



Full Speed Ahead:

Creating Green Jobs Through
Freight Rail Expansion

BLUEGREEN
ALLIANCE





Table of Contents:

Executive Summary

The Challenges 1

- A Jobless Recovery?..... 1
- Decline in Goods-Producing Jobs..... 1
- Infrastructure Investment, Foreign Oil Dependence and Climate Change 1
- Future Demand and Freight Rail Capacity 2

The Freight Rail Solution 2

Freight Rail Jobs are Green Jobs 3

Addressing Other Environmental Concerns 5

Freight Rail Creates Employment Throughout the Economy 5

- Investment and Economic Impact..... 5
- How Many Jobs? 6
- Direct and Indirect Job Creation..... 7
- Additional Employment Impacts – Induced Jobs 8
- What Kinds of Jobs? 8
- Caveats to Using Economic Models 8

Recommendations 9

Conclusion 11

Executive Summary

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.

The Challenges

A Jobless Recovery?

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

characteristics make manufacturing jobs a vital rung in the climb up the socioeconomic ladder, and their demise is widening the income gap in America.

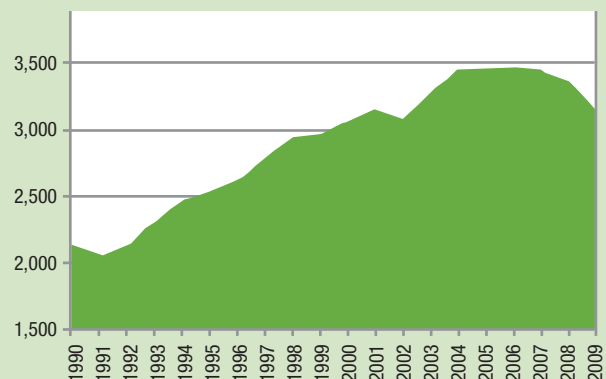
In March 2010, President Barack Obama announced a goal of reversing the decline of goods-producing industries and doubling the value of American exports by 2015. Such an undertaking, which could create 2 million new American jobs, would also ideally prompt expansion of the freight rail system to move 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.

Infrastructure Investment, Foreign Oil Dependence, and Climate Change

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.^{viii}

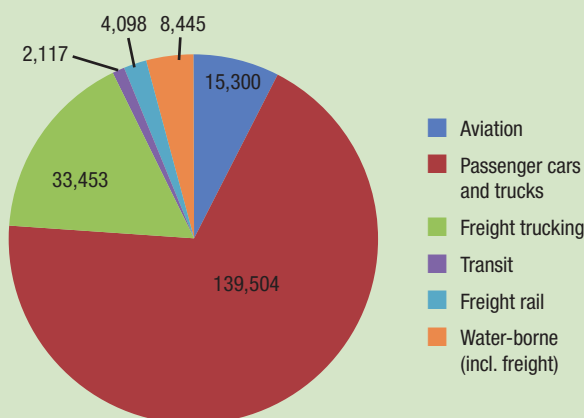
Table 1: U.S. annual oil imports from 1990-2009
(millions of barrels)



Source: U.S. Energy Information Agency

Economic models estimate about 7,800 green jobs are created for every billion dollars of freight rail capital investment.

Table 2: 2005 U.S. petroleum-based fuel consumption by transportation mode (millions of gallons)



Source: Bureau of Transportation Statistics

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}

Corresponding with reliance on fossil fuels is the production of greenhouse gases (GHGs) that contribute to climate change. Currently, transportation accounts for nearly a third of America's GHGs, necessitating more efficient approaches across all transportation modes if the sector can become part of the solution for achieving energy independence and addressing the impacts of climate change.

Future Demand and Freight Rail Capacity

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.^x

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.^{xi} 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.

