scale is a vital step towards maintaining economic and social security, and international competitiveness. Drake points out an example of a fundamental barrier which must be broken through before a large-scale, federal electric rail program can be initiated: The traditional reason/excuse given by US railroads for not electrifying is that the electrification infrastructure will be subject to heavy property taxes, and railroad diesel is tax free. This is an obstacle not faced by other national railroads, most of which have electrified.

#### Plan Sparks Shift to Renewables—Empirical Evidence All Over Europe

Margot 9

(Delphine, Head of Union of International Railways, “Running Railways on Renewables”, 11/27/2009 http://www.traintocopenhagen.com/spip.php?article89 Accessed:7/1/12

In an article called a Path to Sustainable Energy by 2030 published in Scientific American this November the authors show how wind, water and solar technologies can provide all of the world’s energy, eliminating all fossil fuels. Railway companies use large quantities of energy. Some companies generate their own energy and almost all railways organisations have the power to influence their energy mix due to being major purchasers of energy. In some countries it is also possible to opt for a ’green’ tariff or supply, directly influencing how their energy is generated. While changing the source of energy to renewables is a crucial component of meeting CO2 emission reduction targets, there are also other technical and social changes that reduce energy demand. During our journey from Kyoto to Copenhagen we were interested to learn first hand about the energy mix used by the different rail companies and their strategies for reducing dependence on fossil fuels. We were also interested in learning about technological innovations and the strategies being used to persuade transport users to shift mode to railway use. Our enquiries were structured to some extent by the recent report commissioned and published by UIC, This report objective is to identify the emission reduction potential of rail for society. It discusses amongst other factors investment, modal shift, and energy efficiency. It also sets out how the railway sector can create a sound basis for decision-making by demonstrating a process for analysing the carbon use embedded within transportation. In Japan rail is electrified. Electricity is provided by a single state-based supplier and currently around 15% of Japans electricity comes from renewables and nuclear power. Russian railways is also electrified. During a meeting we had in Russia, the sustainability manager for the central Siberian railways in Irkutsk, we learnt that this region of Russian railways gets it’s energy from hydro power. We were told that this region gets all its power from hydro-electricity and as this is their sole supply of energy so the regions railways already have a low carbon footprint. Her greatest environmental concern was rather to see through a regional programme of investment in water purification to deal with the waste-water produced when train-tankers and other equipment are cleaned. Internationally, strategies for increasing the energy efficiency of rail can be categorised. Electrification is the most important category and a recent analysis from the International Energy Authority shows there is still some way to go towards a goal of 100% electrification of the world’s railways. Electrification offers reductions in emissions over diesel-powered trains when the electricity is sourced from sustainable energy supplies, globally however there are significant differences in moves to renewable energy supply. The impact of increasing renewable energy sources in electricity generation on rail emissions can be clearly shown.

Swedish Rail, Statens järnvägars (SJ), which operates only electrically powered trains have taken the step of purchasing 100% renewable energy from hydroelectric and wind-powered sources. The positive impact on emissions reductions is illustrated by the journey between Stockholm and Gothenburg, on which an SJ train can carry up to 300 passengers and now emits only 400g of CO2, compared to a previous average of 44.5kg – a reduction of over 99%. In Spain, the rail operator Renfe is the biggest consumer of electricity, and increasing the percentage of renewable energy in the national energy mix from 18% to 31% contributed to a 43% reduction in CO2 emissions per Kwh in the operation of the rail sector.

### Electrification Solves Climate

#### Rail Electrification Infrastructure Solves the Largest Growing Segment of Climate Emissions

The North American Steel Interstate Coalition ‘10

“Slowing Climate Change.” <http://steelinterstate.org/topics/slowing-climate-change>, 2010.

Evidentiary experience of prevailing negative consequences of Climate Change is mounting. The fallout from a changing global climate have even been well documented by scientists. Here's a primer on climate change agents. An unstable environment with millions of displaced people would be a threat to global security. Heavy Trucks are the Nation's Fastest Growing Source of Greenhouse Gas Emissions In the U.S., the transportation sector is the second largest contributor to greenhouse gases. From 1990 to 2006, "Transportation greenhouse gas [GHG] emissions increased 27 percent, accounting for almost one-half of the increase in total U.S. GHG emissions for the period.[Transportation's Role in Reducing U.S. Greenhouse Gas Emissions: Volume 1, Synthesis Report to Congress, U.S. Department of Transportation, April, 2010, p. ES-3.] Since 1990, GHG emissions from medium and heavy-duty trucks have increased 77 percent, growing at three times the rate of emissions from light-duty vehicles." The Pew Center on Global Climate Change confirms, that heavy trucks are causing big increases in transportation greenhouse gas emission growth rates. Despite a 42 percent increase [projected between 2007-2030] in VMT [Vehicle Miles Traveled is a measurement of transportation growth patterns] light-duty vehicle GHG emissions are projected to decline nearly 12 percent, in response to expected increases in fuel economy from corporate average fuel economy (CAFE) regulations, advanced technologies, and alternative fuels. Freight trucks, on the other hand, show a projected 20 percent increase in emissions, even though freight truck VMT grows at a similar rate to light-duty vehicles. Comparing transportation modes, the share of GHG emissions from freight trucks is increasing faster than any other mode. [U.S. DOT, op. cit., pg. ES-2-26.] At the state level, research by the Tennessee Department of Transportation (TDOT) confirms growth in heavy truck freight traffic is faster than all other vehicles in the transportation sector. Measurement of transportation growth is measured in Vehicle Miles Traveled (VMT). Annual VMT growth for heavy-duty trucks in Tennessee is not only the highest in the transportation sector--it outstrips all other classes of vehicles by 50%. It is important to recall here that the impact of a tractor trailer mile is much greater than that of a "light-duty gasoline vehicle" or passenger car. Big trucks are far less fuel-efficient than cars; the U.S. fleet of tractor-trailers average about five or six MPG (miles per gallon).[Kodjak, D., Policy discussion-heavy duty truck fuel economy, National Commission on Energy Policy, 2004.] And these trucks produce GHGs far in excess of their share of VMT. With the national auto fleet average of about 28 MPG,[MSNBC staff and news reports, Obama unveils mpg rule, gets broad support, 5-19-09] one heavy truck mile is the rough equivalent of four car miles, though diesel engines have a small advantage over gasoline motors of the same size in overall GHG emissions.[U.S. Energy Information Agency,[U.S. Energy Information Agency, Light-Duty Diesel Vehicles: Efficiency and Emissions Attributes and Market Issues, Report #: SR/OIAF(2009)02 February 2009] The high VMT growth rate of tractor trailers makes a very large contribution to GHG growth in Tennessee and in the U.S.

In the chart, above, you can see that the transportation sector in Tennessee is by far the fastest growing source of CO2 emissions compared to all other economic sectors. That growth in CO2 emissions is expected to accelerate over the 2005-2025 period. In the chart below, you can see that Tennessee is not that different from the U.S. in its distribution of CO2 emission sources.

A 2009 Millennium Institute study, [see first pdf in “Related Resource” column on right] modeled a nationwide, electrified, inter-city rail system (similar to the Steel Interstate System) and determined the U.S. GHG reduction if such a system was implemented, along with the game-changing national investments in urban transit and renewable energy. The study abstract states, Several policy scenarios were modeled with constrained oil supply using Millennium Institute’s T21-USA model. The most positive result by every significant metric (GDP, greenhouse gas emissions, oil used) came from the combination of the two most environmentally positive policies: a massive push for electrified rail transportation (inter-city railroads and Urban Rail) coupled with a massive push for renewable energy, to be completed by 2030. With an estimated total investment of $250-500 billion in inter-city railroad lines Non-Oil Transportation could supplant most inter-city truck freight and unspecified modal share of passenger service. Up to $60 billion/year ($1.2 trillion over 20 years), spent cost effectively on Urban Rail, should allow for 28% annual growth (not compounded) in urban passenger-miles on Non-Oil Transportation. These two investments create an 11% larger GDP, only 4% increase in Greenhouse Gas Emissions and a 6% reduction in oil consumption already in 2030 versus a strictly market based reaction. Adding renewable energy improved the results to GDP +13%, GHG -38% and oil consumption -22%. The report concludes: A new paradigm appears to be evolving from this work. Public policy goals that were once considered contradictory can be, in fact, complementary. The best economic policy can also be the best energy policy, as well as the best environmental policy and best national security policy already in the short and medium term, when considering an oil constrained scenario. Previously competing interests and stakeholders could find a common policy to unite behind for quite disparate reasons and with fundamentally different priorities.[Drake, A., Bassai, A., Tennyson, E., Herren, H., Evaluating the Creation of a Parallel Non-Oil Transportation System in an Oil-Constrained Future, Millennium Institute, January, 2009.] Placing into a broader perspective the implications of fuel-savings and, consequently, GHG emission savings, the Steel Interstate model would accomplish, a lead researcher for the Millennium Institute study, Alan Drake, asserts, Train photo credit: Dave Foster This driver is rested and ready from his ride in a sleeper as trucks roll off a "truck ferry" train in Freiburg, Germany Transferring 85% of truck freight to rail, and electrifying half [about 35,000 corridor miles] of US railroads, which the author considers to be possible with a large enough investment (see Appendix Four), would save 2.3 to 2.4 million barrels/day. That is 12% of USA oil used today for all purposes, not just transportation. This dwarfs any other [oil-conservation option] being actively discussed that can be implemented quickly. And best yet, no new technology is required. This analysis shows that the major oil savings are in transferring freight from trucks to electrified rail. Electrified rail passenger service is an added, but unspecified, bonus.[Drake, A., Multiple Birds – One Silver BB: A synergistic set of solutions to multiple issues focused on Electrified Railroads, The Oil Drum] Higher speed, intermodal, electric, freight rail is achievable using off-the-shelf-technology, improved, and electrified rail infrastructure in the U.S. Whole truck ferries are in use in other parts of the world. Even if conventional energy sources power the Steel Interstate instead of renewable energies, just one unit of energy from the grid would require 20 units of diesel energy in trucks to move the same load. Even a standard diesel-powered railroad is substantially more efficient than over-the-road trucking. Trains waste less energy than trucks because they encounter less friction than truck tires on pavement. Diesel locomotive engines run electrical generators that run electric motors at the wheels. Moving inter-city trucking to a diesel-powered rail system would save the economy $91.56 per ton of GHG emissions avoided. Imagine how many more tons of GHG emissions could be avoided with a super-efficient, electric Steel Interstate, powered by renewable energy. This kind of transportation system is not just something we can do with off-the-shelf technology, it is something we must do! Remember, burning fuel more efficiently means that less fuel is needed to produce the energy we need. The less we burn, the less toxic fumes and greenhouse gases in the exhaust. Large locomotive diesels are cleaner than motor-vehicle engines. Power plants are cleaner than diesel engines. Wind and other carbon-free sources are cleanest of all. Electrified trains can run on electricity from any source as we develop wind, tidal, solar-thermal, photovoltaic and hydro sources, which produce no greenhouse gases at all. Rail Lines Can Foster Renewable Energy Transmission Railroad infrastructure offers the potential to transmit to markets electricity generated by windmills, solar energy installations, and other renewable energy generators in remote locations--such as off-shore on the Eastern Continental Shelf or the Great Plains, or the desert Southwest. Railroads can use of the renewable generation to power the North American Steel Interstate System. Though this is not appropriate everywhere, railroads are single-owner rights-of-way that offer opportunity for electric transmission where appropriate and crucial to green energy development. The Steel Interstate: "The best economic policy can also be the best energy policy, as well as the best environmental policy and the best national security policy" The most cost-effective action to reduce GHGs that the nation can undertake is to build and operate the Steel Interstate System--electrified trains, which will carry the freight that inter-city tractor trailers now haul. When the electricity to power Steel Interstate trains is supplied by coupling the project with a national energy efficiency program or by developing non-combustion, renewable energy sources--wind turbines, solar and solar-thermal, tides and small scale hydro--the rail portion of this intermodal system operates almost free of GHG emissions. Railroads could also run on nuclear-generated energy, but we recommend the clean renewable energy sources because nuclear poses greater risk than all other sources. Policy, climate and ecology writer Susan Kraemer, listing the various government plans analyzed by the Center for Climate Strategies to reduce GHG emissions, reports that many of the plans would actually turn a profit. Diverting mid- and long-distance truck freight to a diesel locomotive operated train is the #1 most cost-effective of all is the Steel Interstate--electrified trains operating on renewable energy.

### Plan is Zero Emissions

#### Electrification of Freight Rail Infrastructure Would Build Wind Power Facilities That Create Zero Emissions—Also Solves All Wind Power Inefficiencies

Longman ‘9

Phillip Longman is a senior fellow at the New America Foundation. Back on Tracks

A nineteenth-century technology could be the solution to our twenty-first-century problems. <http://www.washingtonmonthly.com/features/2009/0901.longman.html#Byline>, Jan/Feb

Once kinks like these have been ironed out of the system, we can focus on the big picture—most importantly the electrification of America’s major rail lines. Today, most other industrial countries make extensive use of electric locomotives, and for good reason. They are two and a half to three times more efficient than diesels, more powerful, and cheaper to maintain. They also last longer, accelerate faster, and have much higher top speeds. Trains carrying containers at 100 miles per hour are more than possible. 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 that when electric locomotives brake, they generate 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 twenty times more fuel efficient than trucks. Rail electrification also offers significant opportunities for zero-emission freight and passenger transportation. Heirs to the Milwaukee Road’s hydropowered line could traverse the Great Plains, powered by the region’s wind farms. 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 rights-of-way to utilities in exchange for access to discounted wind power for its trains.

### Electrification Solves Largest Proximate Cause of All Major Impacts

#### Electrified rail is the shit-best environmental, economic, and environmental policy-solves every major policy issue

Drake 8, Alan, consulting engineer, “Multiple Birds-One Silver BB: A synergistic set of solutions focused on Electrified Railroads, 7/15/08, http://www.theoildrum.com/node/4301 Accessed: 6/26/12

An as yet unpublished analysis by the Millennium Institute using their T21 model strongly implies that a combined policy of a maximum push for renewable energy with a maximum push for electrified transportation (railroads and Urban Rail) gives the largest GDP, the largest reduction in Greenhouse Gases and the Largest reduction in oil consumption over decade and longer time horizons, The best Economic Policy is the best Environmental Policy and the best Energy Policy ! And such a policy combination also has extremely positive National Defense implications. With some justification it could also be called the best National Defense Policy as well. Just two major policy initiatives, renewable energy and electrified rail (Urban & freight) address every major public policy conundrum. If pursued with extreme vigor, these two policies, combined, are better than every other examined alternative. One interesting observation is the positive effects of these two policies were not simply additive but multiplicative. There is a subtle but strong synergy between these two policies for the economy, energy and the environment. The limitations of the Millennium Institute project did not allow for modeling increased transportation bicycling, but there is no doubt that any increase in bicycle modal share can only improve the results by every metric.

### Electrification Solves Road Damage

####  **Electrification of rail and transition reduces 99% of damage to roads-also have 15% greater capacity than diesel trains**

Drake 8, Alan, consulting engineer, “Multiple Birds-One Silver BB: A synergistic set of solutions focused on Electrified Railroads, 7/15/08, http://www.theoildrum.com/node/4301 Accessed: 6/26/12

Electric locomotives can accelerate and brake faster because electric motors can be (and are) routinely run above their rated power for up to an hour without damage. The on-board diesel generator of a diesel-electric locomotive cannot supply this surge of power, but a trolley wire can. This extra acceleration and braking creates a 15% increase in track capacity for freight trains, as well as faster transit speeds. In commuter train service, travel times are typically cut by 15% with electrification, which reduces labor and rolling stock costs and will increase ridership. All of these factors will reduce local subsidies for commuter rail, even at increased levels of service. SBB (Swiss Rail) will operate up to 300 trains/day, at mixed speeds of 110 to 240 kph (66 to 150 mph) and with trains up to 1.5 km long, through a 58 km dual bore tunnel. Such volumes would be impossible without electrification. Few dual track US rail lines, operating with diesel-electric locomotives, can handle more than 100 trains/day. Adding capacity for “rubber tires” (trucks, cars and SUVs) costs more for each additional unit (in capital or congestion costs). Adding just one lane to a freeway can cost more than the original freeway, even after adjusting for inflation. The more we use rubber tires, the more the average cost rises - a negative cost elasticity of demand. On the other hand, rail, both freight and urban, has a positive cost elasticity of demand, Adding additional capacity lowers average costs instead of raising them, since the marginal cost of new capacity is typically lower than the initial cost per unit of capacity. Electrification by itself increases rail capacity by roughly 15% due to faster acceleration and braking and costs much less than 15% of a new rail line. In simplest form, a double track railroad can carry 3x to 4x the freight of a single track railroad, but adding back a track torn up in the 1960s will not double costs. Some infrastructure, such as ROW and signals, can be used for either one or two tracks. Improved signals are an even more cost effective means of adding capacity than adding track. Not only will double tracking dramatically increase capacity, it will also increase speed and reliability since trains will not have to queue for their turn or wait on a passing siding as trains come the opposite direction on a single track. This lowers labor, rolling stock and customer costs (the costs of slow transit and uncertainty about delivery dates). Road damage is roughly proportional to the fourth power of the axle load. A 20,000 lb axle causes 16 times as much damage as a 10,000 axle, and 160,000 times as much damage as a 1,000 lb axle (wider tires mitigate the effect slightly). The net result is that 99% of the traffic damage to roads and highways comes from trucks and buses and far exceeds any fuel taxes paid. Removing as many trucks as possible (and shifting to Urban Rail with smaller feeder buses) is the best hope for keeping road maintenance affordable. A massive capital spending program on long lived infrastructure that eliminates oil use is a nearly ideal economic stimulus. The majority of spending should be for domestic goods and services. Rail freight is also significantly safer than heavy truck freight per ton-mile. Another economic, and human, benefit that could save thousands of lives each year. Electric rail should generate significantly less pollution, even after accounting for electrical generation. The cost of electricity BTUs are much lower than the cost of diesel BTUs today, and are likely to stay cheaper and more stable. The only significant imports of electricity are from Canadian hydroelectric projects, which are superior to Middle Eastern and Venezuelan oil imports in several ways.