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}

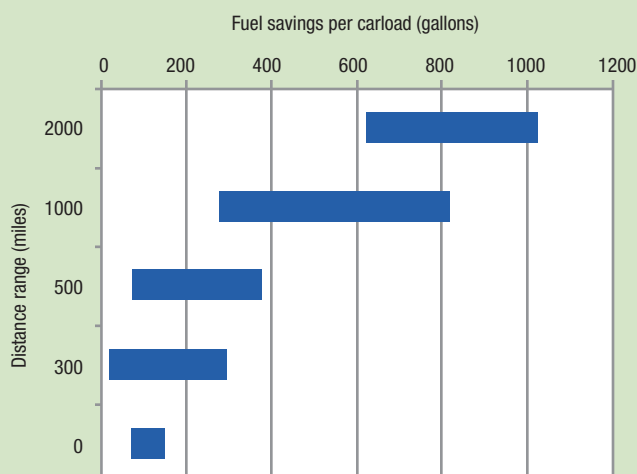
These projections factor current market trends and do not account for concerted efforts undertaken to combat foreign oil dependence and the effects of climate change. Given transportation's impact on both of these fronts, making progress on oil savings and reducing GHGs will accelerate the need to capitalize 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.

The Freight Rail Solution


America's freight rail networks, comprising about 140,000 miles, move more than 2.2 billion tons of freight annually. Among the 50,000-plus miles of primary rail corridors in the U.S., up to 140 trains per day move commodities such as crops, ore, and manufactured goods for processing and distribution.^{xiii}

Freight rail is a far more efficient mode of transporting bulk goods when ranked against trucking and aviation, especially over long distances, by moving a ton of freight 480 miles per gallon of fuel consumed.^{xiv} On a per-ton basis, trucking uses on average four times the energy to transport freight versus rail.^{xv} While trucks are

Table 3: 2003 Rail versus truck fuel savings per distance segment



Source: ICF International



Expanding capacity would allow freight rail to capitalize on the growing intermodal market, which transports more than 12 million containers annually.

necessary to carry goods over the “last mile” — from local and regional distribution centers to market — freight rail is the most efficient means of moving freight medium and long distances from ports and inland terminal centers.^{xvi}

Advances in locomotive and rail system efficiency have increased substantially in the past two decades, with the freight rail industry having increased its fuel economy 38 percent since 1990, compared to 11 percent for trucks through the same period. In recent years, railroads have implemented advanced monitoring systems to improve engineers’ ability to drive at speeds that maximize fuel savings. Railroads have also invested in lighter freight cars and more efficient locomotives to reduce fuel consumption. These efficiency gains have allowed the freight rail industry to double the number of ton-miles traveled without increasing energy use over the last three decades. In 1980, freight rail transported 919 billion ton-miles of cargo; by 2008 this increased to 1.8 trillion ton-miles, and fuel consumption remained steady at nearly 4 billion gallons over those three decades.^{xviii}

Energy savings fostered by transporting freight via rail results in lower GHGs. While accounting for nearly half of total U.S. freight ton-miles, rail currently contributes only about 11 percent of freight-related carbon dioxide pollution.^{xix} Furthermore, in 2010 the U.S. Environmental Protection Agency proposed that shifting five percent of truck freight to freight rail would significantly contribute to reducing greenhouse gas emissions to levels that would help solve climate change.

To the extent freight rail investments improve the movement of freight and passengers, we will also have the added benefit of oil savings and GHG reductions from better intercity passenger rail services.

Freight Rail Jobs are Green Jobs

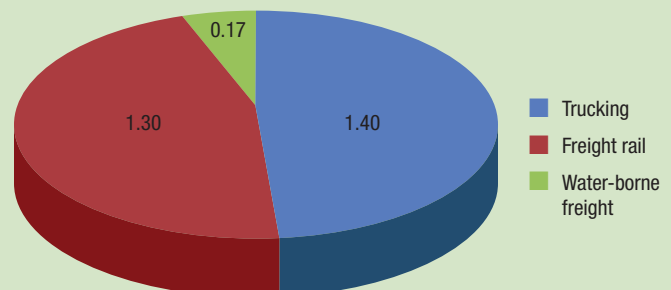
Green jobs are those jobs which help achieve goals to reduce climate impact, save energy, encompass waste reduction and recycling, conserve water, lower carbon pollution, produce renewable energy, recycle resources and goods and remediate environmental problems. Freight rail jobs, key to reducing carbon and saving energy in the transportation sector, meet this standard.

This assertion is reinforced by emerging standards of economists and labor market analysts who are at the beginning stages of codifying working — and workable — definitions of green jobs.