### Electrification Solves Oil Dependence

#### Switching to electrified rail solves largest proximate cause of foreign oil dependence: implementation only takes 6 years

Drake 8, Alan, consulting engineer, “Multiple Birds-One Silver BB: A synergistic set of solutions focused on Electrified Railroads, 7/15/08, http://www.theoildrum.com/node/4301 Accessed: 6/26/12

Oil can be saved from the diesel that railroads use today (231,000 barrels/day in 2006) and from truck freight (2,552,000 barrels/day in 2006) by switching to electrified rail. Trucks carry about a quarter fewer ton-miles than rail, but with 11 times the oil. The USA has 177,000 miles of railroads, with the Department of Defense classifying 32,421 miles as strategic (STRACNET). These selected rail lines correlate closely, but not exactly, with what are considered “main line” railroads. DoD only selected one rail line when two main lines parallel and a few main lines are not considered strategic. 36,000 miles should cover all of the main lines. The Pareto Principle (also known as the 80/20 rule) suggests that the 36,000 miles of main line railroad should carry 80% of the railroad ton-miles, and burn 80% of the fuel (there being no electrified freight lines in the USA), or 185,000 barrels/day. Electrifying 36,000 miles of US railroads could take as little as six years with “Maximum Commercial Urgency” (see Appendix Two). The Russians electrified the Trans-Siberian Railroad in 2002 and to the Arctic port of Murmansk in 2005, so there are no technical obstacles to electrifying American railroads. [See Appendix Three for an overview of foreign electrified rail lines]. However, this calculation of 185,000 barrels of oil/day saved seriously underestimates the fuel saving potential, especially in an oil constrained future, Transferring just 8% of the truck ton-miles to electrified rail would save another 204,000 barrel/day. Transferring half would save 1,276,000 barrels/day, plus the 185,000 barrels/day for 1,461,000 barrels/day saved (roughly equal to ANWR at its peak, but electrified rail does not deplete - which ANWR inevitably will). Transferring 85% of truck freight to rail, and electrifying half of US railroads, which the author considers to be possible with a large enough investment (see Appendix Four), would save 2.3 to 2.4 million barrels/day. That is 12% of USA oil used today for all purposes, not just transportation. This dwarfs any other “silver BB” being actively discussed that can be implemented quickly. And best yet, no new technology is required. This analysis shows that the major oil savings are in transferring freight from trucks to electrified rail. Electrified rail passenger service is an added, but unspecified, bonus.

#### Electrification Solves the U.S. from oil dependence

Drake 7 (Alan, consulting engineer, “Ready-to-Go Urban Rail Projects as a Medium-Term Response to America’s Oil Problems”, May 2007, http://www.lightrailnow.org/features/f\_lrt\_2007-04a.htm Accessed: 6/26/12

The United States of America is addicted to oil. And oil prices keep climbing, plus future availability is a very serious concern. What if Iran is bombed, Saudi Arabia has a revolution? What about Chavez in Venezuela, Nigerian and Iraqi civil wars, more hurricanes, or any other major oil supply interruption? And what if world oil production peaks and starts declining? World oil exports will shrink even faster than world oil production. Half the world's oil production is used in the nation of production; the balance is exported. In a shrinking – or even flat – oil production world, domestic demand will still grow in many oil exporting nations, shrinking the volume of available exports. A serious and prolonged crunch is in store for the United States if world oil production just fails to increase steadily. What can be done, and preferably done quickly, to save significant amounts of gasoline and provide a non-oil alternative for many millions of American commuters? A non-oil transportation alternative would be especially useful during a prolonged oil supply interruption or shortfall, when the Strategic Petroleum Reserve will simply not be enough. One very viable alternative is to build much more urban rail – in particular, electrified urban rail – and build it quickly. Such an approach also can preserve the quality of urban functioning while ensuring adequate mobility. In the USA, efforts to develop an adequate safety net of urban rail has been starved for funding at the federal level for decades – and even more so in recent years. One way the Federal Transit Administration rations out the relatively few dollars available is by slowing down all projects as much as possible. Thus it takes decades to build out new urban rail systems, one slow project after another. The French, with a much smaller population but much greater determination to be more energy self-reliant, are building as much new urban rail as the United States – and all running on electricity. Amazingly, it takes as little as three or four years from a Oui in Paris to a ribbon-cutting. In contrast, the infamous American bureaucracy drags projects out for unnecessary years. (A can-do, just-solve-the-problem French attitude vs. a stodgy, red-tape-focused American policy: is there something wrong with this picture?) I have developed a list of urban rail projects in the United States that are close to "ready-to-go". In most cases, specific routes have been determined, some engineering has been done, and, for some projects, an Environmental impact Statement (EIS) has been prepared (although this may need updating). "If 90% federal funding (the same percentage of federal funding that built the interstate Highway system) were available, all of the projects listed below could, and likely would, break ground within 12 to 36 months. Completion dates would vary, depending upon the project, but a significant fraction of US oil consumption could be diverted to very high mileage electrified rail within a decade (see <http://strickland.ca/efficiency.html>). And many Americans will have a non-oil alternative to get to work. Reducing total US oil consumption by 4% (transportation oil use by 6%) is a reasonable goal in a dozen years just by focusing on building urban rail. These oil savings are comparable to an optimistic estimate of Arctic National Wildlife Refuge (ANWR) oil production – but unlike oil production, these savings will grow, and not deplete. Of course, other urban rail projects should be developed as this first phase is under construction, and coordinated with other oil-saving initiatives. An urban rail development program on this scale would, of course, create a vast building boom with spot shortages of critical resources. However, anticipation of continued demand should bring new supplies and suppliers into the market without undue delays or cost increases. Greater volumes in vehicles, rail, transformers and other items should bring efficiencies of scale and lower costs. Standardized engineering plans (such as exist for roads) could also bring best practices at lower costs. Urban rail projects that could be included in a Phase One program are listed below. These include electric light rail transit systems, commuter rail [regional passenger rail], systems, and subway-elevated or metro systems. A rough "horseback" estimate is that these projects would cost approximately $135 to $175 billion to complete

#### Electrification Key to Solve Coming Petroleum Supply Crunch

SIC 10 (Steel Interstate coalition, proponents for rail innovation, “Beyond Peak-Oil- The Path to oil-free mobility”, 2010, http://steelinterstate.org/topics/beyond-peak-oil-–-path-oil-free-mobility Accessed:6/28/12

To keep America on the move and our defenses at a high state of readiness, there is no better way to substitute for liquid petroleum than through electrification. Other commonly mentioned methods, such as shale oil, tar sands, and coal liquefaction face production bottlenecks, cost barriers, or environmental problems, or all three, which make them unsuitable candidates for widespread oil substitution. 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 unavailable 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. So the Steel Interstate System would readily move people and products, soldiers and material and keep the U.S., and it’s Canadian and Mexican neighbors, strong and secure by meeting both the food and resource needs of our peoples, and the training and deployment capabilities of our militaries.

#### Plans causes electric shift, Solves Oil Dependence

Drake 10 (Alan, consulting engineer, “an American Citizen’s Guide to an Oil-Free Economy”, 10/27/10, http://www.energybulletin.net/stories/2010-10-27/book-excerpt-american-citizen’s-guide-oil-free-economy-chapter-1-electrified-and- Accessed: 6/27/12

The manifold benefits of switching from trucking to electrified rail are so much larger than the costs that a “fair” allocation of costs is not required. It is as if four people could each contribute a quarter and each would walk away with a five dollar bill (a 20 to 1 return). Or one of the four contributes $1 and the others nothing, and they all still walk away with a $5 bill. The “chump” still makes $4. Warren Buffett (BNSF Railroad is his largest single investment) and Bill Gates (30% of his non-Microsoft stock portfolio is in CN Railroad) are hardly charity cases. Their investments may reflect the same opportunity that I see. However, the market valuation of all seven major North American railroads is just $151 billion, less than one AIG, and just half of the market value of Exxon-Mobil. The railroads clearly do not have the financial strength and risk appetite to build this proposal, unaided in the time required. They have stated that they can invest a maximum of $142 billion over twenty years in new infrastructure. However, the initiative, innovation and adaptability of good private management is required in order to capture the bulk of current truck traffic. The national interest is very well served by electrifying, expanding and improving our railroads as quickly as possible. All parties should contribute but the ratios of contribution and direct benefits are subject to negotiation and compromise. A little known potential revenue source is discussed in Appendix F. One historic example is that US Government freight was shipped at half price until after WW II as a quid pro quo for giving the railroads the land to build the Trans-continental railroads in the 19th Century - another major rail project that benefited the entire nation but required government assistance. We spent a half trillion dollars (2008 adjusted) or 3 AIGs and built 46,876 miles of Interstate Highways under the “National Interstate and Defense Highways Act”. The case for, and benefits of electrified and improved railroads are significantly greater than they ever were for Interstate Highways.

Bottom Line Benefits – Modeling Chapter 1, "Electrified Railroads" and Chapter 2, "Urban Rail" of A American Citizen’s Guide to an Oil-Free Economy plus a major push for renewable energy (ACORE) resulted in the following results in twenty years (vs. the alternative Business as Usual in an oil constrained environment). GDP +13% CO2 -38% Oil Use -22% (would be lower but higher GDP increases oil demand) Employment +4% (The US economy looks less like a 3rd World economy)

The increased GDP alone could justify investing over a dozen AIGs over twenty years.

The -38% reduction in CO2 is close to the -50% reduction called for by notable Climate Scientists and additional doable steps such as conservation could take us to over -50%.

The Millennium Institute modeling strongly suggests that the USA, with Business as Usual, is heading towards an economy characteristic of 3rd World economies. Subsequent events do not contradict the model run in 2007. Halting the slide towards becoming a Third World type economy (characterized by a few rich and most struggling to get by with lower GDP) has very positive social and democratic benefits, as well as economic ones. Investing in a high efficiency domestic transportation system is an essential step in changing our economic course for the better. Various people, with different perspectives and priorities, can unite in supporting oil liberation. For example, those that dismiss climate change can enthusiastically support the economic, energy and National Security benefits and accept that reducing carbon emissions “won’t hurt”. Oil Liberation is good for what ails us !

Electrification solves for oil vulnerability
Drake 6/6, Alan S., an engineer, former accountant, and professional researcher based in New Orleans. http://oilfreetransport.blogspot.com/2012/06/overlooked-existential-threat-and.html
The United States clearly faces a major structural problem and strategic vulnerability with oil. However, there are medium term structural solutions that address the core of the problem. In a rational rationing scheme during a severe oil shortage, diesel powered railroads would rank with the military, agriculture, public safety agencies, utilities and healthcare as among the highest priority users. Yet, railroads need not be large volume diesel consumers - regardless of the volume of freight and people carried. “We” can electrify the main rail lines and busiest branch lines and provide cross country oil free transportation for almost all of our freight and some of the demand for personal travel.

#### Electrified rail blunts oil shocks

Drake 6/6, Alan S., an engineer, former accountant, and professional researcher based in New Orleans. <http://oilfreetransport.blogspot.com/2012/06/overlooked-existential-threat-and.html>
Transportation is one of the basic factors of production. Dramatically reducing, and stabilizing, the cost of transportation will have positive ripple effects throughout the economy.  An electrified and expanded rail system will take the core of the US economy several steps back from slow deterioration, or collapse in a severe oil supply crisis. Even if the balance of the economy, still dependent on oil, is progressively stressed by ever higher oil prices and occasional or prolonged oil shortages. We will have a good and stable core in an otherwise stressed economy. Much of the infrastructure# of an electrified and expanded rail system will last almost a century or more and the economic benefits will quite easily justify renewal – a problem today for our highways where fuel taxes pay less than half the cost of their maintenance. The rest of society picks up the balance - subsidizing road users.

Electrified Freight rail more cost effective than trucking
Drake 6/6, Alan S., an engineer, former accountant, and professional researcher based in New Orleans. <http://oilfreetransport.blogspot.com/2012/06/overlooked-existential-threat-and.html>
An interesting insight is that the more roads are used, the more expensive they become because the marginal cost of more road capacity is so high. The opposite is true of rail. The more rail is used, the faster and cheaper it becomes with appropriate infrastructure investments. “Faster and cheaper” transportation is beneficial for all sectors of the economy. Trucks would have to buy diesel for 18 cents/gallon to compete with the fuel cost of electrified, double stack (two containers stacked on top of each other) trains. Shifting freight from trucks to electrified double stack trains trades 20 BTUs of refined diesel for 1 BTU of electricity. A trade that has extremely positive strategic, economic, environmental and balance of trade implications.

### Electrification Infrastructure Solves Efficiency

Electrification Infrastructure Investment Solves Efficiency Blocks
Drake 6/6, Alan S., an engineer, former accountant, and professional researcher based in New Orleans. <http://oilfreetransport.blogspot.com/2012/06/overlooked-existential-threat-and.html>
Electrified railroads are an oil free alternative means of transportation that we can shift to as the oil based systems become progressively more stressed. Rail capacity will need to be expanded and speeded up to accept freight that travels on heavy trucks today. Rail lines can be speeded up and capacity increased with electrification (faster braking and acceleration), rail over rail bridges (overpasses instead of 4 way stops), better signals, longer and more sidings, increase clearances on more rail lines to allow double stack containers and install switches that allow trains to operate at higher speeds. The easiest to understand, and most effective, improvement is to turn single track lines with two way traffic into double track lines. This results in no delays waiting for tracks to clear of trains going the other way and much increased track capacity.

### Electrification Boosts Manufacturing Employment

#### Electrification Boosts Employment in Key Manufacturing Sectors

Longman ‘9

Phillip Longman is a senior fellow at the New America Foundation. Back on Tracks

A nineteenth-century technology could be the solution to our twenty-first-century problems. <http://www.washingtonmonthly.com/features/2009/0901.longman.html#Byline>, Jan/Feb

 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 autoworkers back to work. General Motors, until it sold off its Electro-Motive Division in 2005 to private investors, was long the nation’s dominant 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.

### Quick Solvency—Electrification in Six Years

#### Electrification can happen in six years-no new tech necessary

Drake 8, Alan, consulting engineer, “Multiple Birds-One Silver BB: A synergistic set of solutions focused on Electrified Railroads, 7/15/08, http://www.theoildrum.com/node/4301 Accessed: 6/26/12

How quickly can the USA Electrify our Railroads ? I contacted the premier US consultant I know of on this issue, John Schumann P.E. of LTK Engineering. He graciously gave me several hours of his time to work out a schedule for electrifying US railroads. We assumed Maximum Commercial Urgency, the maximum effort that people driven by the profit motive can sustain on large scale projects. War time efforts are a step above Maximum Commercial Urgency since national survival is clearly at stake (the development of tar sands in Alberta Canada is a contemporary example of Maximum Commercial Urgency). We agreed to five groups. Four would be run by the four major Class I railroads in the USA, Union Pacific, BN-SF, Norfolk Southern and CSX. Separate efforts by Kansas City Southern, the US divisions of Canadian National and Canadian Pacific, as well as Class II railroads such as Florida East Coast would be the equivalent of a fifth group. All five groups would make roughly equivalent efforts and try to create new electrification work teams at the rate of about eight teams/year/group, using a combination of in house labor and contracted labor. This is as fast as possible, within the boundaries of cost control (they would not be operating at war time urgency). Our conclusion was that the following is an aggressive but possible effort for railroad electrification. Year 1 – 0 (Design, Planning, Mobilization, Materials) Year 2 – 5 x 500 miles = 2,500 miles Year 3 – 5 x 1,000 miles = 5,000 miles Year 4 – 5 x 1,500 miles = 7.500 miles Year 5 – 5 x 2,000 miles = 10,000 miles Year 6 – 4.5 x 2,500 miles = 11,250 miles A total of 36,250 miles electrified in six years. The slight slowdown in the sixth year reflects a saturation of lines worth electrifying at Maximum Commercial Urgency. The low hanging fruit would have been picked.

Depending upon future oil prices and the efficiency of running an all-electric rather than mixed fuel railroad, the pace of electrification may slow after the main lines are electrified - or a prolonged oil emergency may compel further acceleration.

[Subsequent to our discussions, I discovered a never implemented 1979 contingency plan for British Rail that envisioned five teams electrifying 250 miles/year as a response to a prolonged oil emergency. This is 50 miles/year/team and we assumed 62.5 miles/year/team].

#### Full Electrification Within Six Years with Low Cost

Longman ‘9

Phillip Longman is a senior fellow at the New America Foundation. Back on Tracks

A nineteenth-century technology could be the solution to our twenty-first-century problems. <http://www.washingtonmonthly.com/features/2009/0901.longman.html#Byline>, Jan/Feb

Much of the electrification could start almost immediately. In the 1970s, the National Academy 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." A temporary fall in oil prices and an abundance of short-term thinking killed almost every last project, but we still have the 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 per mile—and 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 at a cost of around $72 billion. According to John Schumann, professional engineer at the rail transportation consulting firm LTK Engineering, completing such a project could take as little as six years.

### Federal Action is Key

#### Government Action Key—Investors Won’t Take Risks

Lothes 9 (Scott, , “The future of electrification on America’s freight railroads”, 11/2009, http://www.railsolution.org/uploads/PDF/TRAINSarticle11-09.pdf Accessed:6/28/12

Who will pay for this? Russia and China have nationalized rail systems that can draw on their entire country’s resources to fund infrastructure improvements. The same is true for railroads in Europe and Japan. Transportation researchers Zheng Wan and Xiang Liu, who have called for some deregulation of China’s railways, concede that the high initial costs of railway projects do not favor private investors, and thus “the government remains the main entity or agent that should provide funds for further rail- way construction.” American groups echo this sentiment, including the American Association of State Highway and Transportation Officials, which warns that if the federal government does not invest in rail improvements to meet rising traffic demands, it will pay even more in highway costs, traffic congestion, air pollution, and energy consumption. The argument against private investment is based largely on operating costs, however, and does not consider capacity, which could prove more important for electrification, as Harvard professor John R. Stilgoe predicts in his book “Train Time: Railroads and the Imminent Reshaping of the United States Landscape.” All other factors being equal, an electric railroad has significantly higher capacity than a diesel-powered line, as the electrics’ faster acceleration and braking increases capacity by roughly 15 percent.

#### USFG and railroad companies must cooperate- solves inefficiency

GAO 2009

(Government Accountability Office, April 2009, "Actions Have Been Taken to Enhance Security, but the Federal Strategy Can Be Strengthened and Security Efforts Better Monitored" http://www.gao.gov/assets/290/288753.pdf)

While federal and industry partners responsible for freight rail security have improved coordination by implementing several agreements that clarify roles and responsibilities, and TSA has taken steps to ensure that key stakeholders are included in coordination activities, the Department of Homeland Security can further enhance coordination activities by leveraging the resources of its other components. In addition, both federal and industry freight rail stakeholders have improved coordination by creating and participating in various information-sharing mechanisms, but FRA and TSA have not fully coordinated on some relevant inspection activities, which could potentially result in an inefficient use of already limited stakeholder resources.