The transition to a low-carbon economy is a dynamic process and green jobs will evolve along an ever-improving continuum. To date, perhaps the most comprehensive labor market analysis of green jobs has been developed by authors writing on behalf of the Occupational Information Network (O*NET), which prepared a 2009 report for the U.S. Department of Labor entitled *Greening of the World of Work*. This report analyzes the impact of the growing green economy on occupational requirements and on the broader systems of industrial and occupational categorization used by workforce and economic developers to track industry demand for specific occupations, as well as the wages earned and skills required by workers in those occupations. These systems, the North American Industrial Classification System (NAICS) and the Standard Occupational Classification (SOC), don’t recognize separate “green” categorizations for either industries or occupations. Therefore, the report is necessarily crosscutting in its approach, not least in the definition it offers of the “green economy,” which spans multiple industries and is analogous to the definition offered above:

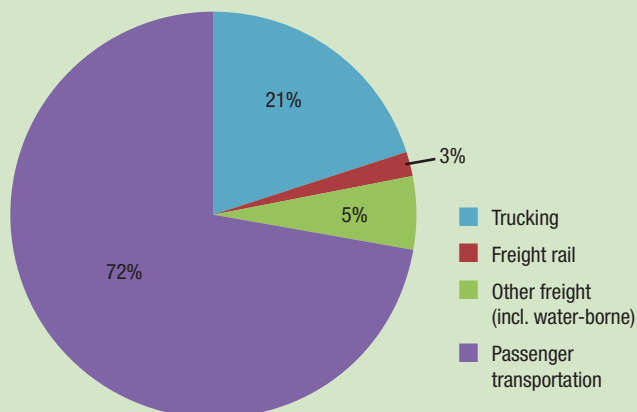
The green economy encompasses the economic activity related to reducing the use of fossil fuels, decreasing pollution and greenhouse gas emissions, increasing the efficiency of energy usage, recycling materials, and developing and adopting renewable sources of energy.

Table 4: 2007 U.S. total surface freight ton-miles by mode (trillions of ton-miles)



Source: Bureau of Transportation Statistics

Table 5: 2007 U.S. transportation greenhouse gas emissions by mode



Source: U.S. Environmental Protection Agency

The report goes on to define twelve broad industry sectors that meet this definition. One of those sectors is transportation, which is defined as follows:

This green economy sector covers activities related to increasing efficiency and/or reducing the environmental impact of various modes of transportation, such as trucking, mass transit, freight rail, and water.

The report then develops a typology of different green job occupational categories, organized by the skills required for these jobs and the degree to which these are new skills. This typology illustrates how most green jobs are, in fact, current occupations in present-day industries:

- 1) existing occupations expected to experience primarily an increase in employment demand;
- 2) existing occupations with significant change to the work and worker requirements; and
- 3) new and emerging green occupations.



In March 2010, President Barack Obama announced a goal of doubling the value of American exports by 2015, which ideally would prompt expansion of the freight rail network to move more goods.

The report goes on to give examples of transportation sector jobs that are “green increased demand” jobs — the first of the three categories — as they correspond with O*NET-SOC occupations. These include a number of rail jobs:

Railroad Engineers	O*NET-SOC: 53-4011.00
Rail-Track Laying and Maintenance Equipment Operators	O*NET-SOC: 47-4061.00
Railroad Conductors and Yardmasters	O*NET-SOC: 53-4031.0

Greening of the World of Work thus contextualizes green jobs within the systems used for industry and occupational analysis and clearly identifies rail jobs as part of the categorization they offer for green occupations.

Building on this work, the Department of Labor’s Bureau of Labor Statistics (BLS) is in the process gathering data about green jobs in order to develop a definition of green industries and green jobs that is comprehensive and robust enough to serve as the basis for future policymaking and labor market analysis.

Accompanying their notice of solicitation of comments published in the Federal Register in March 2010, BLS proposed a list of industries that should be considered green. One of the industries proposed is Line-Haul Railroads (NAICS Code # 482111), which NAICS defines as: “...primarily engaged in operating railroads for the transport of passengers and/or cargo over a long distance within a rail network...”

While BLS is not clear at their present stage of analysis about how high up the supply chain, or how broadly, to label manufacturing industries as green, the list does include Railroad Rolling Stock Manufacturing (#336510) as a proposed green industry.

Furthermore, supporting industries that lay the foundation of freight rail infrastructure play a large part in contributing to transportation efficiency, and as such, could meet the standards as currently



In 1980, freight rail transported 919 billion ton-miles of cargo; by 2008 this increased to 1.8 trillion ton-miles, and fuel consumption remained steady at nearly 4 billion gallons over those three decades.

proposed. These existing occupations — such as construction trades that lay track and build supporting infrastructure and rail equipment manufacturers — generate and sustain employment based mostly, if not entirely, on capital investments that enhance freight rail efficiency.

Freight rail and supporting industry jobs are green jobs, and the emerging consensus suggest this will be the case as the definition is further refined. Labor market analysts, advocates, workforce and economic development practitioners can all build on this foundation.

Addressing Other Environmental Concerns

While freight rail expansion is part of the move to a clean energy economy, this is not to be broadly interpreted that all freight rail activities are beneficial to the environment. Like most other industries, there are areas where better practices can be developed and employed to offset negative environmental impacts.

For example, while the freight rail industry has made significant progress in improving fuel efficiency, fossil fuels are the basis of locomotive energy and pollution is inevitably created. In California, communities are concerned about the concentration of diesel emissions produced by trucks, trains and cargo-handling equipment in rail yards, which some say result in high cancer risks for neighboring communities.

Progress in areas such as this is necessary to truly capitalize on the green potential of freight rail. Pro-active efforts on the part of the industry, such as working with the California Environmental Protection Agency's Air Resources Board to solve community pollution issues, are steps in the right direction. The railroads also have extensive programs in place also to limit pollution related to fuel and industrial processes, and to reward complying with and exceeding local, state and national environmental standards.

Federal policy holds potential to promote substantial emissions reductions across the industry: in March 2008, the EPA issued new locomotive emissions standards, effective in 2015, that will cut particulate emissions by up to 90 percent and nitrogen oxide emissions by up to 80 percent. The freight rail industry is committed to meeting these mandates and supportive of federal emission standards, as they align with the industry's ongoing efforts to advance system efficiency and invest in fuel-efficient vehicles and equipment.

Freight Rail Creates Employment Throughout the Economy

Investment and Economic Impact

Coast to coast, the freight rail industry links commerce and helps drive the American economy. The freight rail industry is a significant economic engine, contributing nearly a quarter of a trillion dollars of total economic activity annually, and is supported directly and indirectly by about 1.2 million workers. As such, the freight rail industry and its supportive sectors comprise a value-add to the economy, representing 1 percent of the U.S. workforce that creates 2 percent of output within America's \$14 trillion economy.^{xviii}



A TTX employee performs repairs on a coupling to help recondition a freight railcar.

Freight Rail Industry Profile: TTX Company

Headquarters: Chicago, IL

Total employees: 867

Locations: Jacksonville, FL; Joliet, IL; Waterford, MI; North Augusta, SC; TTX Company also has employees located at 33 major rail facilities throughout the United States.

Company description: TTX maintains and supplies large pools of railcars which are shared among the railroads and rail shippers. Unlike cars owned by the individual railroads, TTX Company railcars do not have to be returned empty to the owning railroad after being unloaded by another railroad. Instead, the railcars can be reloaded and transported to any other destination by any railroad.

This practice prevents more than 2.5 billion empty miles per year, saving more than 167 million gallons of fuel annually.

Supporting clean energy: TTX provides numerous car types for the transportation of blades, towers, nacelles, hubs, and other wind power generating equipment. Moreover, TTX Company's engineers possess substantial expertise in modifying railcars for this service in conjunction with engineering firms and wind turbine manufacturers that design and manufacture the fixtures that apply the components to the railcars.

For instance, TTX has converted hundreds of 89-ft flat cars and former intermodal spine cars (each spine car is at least 260-ft long) to handle wind turbine blade fixtures. Likewise, these and other cars transport the tower sections as well. Additionally, TTX Company's large fleet of heavy-duty flat cars, bulkhead flat cars and 89-ft, 110-ton flat cars are all suited to carry heavy nacelles and hubs.

Union support: TTX Company has 357 employees that are members of the Brotherhood of Railway Carmen.

Within the industry itself, capital investment in freight rail presents a significant opportunity for American job creation. In 2008, the Class I railroads spent more than \$10 billion on infrastructure and equipment investment, and historically, the industry directs more than four times the proportion of revenues into capital investment compared to other industrial sectors.^{xxiii}

In addition to benefits accruing from energy efficiency and pollution reduction, investments in freight rail create quality jobs that on average are better paying and more accessible than jobs in the broader economy.