#### Congressional Investment Vital to Solve Infrastructure Overcapacity

Schwartz 12

Jon, NY Times reporter, “Freight Train Late? Blame Chicago”, 5/7/12, http://www.nytimes.com/2012/05/08/us/chicago-train-congestion-slows-whole-country.html?pagewanted=all Accessed: 6/26/12

When it comes to rail traffic, Chicago is America’s speed bump. Chicago is the place where many of the nation’s trains grind to a halt, but a major construction project may speed things up. Above, a Metra maintenance center. William C. Thompson, a project manager, at a site described as Amtrak’s most congested intersection, the cause of many delays. David Grewe, a supervisor for Union Pacific Railroad, said the different rail companies had failed to coordinate in the past. Shippers complain that a load of freight can make its way from Los Angeles to Chicago in 48 hours, then take 30 hours to travel across the city. A recent trainload of sulfur took some 27 hours to pass through Chicago — an average speed of 1.13 miles per hour, or about a quarter the pace of many electric wheelchairs. With freight volume in the United States expected to grow by more than 80 percent in the next 20 years, delays are projected to only get worse. The underlying reasons for this sprawling traffic jam are complex, involving history, economics and a nation’s disinclination to improve its roads, bridges and rails. Six of the nation’s seven biggest railroads pass through the city, a testament to Chicago’s economic might when the rail lines were laid from the 1800s on. Today, a quarter of all rail traffic in the nation touches Chicago. Nearly half of what is known as intermodal rail traffic, the big steel boxes that can be carried aboard ships, trains or trucks, roll by or through this city. The slowdown involves more than freight. The other day, William C. Thompson, a project manager for the [Association of American Railroads](http://www.aar.org/), stood next to a crossroads of steel in the Englewood neighborhood pointing to a web of tracks used by freight trains and Amtrak passenger trains that intersected tracks for Metra, Chicago’s commuter rail. The commuter trains get to go first, he said, and so “Amtrak tells me they have more delays here than anywhere else in the system.” More delays than anywhere else in the Chicago area? No, he said. “In the entire United States.” Now, federal, state, local and industry officials are completing the early stages of a $3.2 billion project to untangle Chicago’s rail system — not just for its residents, who suffer commuter train delays and long waits in their cars at grade crossings, but for the rest of the nation as well. The program, called Create (an acronym for [Chicago Region Environmental and Transportation Efficiency Program](http://www.createprogram.org/)), is intended to replace 25 rail intersections with overpasses and underpasses that will smooth the flow of traffic for the 1,300 freight and passenger trains that muscle through the city each day, and to separate tracks now shared by freight and passenger trains at critical spots. Fifty miles of new track will link yards and create a second east-west route across the city, building redundancy into the overburdened system. Fourteen of the 70 projects have been completed so far, and 12 more are under way, including the $140 million “Englewood flyover,” or overpass. While much of the country’s attention in [transportation](http://topics.nytimes.com/top/reference/timestopics/subjects/t/transportation/index.html?inline=nyt-classifier) issues is focused on [high-speed rail](http://topics.nytimes.com/top/reference/timestopics/subjects/h/high_speed_rail_projects/index.html?inline=nyt-classifier) projects trumpeted by the Obama administration, Create is largely about bringing old-fashioned low-speed rail up to modern standards. Innovative financing combines federal, state and private money from various programs, including the federal stimulus packages. Create even uses some funds tied to high-speed rail, since many of the projects are being designed to accommodate those lines in the future. One of the biggest holdups for freight traffic is that Chicago’s crowded rails must also get hundreds of thousands of commuters to work and home mornings and evenings, and so by an agreement known as the Chicago Protocol, the shared tracks and intersections belong to passenger rail during rush hours. The progress of a few recent trains as measured by the railroads shows how the delays occur. Among them was a [coal](http://topics.nytimes.com/top/reference/timestopics/subjects/c/coal/index.html?inline=nyt-classifier) train traveling 1,100 miles east from the Powder River Basin in Wyoming. The train reached Chicago in 60 hours; its average speed, with delays for traffic control and a delivery schedule on the first leg, was 18 miles per hour. Within the “corral” of the greater Chicago area, the average speed dropped to 3.9 miles per hour, the pace of a rapid walk. It took more than 10 hours to move the 40 miles across the city. It had to stop completely on the outskirts of town during commuter rush hours and wait its turn at “interlockings” — go-slow rail intersections like the one at Englewood. Once outside Chicago, the train’s average leapt to 36 miles per hour. Some of the causes of delay might have seemed outdated in the 20th century, much less the 21st, like manual switches that engineers have to throw after their trains have passed. Create is replacing them with electronic switches and online traffic control networks, but until then engineers at some points have to get out of their cabins, walk the length of the train back to the switch — a mile or more — operate the switch, and then trudge back to their place at the head of the train before setting out again. Chicago had lived with its rail anachronisms and idiosyncrasies for decades, but everything fell apart in a 1999 blizzard that paralyzed the city’s rails and backed up train traffic across the United States for months. “The traffic just kept coming and coming and coming,” said David Grewe, a supervisor for Union Pacific Railroad. “We basically waited for the spring thaw.” The resulting plan to fix its rail problems started with efforts to reduce delays by improving coordination among the six freight rail companies, an effort that includes Mr. Grewe, as well as Metra and Amtrak. “You would have thought that coordination would have taken place in the past,” Mr. Grewe said. “Unfortunately, it didn’t.” Mr. Thompson, the rail association’s program manager for Create, said that building during a [recession](http://topics.nytimes.com/top/reference/timestopics/subjects/r/recession_and_depression/index.html?inline=nyt-classifier) had produced a bonus, as construction companies eager to get the work have come in under budget on every project. “It’s a very good time to be building infrastructure,” he said. With more than a dozen of the smaller projects in place, rail officials say they have already seen some reduction in delays, said Joe Shachter, director of public and intermodal transportation for the Illinois Department of Transportation, with bigger improvements to come. “The next two or three years in particular we think are going to show great advances,” he said. But the full benefits will be felt only if all of the projects can be completed, Mr. Thompson said: a knot of interrelated problems requires a network of solutions. And there lies a potentially larger problem than anything in the steel rails that snake across the city. While some of the financing for Create has come from private industry and state bonds, further progress depends almost entirely on the ability of Congress to pass transportation legislation. That legislation has historically been passed in a bipartisan manner. But Congress, eager to squeeze the budget and in continual disagreement about the nation’s priorities, has found itself repeatedly at an impasse over the current transportation bill. To Brian Imus, staff director of Illinois PIRG, a consumer group, “it seems like as much gridlock as we’ve got with our trains, it’s even worse in Washington, D.C.”

#### **Federal incentives key rail companies won’t switch because of property taxes and tax free diesel**

Drake 8, Alan, consulting engineer, “Multiple Birds-One Silver BB: A synergistic set of solutions focused on Electrified Railroads, 7/15/08, http://www.theoildrum.com/node/4301 Accessed: 6/26/12

The traditional reason/excuse given by US railroads for not electrifying is that the electrification infrastructure will be subject to heavy property taxes, and railroad diesel is tax free. This is an obstacle not faced by other national railroads, most of which have electrified (See Appendix Three). It appears that both the Interstate Commerce and Common Defense clauses of the US Constitution give the federal government the power to regulate local property taxes on interstate commerce common carriers. One approach is to give property tax exemptions on new infrastructure for a limited time. Perhaps a 30 year property tax exemption for electrification and capacity expansion infrastructure completed by 2010, with that exemption shrinking by three years for each additional calendar year. One possibility to assist local taxing jurisdictions would be to place a cap on their prospective losses for new infrastructure. Local taxing jurisdictions that lose more than, say, 0,3% of their revenues, could have the excess above 0.3% compensated by the federal government. Such a cap would dramatically cut the cost to the federal government. And once the property tax exemption expired, they would have new property to tax. There are many other possibilities.

### Plan Spills Over—Solves Transportation All Infrastructure

#### Large Scale Rail Infrastructure Investments Would Remake All U.S. Transportation Structure

ProgressiveRailroading ‘10

Nation needs 'ethical and sustainable' intermodal system, Carmichael says, [http://www.progressiverailroading.com/rail\_industry\_trends/news/Nation-needs-ethical-and-sustainable-intermodal-system-Carmichael-says--23702#](http://www.progressiverailroading.com/rail_industry_trends/news/Nation-needs-ethical-and-sustainable-intermodal-system-Carmichael-says--23702), June 29.

Gil Carmichael, founding chairman of the Intermodal Transportation Institute at the University of Denver and former Federal Railroad administrator, recently addressed more than 200 members of the Railway Industrial Clearance Association. By soliciting industry input, the Federal Railroad Administration (FRA) has taken “a significant step toward creating a new national rail plan,” Carmichael said. However, the FRA could further address the needs of the globalized intermodal transportation infrastructure, he believes. “Ten years into the 21st century, we finally realize the United States must produce a new, holistic, sustainable, ethical and environmentally friendly intermodal transportation system. This system would use alternative, reusable fuel sources to create an efficient rail-based freight and passenger transportation network,” said Carmichael. In addition, the FRA’s National Rail Plan should include Canada and Mexico, he added. By double- or triple-tracking at least 30,000 miles of mainlines with 100 percent grade separations, and using new technologies such as GPS, positive train control and digital sensors, an “ethical and sustainable, rail-based, North American transportation system will transform the continent’s infrastructure landscape in the next few decades,” said Carmicheal.