Specifically, America's freight rail providers comprise a \$65 billion a year industry, with freight rail employees directly representing about 180,000 jobs. Rail employees, the majority of whom are unionized, earn on average 30 percent more than the mean U.S. annual income and 74 percent more than workers in the transportation sector as whole.^{xxiv}

Table 6: 2008 Rail wages versus U.S., transportation occupations (mean hourly wage and annual income)

Occupation	Mean Hourly Wage	Mean Annual Income
All occupations	\$20.32	\$42,270
All transportation and material moving occupations	\$15.12	\$31,450
All rail transportation occupations	\$26.33	\$54,760
Locomotive engineers	\$25.71	\$53,470
Locomotive firers	\$25.46	\$52,950
Rail yard engineers, dinkey operators, and hostlers	\$16.76	\$34,850
Railroad brake, signal, and switch operators	\$23.75	\$49,400
Railroad conductors and yardmasters	\$26.02	\$54,120

Source: Bureau of Labor Statistics

How Many Jobs?

To estimate the types of jobs that are directly and indirectly created by investment in freight rail, we use a model that merges industrial data on input-output relationships with household-level data on demographic and labor market variables. We find that:

- \$1 billion of rail capital investment creates about 7,800 green jobs, which we define as jobs created in direct and supplier industries as a result of freight rail spending. These industries include:
 - Manufacturing – locomotives, freight railcars, shop machinery
 - Construction – rail roadway buildings, warehouses, grading
 - Iron and steel industries – rail and over-the-road track materials
 - Others – communications and computer support, timber for railroad ties, quarrying for rail ballast
- Rail capital investments create and sustain proportionately fewer low-wage jobs and more medium-wage jobs compared to the broader economy. They also benefit those hardest hit by the recession, providing a higher proportion of employment to workers without a college degree.
- Including the re-spending effects, \$1 billion of rail investments could create anywhere between approximately 12,300 to 26,600 total jobs throughout the US economy.

Freight Rail Employee Profile

Lyle Staley, a fourth generation railroader, began his rail career in 1969, served in the Navy and has since dedicated a total of 39 years to railroading with the Toledo, Peoria and Western (TP&W) Railroad.



Staley joined TP&W's Environmental/Hazardous Materials Department in 1994, and among his many certifications and duties, he developed a system-wide process to review energy usage, contributing greatly to the railroad's ability to determine, report and model emissions. Staley has also worked to transform locomotive pre-startup and fueling procedures, fuel leak prevention and training programs to promote significant energy savings and reduce pollution. For these and many other efforts, Staley won the rail industry's North American Environmental Employee Excellence Award in 2008 for environmental stewardship in executing his responsibilities.

Calculating what mix of jobs would be supported by higher rail investments involves three steps. The first is translating a package of capital investment (based on actual 2008 freight rail capital expenditures, which include equipment and infrastructure), into spending flows that match up with one or more of the 202 industries in the BLS 2008 nominal domestic employment requirements matrix.^{xxv}

Second, these spending flows are equated into employment impact. The BLS matrix shows how demand in a given industry is supported by employment in both that industry (the direct job impact) and other "supplier" industries (the indirect job impact).

For example, \$1 billion of demand in the construction industry has impacts outside of the BLS-defined industry as well. For example, \$1 billion in demand in any given industry would sustain jobs within that BLS-defined industry (the direct job impact), and also jobs in retail trade, health care, and a variety of other industries throughout the economy.



Freight rail jobs, key to reducing carbon in the transportation sector, meet the standard reinforced by economists and labor market analysts who are codifying working – and workable – definitions of green jobs.

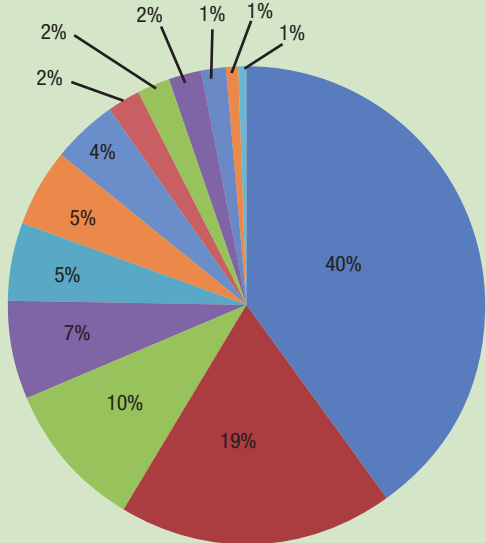
Direct and Indirect Job Creation

Lastly, demographic and labor market data from the U.S. Census Bureau's Current Population Survey (CPS) are factored to calculate the share of each industry's employment by relevant categories (gender, race, ethnicity, wage levels, etc.), referencing data from 2005 and 2007 to ensure the largest sample size possible.