### FYI—Plan Costs This Much

#### The plan costs $148 billion

Cambridge Systematics 2007

(Cambridge Systematics specializes in: Policy, strategic planning, and management; transit; rail planning; economic analysis; freight systems and intermodal planning; transportation safety; transportation and the environment; forecasting; operations and simulation; performance-based planning and program management; innovative financing strategies; software and information technology consulting; and geographic information systems and data management. September 2007. A report prepared for Association of American Railroads. "National Rail Freight Infrastructure Capacity and Investment Study" http://www.aar.org/~/media/aar/Files/natl\_freight\_capacity\_study.ashx)

The cost of improvements needed to accommodate rail freight demand in 2035 is estimated at $148 billion (in 2007 dollars). The Class I freight railroads’ share of this cost is projected to be $135 billion; the short line and regional freight railroads’ share is projected to be $13 billion. The cost estimates cover: Line expansion: – Upgrades to mainline tracks and signal control systems; – Improvements to significant rail bridges and tunnels; – Upgrades to Class I railroad secondary mainlines and branch lines to accommodate 286,000-pound freight cars; and – Upgrades to short line and regional railroad tracks and bridges to accommodate 286,000-pound freight cars. • Facility expansion: – Expansion of carload terminals, intermodal yards, and international gateway facilities owned by railroads; and – Expansion of Class I railroad service and support facilities such as fueling stations and maintenance facilities.

### AT PTX: Rail Bill is a Win

#### **LOL. Your internal link is non-unique and link turned. Rail Bills are wins.**

Cooper 7/2

[Donna Cooper](http://www.americanprogress.org/experts/CooperDonna.html) | July 2, 2012 New Highway Bill Leaves Bumps in the Road Congress Has to Start Working on Legislation that Meets 21st Century Needs http://www.americanprogress.org/issues/2012/07/highway\_bill.html

Congress finally reached a bipartisan agreement on Friday to continue highway and transit funding, and passed the [Moving Ahead for Progress in the 21st Century Act](http://www.rules.house.gov/Media/file/PDF_112_2/LegislativeText/CRPT-112hrpt-HR4348.pdf), or MAP 21. The bill faced a rough road to passage. Some Republicans in the House and Senate pulled out all the stops to derail an agreement. They [proposed to link passage of the bill to forced approval of the Keystone tar sands pipeline from Canada without determining the pipeline's impact on air or water pollution and overturning the Environmental Protection Agency’s ruling on coal ash](http://www.bloomberg.com/news/2012-06-27/keystone-coal-ash-dropped-from-highway-bill-inhofe-says-1-.html). But [Senate leadership](http://thehill.com/blogs/transportation-report/highways-bridges-and-roads/217081-reid-does-not-plan-senate-vote-on-house-short-term-highway-bill-extension) stood firm, demanding a two-year bill without the highly charged and environmentally damaging provisions.

The bill is a political victory for Democrats. It also means America’s construction sector will enjoy a year and a half of predictable work, nearly [2 million jobs](http://thinkprogress.org/economy/2012/06/18/501154/house-gop-transportation-deadline/) will be sustained, and some of the urgently needed road, bridge, transit, and rail improvements will get underway. But let’s not kid ourselves. The bill falls far short of what’s needed to build a 21st century transportation system capable of improving [U.S. competitiveness](http://www.americanprogress.org/issues/2012/02/pdf/infrastructure.pdf).

### AT PTX: Trucking Lobby Supports Plan

#### No Link to Politics: Trucking Lobby Will Support

Longman ‘9

Phillip Longman is a senior fellow at the New America Foundation. Back on Tracks

A nineteenth-century technology could be the solution to our twenty-first-century problems. <http://www.washingtonmonthly.com/features/2009/0901.longman.html#Byline>, Jan/Feb

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’s important to remember that big trucking companies, facing acute driver shortages and mounting 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.

### AT: Minimal Action CPs

#### Can’t Simply Add Up Capacity and Demand—Peak Hour Mean Averages Don’t Work in Calculating Risk of Crisis

Hamberger ‘8

STATEMENT OF EDWARD R. HAMBERGER PRESIDENT & CHIEF EXECUTIVE OFFICER ASSOCIATION OF AMERICAN RAILROADS BEFORE THE U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE SUBCOMMITTEE ON RAILROADS, PIPELINES, AND HAZARDOUS MATERIALS HEARING ON RAIL CAPACITY APRIL 23, 2008 Association of American Railroads 50 F Street NW Washington, DC 20001, <http://republicans.transportation.house.gov/Media/File/Testimony/Rail/04-23-08-Hamberger.pdf>

Rail traffic is not uniformly distributed each day, so on some days considerably more than 100,000 carloads are originated. In fact, the carloadings on the heaviest business day of the busiest season may exceed by 40 percent those of the lightest business day of the lightest season. The variance is caused in roughly equal parts by seasonal demand and the five-day work week of most rail customers. These demand variations have a significant impact on rail capacity requirements.

### AT: Trust Fund CP

#### Trust Fund Would Fail—Money Would be Diverted to Highways and Trucks, Crush Solvency

AAR ‘3

Association of American Rairoads. RAILROADS URGE MORE PUBLIC/PRIVATE PARTNERSHIPS, <http://www.aar.org/NewsAndEvents/Press-Releases/2003/06/Railroads%20Urge%20More%20PublicPrivate%20Partnerships.aspx>, June 26.

The AAR official was sharply critical of proposals to establish a rail trust fund to pay for rail infrastructure projects. He noted that proposals for a rail trust fund call for most of the money to be raised from Class I railroads and rail customers. But the proceeds, he said, would be distributed by the government — “minus inevitable bureaucratic overhead.” Beyond this, “the pressure to use these funds to finance non-Class I projects — including passenger rail, highway-rail crossing traffic control devices or short line railroad infrastructure — would be tremendous,” Hamberger said. Taxes used to fund a rail trust fund would also increase the cost of shipping by rail, he added. “The net effect of this would be to needlessly divert rail traffic to trucks, with attendant negative ramifications for economic efficiency, congestion, the environment and safety.

### AT: Private Action CP

#### Private Investment and Capital Projects Can’t Build Key Infrastructure Even At Maximum Financial Health

Hamberger ‘8

STATEMENT OF EDWARD R. HAMBERGER PRESIDENT & CHIEF EXECUTIVE OFFICER ASSOCIATION OF AMERICAN RAILROADS BEFORE THE U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE SUBCOMMITTEE ON RAILROADS, PIPELINES, AND HAZARDOUS MATERIALS HEARING ON RAIL CAPACITY APRIL 23, 2008 Association of American Railroads 50 F Street NW Washington, DC 20001, <http://republicans.transportation.house.gov/Media/File/Testimony/Rail/04-23-08-Hamberger.pdf>

As described above, the railroads are diligently doing everything they believe to be prudent to maintain and expand their capacity to provide service, including committing record levels of investment. However, it is important to note that because U.S. freight railroads are overwhelmingly privately owned and must finance the vast majority of their infrastructure spending themselves, capacity investments are accompanied by substantial financial risk. As the Government Accountability Office noted in a recent report, “Rail investment involves private companies taking a substantial risk which becomes a fixed cost on their balance sheets, one on which they are accountable to stockholders and for which they must make capital charges year in and year out for the life of the investment.6 Accordingly, railroad capacity investments must pass appropriate internal railroad investment hurdles — i.e., the investments will be made only if they are expected to generate an adequate return. For this reason, adequate rail earnings are critical for capacity investment. As the Congressional Budget Office (CBO) has noted, “As demand increases, the railroads’ ability to generate profits from which to finance new investments will be critical. Profits are key to increasing capacity because they provide both the incentives and the means to make new investments.”7 If a railroad is not financially sustainable over the long term, it will not be able to make capacity investments to maintain its existing network in a condition to meet reasonable transportation demand, or make additional investments in the replacement or expansion of infrastructure required by growing demand. To be sure, railroads in recent years have achieved financial results that are much better than their results since the 1970s. In 2006, U.S. railroads carried more freight than ever before, and their net income was higher than ever before as well. The railroads enjoyed relatively good financial results in 2007 as well. But these financial results need to be kept in context. Statements about railroads’ “record profits” often ignore the fact that rail profitability in earlier years was relatively poor. Thus, an improvement from earlier years may be a “record,” yet still fall short of the earnings achieved by most of the other industries against which railroads compete for capital. In fact, that is the case with the rail industry. Rail industry profitability has consistently lagged most other industries — and that is still the case today. Return on equity (ROE) is a common profitability measure. According to data compiled by Value Line (a financial information firm), the ROE for the rail industry in 2006 was 14.0 percent — possibly the best ROE the U.S. rail industry has ever had. (Value Line’s railroad universe includes BNSF, CSX, CN, CP, KCS, NS, UP, and Genesee & Wyoming.) By contrast, the median ROE in 2006 for the 88 industries (encompassing around 1,700 firms) for which Value Line calculates ROE was 16.5 percent — 18 percent higher than the rail figure. In fact, in 2006 railroads ranked tied for 58th among the 88 industries for which Value Line calculates ROE aggregates. Preliminary Value Line data for 2007 indicate that the railroad median (14.0 percent) will again fall short of the median for all industries (16.0 percent). Data from the Fortune 500 tell a similar story: the median ROE for the four major railroads in the Fortune 500 was 15.0 percent in 2006. By contrast, the median ROE for all Fortune 500 firms was 15.4 percent. In other words, while recent years may have been the best financial years ever for railroads, they have not been sufficient to bring railroads even to the mid-point among all industries, and the need for financial sustainability is as pronounced today as ever before — especially in view of the projected investment requirements the industry will be facing. According to the Cambridge Systematics study noted earlier, an investment of $148 billion in 2007 dollars (of which $135 billion is for Class I railroads) will be necessary for rail infrastructure expansion to keep pace with economic growth, meet the DOT’s forecast demand, and maintain (but not grow) rail’s current market share. That expenditure is in addition to the hundreds of billions of dollars necessary over this period to maintain and replace existing rail infrastructure, and to maintain and replace locomotives, freight cars, and other equipment. Class I railroads are anticipated to be able to generate (through earnings growth from the additional traffic and productivity gains) only $96 billion of the $135 billion needed for new capacity identified by the Cambridge Systematics study. That leaves a funding shortfall that could be covered by tax incentives for rail infrastructure investments, public private partnerships, or other means. Railroads will continue to spend significant amounts of their own funds to address the capacity challenges described above. However, they are, and will continue to be, unable to pay for all of the capacity that would be required to serve all shippers’ needs all of the time. Since the amount of rail capital available for investment is limited, investment decisions in these circumstances focus on which investments to choose between, rather than solely whether a specific investment should be made. In such cases, those investment decisions should be based on projected returns that will most favor the long-term sustainability of the rail network.