A "crosswalk" approach matches up the CPS data on demographic and labor market variables with the BLS data on industry input-output relationships. This crosswalk* is easy to construct as it matches up both the CPS and the BLS industry codes to a third classification system, the NAICS, that maps onto both the CPS and BLS data.

By then multiplying the number of jobs created in each industry (either through direct spending or through supplier effects) by industry demographic shares and then summing these up across industries, we get the total number of jobs in each industry category (both direct and supplier jobs) that are created through a given amount of infrastructure spending.

Table 7: U.S. job creation, by industry type, resulting from freight rail capital investment



Source: Economic Policy Institute



Percentages do not total 100 percent due to rounding.

* This crosswalk is available from the authors upon request.

Of these direct and indirect jobs, we can impute a number of demographic attributes:

Table 8: Demographics of direct and indirect job creation from U.S. freight rail capital investment

Job Characteristics	Direct	Indirect (% of total)	Total	Overall Economy
Totals	45%	55%	100%	
Gender				
Male	88%	69%	77%	60%
Female	12%	31%	23%	40%
Race				
White	74%	70%	72%	67%
Black	7%	10%	9%	11%
Hispanic	16%	15%	15%	15%
Asian	1%	3%	2%	4%
Other	1%	2%	2%	2%
Education				
Less than High School	20%	14%	17%	11%
High School Only	41%	35%	38%	31%
Some College	26%	27%	27%	30%
BA or greater	12%	24%	18%	28%
Wage Quintiles				
First (lowest)	12%	18%	15%	19%
Second	24%	20%	22%	21%
Third	25%	22%	24%	20%
Fourth	22%	21%	22%	20%
Fifth (highest)	16%	19%	18%	20%
Region				
Northeast	18%	16%	17%	18
Midwest	23%	25%	24%	23
South	39%	36%	38%	35
West	20%	23%	21%	23
Central City status				
In central city of metro area	16%	23%	20%	27%
In metro area, not central city	39%	42%	41%	44%
Not in a metropolitan area	31%	19%	24%	14%
Not Identified	15%	16%	15%	14%

Source: Economic Policy Institute

Additional Employment Impact: Induced Jobs

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.

What Kinds of Jobs?

Rail investments tend to create quality employment opportunities. Relative to the overall economy, a disproportionately small amount of these jobs are low-wage, with more jobs created in the middle of the wage distribution. Over the past few decades hourly wage inequality has risen dramatically, becoming the single largest impediment to raising the living standards of average American workers. Much (though far from all) of this rise in wage inequality is attributable to the de-unionization of the workforce and growing wage advantage afforded to those with a college degree, factors also perpetuated in part by the loss of manufacturing jobs in the economy.^{xxix}

The model suggests jobs that support the freight rail industry tend to be slightly more unionized when compared with the general economy (13 percent for industries directly or indirectly supporting the freight rail industry, versus 12 percent for the economy as a whole)^{**}, a condition that often confers higher benefits and greater job security to workers. Finally, a much larger share of these jobs are available to the 70 percent of workers without a four-year college degree.

Caveats to Using Economic Models

Using an economic output multiplier to calculate re-spending jobs produces only a rough estimate. Implicit in this calculation is the assumption that the ratio of economic output to jobs — or, in other words, worker productivity — is the same in the broader economy (in which direct and indirect workers are re-spending their incomes) as it is in those direct and indirect industries. If, for example, productivity were lower in the re-spending industries compared to the direct and indirect industries, it would suggest that the economic multipliers actually understate the re-spending job impact.

These estimates are based on currently existing patterns of employment across sectors. As such, the final results suggest how many and what kinds of jobs would be created within the economy. However, to the extent that new investments are aimed at transforming the economy or labor market, the results are

^{**} While the majority of railroad employees are unionized, these workers are part of a subset of transportation and warehousing occupations, which only make up four percent of industries directly and indirectly supporting the freight rail industry, as described in Table 7.