### AT: Spending—It’s Cheaper

#### Rail is cheaper to maintain than roads-electrical shift causes decrease in road repair spending

Drake 10 (Alan, consulting engineer, “an American Citizen’s Guide to an Oil-Free Economy”, 10/27/10, http://www.energybulletin.net/stories/2010-10-27/book-excerpt-american-citizen’s-guide-oil-free-economy-chapter-1-electrified-and- Accessed: 6/27/12

The more society uses roads, the more expensive and slower road transportation becomes. Highway and road expansion projects show that the marginal cost for increased road capacity is higher, usually far higher, per lane mile or vehicles per hour than the inflation adjusted cost of the original road. And the USA is having increasing difficulty in just maintaining the roads we inherited, much less an ever expanding network. The opposite is true for rail. Extra capacity on existing right-of-way (ROW) is usually significantly cheaper than the base cost. The more we use rail, with appropriate infrastructure investments, the cheaper and faster transportation by rail becomes. The annual maintenance budget for an expanded rail freight system will be significantly less than for trucking highways. Building the subsidized Interstate Highway system reduced rail use and shoved railroads into the higher cost, lower volume end of the increasing efficiency with increasing volume curve of rail operations. The market is now slowly moving back down this virtuous curve as rail expands. This paper advocates a significant push down the curve towards faster and cheaper rail service. Increasing the rail modal share of freight will also significantly reduce highway maintenance for even greater economic savings. Roads have unrestricted access and need to be sized to meet peak demand. Roads also create their own demand over time, thus we simply cannot build “enough” roads, or buy enough oil to operate on them. Clearly, more roads are simply not the answer. Trains are scheduled and routed and their demand can be managed with creative dispatching, adequate track capacity and state-of-the-art signaling. These strategies expand rail capacity very cost effectively, reduce transit times and lower unit costs. So greater use of electrified railroads is an essential part of the answer. Much can be done in six years, but the horizon I am proposing is twenty years, with some additional “in fill” work for another decade. However, oil emergencies can develop in a matter of days. Therefore, infrastructure investment in oil-free transportation should be “forward leaning” to ensure greater elasticity of transportation supply and rapid expansion in the event of an oil supply shock.

#### Plan is a Net Spending Decrease Because of Highway Cost Savings

Longman ‘9

Phillip Longman is a senior fellow at the New America Foundation. Back on Tracks

A nineteenth-century technology could be the solution to our twenty-first-century problems. <http://www.washingtonmonthly.com/features/2009/0901.longman.html#Byline>, Jan/Feb

The alternative is for the public to help pay for rail infrastructure. Actually, it’s not much of a choice. Unlike private investors, the government must either invest in shoring up the railroads’ overwhelmed infrastructure or pay in other ways. Failing to rebuild rail infrastructure will simply further move the burden of ever-increasing shipping demands onto the highways, the expansion and maintenance of which does not come free. 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 costs), and adding $10 billion to highway costs over the next twenty years. "Inclusion of costs for bridges, interchanges, etc., could double this estimate," their report adds.

### AT: HSR CP

**Only plan solves. HSR won’t work-freight capability is key**

Drake 8, Alan, consulting engineer, “Multiple Birds-One Silver BB: A synergistic set of solutions focused on Electrified Railroads, 7/15/08, http://www.theoildrum.com/node/4301 Accessed: 6/26/12

The USA does not have enough rail passenger demand to justify more than isolated sections of high or semi-high speed rail passenger only service. The author’s position is that EU and Japanese style High Speed Rail is wasteful of both scarce capital and energy at this time, HSR costs much more per mile than semi-HSR and cannot handle medium density freight, only passengers and light parcels. CSX estimates 1,200 miles of semi-HSR will cost $15 to $25 billion which is much lower per mile than any of the varying California estimates for High Speed Rail. Energy consumption increases with the square of the speed, a 190 mph train will use 3 times as much energy as a 110 mph train, a 220 mph train 4 times as much. The USA is not France: we simply cannot afford the “best” service in this generation and we do not have the energy to waste on maximum speed.

However, if express freight demand (with refrigerated vegetables and fruit being high volume customers) is combined with passenger demand, a viable national system can be created combining passenger service at 100 to 125 mph with express freight at 90 to 100 mph on existing but upgraded ROWs. The two concepts would work synergistically, operate on existing railroad ROWs and would economically justify a widespread network. Reliable 90 to 100 mph freight service should take modal share not only from trucks, but from air freight as well, vastly expending the scope of Non-Oil Transportation

### AT: Telecommuting

#### Telecommuting Doesn’t Solve

McCain ‘10

E.D. KAIN, Investing in freight rail could help curb climate change, <http://trueslant.com/erikkain/2010/07/27/investing-in-freight-rail-could-help-curb-climate-change/>, Jun 27.

Yes, teleconferencing and the internet can make many workplaces ‘virtual’ and can keep many commuters off the road entirely, but much of the future’s service economy will be unable to telecommute. For much of the economy, driving to work – or taking the bus or train – will still be necessary.

### AT: Railroads Are Profitable Now

#### Lack of Capacity Crushes Revenue

James McClellan, Woodside Consulting Group, December 1, 2010 [“Railroad Capacity Issues”]

<http://onlinepubs.trb.org/onlinepubs/archive/conferences/railworkshop/background-McClellan.pdf>

Capacity costs a lot of money. Track, yards, locomotives, and crews are all costly. A road locomotive costs almost $2 million, and then it needs shops and personnel to maintain it, a significant life cycle cost. Adding a locomotive to handle more business is a lot more costly than just the initial purchase price. A CTC-controlled siding costs in excess of $10 million; more if substantial grading is required. And, just like the locomotive, the initial investment must be supported by an expanded maintenance-of-way budget, including additional personnel. Rolling stock presents a similar capital and maintenance scenario. Trained crews represent a major investment as well. It takes months to hire, train and qualify entry-level train and engine service personnel. For that time period, the new hire is an operating cost that will significantly impact both profits and the operating ratio. All the time the pay and benefit costs must be met, not to mention the cost of recruiting and training. So whether the increasing capacity involves more locomotives, cars or track or people or a combination thereof, there is a substantial economic cost; costs that are always dependent on finding the required financing. Railroading is a careful balancing act and compromises between service quality, operating efficiency and financial returns are made on a constant basis. If there is too little capacity, then traffic and revenues are lost and operating costs increase as the velocity of cars, locomotives, and crews decline. But too much capacity (again, track, terminals, cars, locomotives, and crews) means that financial returns decline and the availability of capital becomes more expensive. So management is in a constant struggle to create “just in time” capacity; having the needed resources in place when needed and not six months too soon or six months too late.

### SIS Efficiency

#### SIS creates fuel, time and space-efficient tracks

North American Steel Interstate Coalition 10, Steel Interstate System Concept, http://steelinterstate.org/concept

High-capacity means that these main lines would have at least two through tracks, so that trains can be handled in both directions without having to stop and meet oncoming trains. Because the nation’s rail system has stagnated and declined over the five decades that the Interstate Highway System has been built out, many places where rail lines once featured multiple tracks today have only one. Modern signaling systems permit trains to operate in both directions on a single track with periodic passing sidings, but this drastically reduces capacity and fluidity of movement because trains inevitably have to stop and wait at the sidings for oncoming trains to pass. The Steel Interstate will require the capacity and speed afforded by multiple tracks. In some places a second track can be added rather easily on rights-of-way that once had two or more tracks. In other places the added track capacity will be more difficult to install, requiring new grading, bridges, and relocation of equipment. Electrified means that the SIS network will be powered by electricity, provided to electric locomotives from a system of overhead wires called catenary. A spring-tensioned device on top of the locomotive, called a pantograph, presses against the catenary making a solid contact for the electric current to flow. Today in North America only Amtrak’s Northeast Corridor passenger operation uses such an electrified system. Trains in the rest of the country are powered by diesel locomotives, where fuel is burned on board to generate electricity to power the locomotive’s traction motors. Electrified rail operations are not technically new or complex. Railroads throughout much of the world are powered this way today. Electric operation is a key part of the SIS because of certain efficiencies offered versus diesel-powered trains. But most importantly because domestically generated electric power can be substituted for foreign oil. This produces enormous economic benefits that accrue year after year and can help pay for the Steel Interstate System. Grade-separated means that rail lines of the Steel Interstate will not cross roads and highways at grade, but will pass over or under using bridges or underpasses. Again, this is analogous to the design advancement brought about in Interstate Highways. No longer was it necessary to drive through every town en route and stop at intersections. Rail operations will be substantially expedited by having all major grade crossings eliminated. Increased train frequencies and speeds will not adversely affect the driving public, and safety will be greatly improved by removing a major cause of vehicle/train collisions.

#### SIS infrastructure increases speed and efficiency

North American Steel Interstate Coalition 10, Steel Interstate System Concept, http://steelinterstate.org/concept

Speed is greatly improved because there is room on the SIS for through trains in both directions to run without having to stop for opposing trains. Plus there would be extra tracks where needed for faster trains to get around slower ones, or to permit separate passenger train operations. Furthermore, trains can move on the core network over long distances avoiding the congestion of yards and terminals. Trains would exit from the SIS network, just as we exit from the Interstate Highways today, to interface with local rail operations such as yards, terminals, and local industrial switching. The SIS is not a high speed rail system for passenger trains; rather it is a vastly upgraded network of key rail corridors that can serve both freight and passenger trains in a range of speeds up to 110 mph on shared right-of-way, with a typical speed target of 79 mph.

#### SIS would be much more reliable than current rail systems

North American Steel Interstate Coalition 10, Steel Interstate System Concept, http://steelinterstate.org/concept

The Steel Interstate will provide adequate capacity so that all trains, both passenger and freight, can move fluidly over the network without getting in each other’s way or having to stop and wait. This will enable freight to be more truck competitive and move much better on just-in-time schedules that shippers want. Passenger trains will be able to maintain published schedules and not be delayed frequently by freight trains blocking the lines.

### Infrastructure Solves Oil Dependence

#### Plan allows for greater capacity, increases efficiency and lessens fuel dependence

North American Steel Interstate Coalition 10, Steel Interstate System Concept, http://steelinterstate.org/concept

Capacity of the key SIS corridors would be much greater than today’s existing lines, primarily due to the use of multiple tracks. Trains of all kinds could be accommodated – conventional freight, unit trains, double-stack container trains, open-intermodal trains such as rolling highway (truck ferry), mail and express, perishable cargoes, and passenger trains. Railroads would not have to turn away business desiring to shift to rail because of highway congestion, driver shortages, or skyrocketing fuel costs. This is an important social benefit to the nation, because from an environmental standpoint it should be national policy to maximize freight movement by rail. The SIS makes this possible. Rail traffic will have room to grow again. And every ton or passenger switched from the highway to electrified rail will lessen our chronic dependence on oil to power the transportation sector of our economy.

#### Plan helps maintain national security by reducing oil dependence and reinforcing the economy

North American Steel Interstate Coalition 10, Steel Interstate System Concept, http://steelinterstate.org/topics/economic-strength-national-security-0

A nation cannot support a strong military, if it is weakening economically. To combat the economic downturn in the U.S., government response focused primarily on bailouts with some money going to stimulus spending. Of the over $3 trillion expended (with trillions more committed) [Goldman, D., CNN.com, Bailout tracker,] the money has primarily gone to bailouts of investment and commercial banks, Fannie and Freddie federal mortgage underwriters, AIG insurance group, and state government programs. When making massive federal investments, we need to take a page from Great Depression recovery programs and emphasize capital formation, more commonly referred to as development of infrastructure. That way our country gets a lasting benefit from the monies spent. When the federal omnibus transportation reauthorization is marked up, representatives and senators should be thinking about a sea change in how we spend transportation money. Investment in constructing the Steel Interstate System will stimulate the economy now and bring lasting economic benefits for generations. The Steel Interstate System is sustainable public investment. A modeling study by the Millennium Institute [Drake, A., Bassai, A., Tennyson, E.L., Herren, H.R., Evaluating the Creation of a Parallel Non-Oil Transportation System in an Oil-Constrained Future, Millennium Institute, January, 2009.] shows that a renewed national rail system similar to Steel Interstate System would help achieve numerous national goals for oil-free transportation and greenhouse gas abatement. While many actions to reduce greenhouse gases are an economic drag, building the Steel Interstate to move freight would act as a seedbed for broad national economic growth. Not even accounting for benefits from inter-city passenger rail service, a federal investment of: $250-500 billion in inter-city railroad lines Non-Oil Transportation could supplant most inter-city truck freight and unspecified modal share of passenger service. Up to $60 billion/year ($1.2 trillion over 20 years), spent cost effectively on Urban Rail, should allow for 28% annual growth (not compounded) in urban passenger-miles on Non-Oil Transportation. These two investments create an 11% larger GDP…and a 26% reduction in oil consumption already in 2030 versus a strictly market based reaction. Adding renewable energy [a program of game-changing investments in residential, business, and utility investments in renewable energy] improved the results to GDP +13%, GHG -38% and oil consumption -22%.[Ibid, Abstract, p. 1.] Editors note: Oil consumption increases in this last scenario to account for constructing the renewable power network.] The Steel Interstate System is the only national infrastructure program that can help pay for itself. The Steel Interstate repays its own investment costs by: significantly reducing national expenditures on foreign oil improving the balance of payments, increasing freight movement productivity, and stimulating the economy more effectively than equivalent investments necessary to maintaining the current petroleum/highway-based freight economy. [embedded link to Economic Dividends topic] Though federal investment in loan guarantees is required as a catalyst to begin the commitment, private capital will flock to the opportunity as the network expands and a greater and greater percent of the nation’s freight moves on the electrified Steel Interstate, the savings likewise grow. And they continue year after year. With less than a 1% increase in electric generation, we can displace 12% of total U.S. oil consumption.[Drake, A., Multiple Birds – One Silver BB: A syngistic set of solutions to multiple issues focused on Electrified Railroads, The Oil Drum, 7-15-08.] [embedded link to Oil-Free Transportation-location] An economically strong nation is a secure nation. If we can reduce reliance on foreign oil and substitute domestic electric generation, we can keep billions of dollars here in America year after year, generating jobs and economic growth and enhancing economic competitiveness.

### Infrastructural Changes (SIS)

#### Freight Network would create a more efficient rail network through infrastructural changes (explanation card—tells of specific changes to be made)

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High-capacity means that these main lines would have at least two through tracks, so that trains can be handled in both directions without having to stop and meet oncoming trains. Because the nation’s rail system has stagnated and declined over the five decades that the Interstate Highway System has been built out, many places where rail lines once featured multiple tracks today have only one. Modern signaling systems permit trains to operate in both directions on a single track with periodic passing sidings, but this drastically reduces capacity and fluidity of movement because trains inevitably have to stop and wait at the sidings for oncoming trains to pass. The Steel Interstate will require the capacity and speed afforded by multiple tracks. In some places a second track can be added rather easily on rights-of-way that once had two or more tracks. In other places the added track capacity will be more difficult to install, requiring new grading, bridges, and relocation of equipment. Electrified means that the SIS network will be powered by electricity, provided to electric locomotives from a system of overhead wires called catenary. A spring-tensioned device on top of the locomotive, called a pantograph, presses against the catenary making a solid contact for the electric current to flow. Today in North America only Amtrak’s Northeast Corridor passenger operation uses such an electrified system. Trains in the rest of the country are powered by diesel locomotives, where fuel is burned on board to generate electricity to power the locomotive’s traction motors. Electrified rail operations are not technically new or complex. Railroads throughout much of the world are powered this way today. Electric operation is a key part of the SIS because of certain efficiencies offered versus diesel-powered trains. But most importantly because domestically generated electric power can be substituted for foreign oil. This produces enormous economic benefits that accrue year after year and can help pay for the Steel Interstate System. Grade-separated means that rail lines of the Steel Interstate will not cross roads and highways at grade, but will pass over or under using bridges or underpasses. Again, this is analogous to the design advancement brought about in Interstate Highways. No longer was it necessary to drive through every town en route and stop at intersections. Rail operations will be substantially expedited by having all major grade crossings eliminated. Increased train frequencies and speeds will not adversely affect the driving public, and safety will be greatly improved by removing a major cause of vehicle/train collisions. Core network means that there will be a backbone of SIS-caliber railroad main lines, just as there is today a backbone structure of Interstate Highways. In both cases the core network of main routes supports and feeds traffic to and from a larger network of secondary routes. It would consist of between 38,000 and 45,000 route-miles and be largely congruent with the Department of Defense’s Strategic Rail Corridor Network (STRACNET) and the National Association of Railroad Passengers (NARP) Grid and Gateway vision; not including the Federal Railroad Administration’s High Speed Rail corridors operating above 110 mph (see section III, below).