Freight Rail Employee Profile

Keith Brinker has served CSX for 28 years, and works for the railroad in Jacksonville, Florida as manager of environmental remediation.



When Brinker transitioned to a position in Georgia, the railroad was not consistently using the same chemicals, cleaners and petroleum products. Brinker led an effort to reduce the number of chemicals and cleaners in use from 65 to 16, lowering concentrations of potentially harmful chemicals and reducing employee exposure, generation of hazardous waste and the chemical load on the railroad's wastewater treatment plants. His efforts and introduction of safer chemicals eliminated the use of chlorinated solvents system-wide.

For this and an outstanding track record of environmental excellence throughout his career, Brinker won the rail industry's North American Environmental Employee Excellence Award in 2006.

Freight Rail Employee Profile

Donald L. Robey has been in the railroad industry for 28 years and currently is director of locomotive engineering for CSX in Jacksonville. Robey designed, piloted and implemented a horsepower reduction program for 132 retrofitted locomotives. Over five years, it is estimated this technology will reduce fuel consumption by 12.5 million gallons and greenhouse gas emissions by almost 100,000 tons, an achievement for which Robey won the 2007 Chafee Award, given to rail workers for exceptional individual efforts in environmental stewardship.



not precisely indicative of the true impact. For example, policy restrictions on the kinds or quality of jobs created and specific policy targeting of job creation would lead to different outcomes than estimated here. The numbers presented here compose an estimated baseline for policy makers to consider.

Recommendations

There are several policy approaches that would bolster the freight rail industry's ability to create jobs to support a rebounding American economy. Continued and expanded investment in rail infrastructure would also capitalize on potential for much greater transportation efficiency and reduced pollution from the transportation sector. Tax incentives reduce the cost of investments, helping economically viable projects get built sooner and thereby accelerate employment creation and public benefits. By targeting specific outcomes, such as generating levels of employment or expanding transportation system capabilities, policymakers can limit the scope and duration of tax credits to achieve the intended effect. Furthermore, tying investments to outcomes would help remove much of the risk of wasting incentives on economically unjustified projects.

We propose the following set of policy recommendations to help the freight rail industry expand and meet the demands of a low-carbon economy:

- **A tax credit for rail capital investments.** Ideally, all businesses that make capacity-enhancing rail investments, in addition to the railroads, would be eligible for these incentives. While tax credits would offset potential government revenues, U.S. Department of Commerce data suggest that every \$1 of rail infrastructure investment generates more than \$3 in economic output.^{xxx} Such a tax credit could be targeted to support freight rail capacity expansion specifically, which in recent years represents about 25 percent of total freight rail capital investment. The economic model detailed in this report suggests approximately 7,800 'green' jobs, and a total impact of 12,300 to 26,600 jobs are generated or sustained per billion dollars of capital investment.

- **Renewal of the expired short line tax credit for short line and regional railroads.** This existing tax credit, which lapsed in 2009, has created or sustained more than 125,000 jobs, and enabled \$330 million in short line track upgrades necessary for regional carriers to match freight cars with the larger, heavier cars utilized by Class I railroads for long-distance hauls. This credit also supports thousands of jobs in the steel and rail construction industries.
- **Develop public-private partnerships between freight railroads and passenger rail.** These partnerships can greatly expand the use of rail 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 (which would increase travel options and also contribute to a lower carbon transportation system), as well as private benefits for freight rail by enabling faster, more reliable train operations.

In other cases, a public entity may contribute a portion of the initial investment required to make a project feasible, with the railroad responsible for funding all future maintenance and operations to sustain the project over time. In all cases however, we must ensure oversight is in place to ensure public financing is tied to public benefit outcomes.

Freight Rail Employee Profile

John Rebillet is a pipefitter for the Burlington Northern Santa Fe railroad (BNSF) and member of the Sheet Metal Workers International Alliance (Local 259). He has worked for BNSF for 19 years and is currently employed at the Alliance Mechanical Facility in Alliance, Nebraska.



Rebillet enjoys "keeping up with the changes in locomotive technology" and also serves as the union's Local Chairman to advance the interests of his fellow railway workers.

The Alliance Mechanical Facility is one of the largest repair facilities within the BNSF system, with about 600 employees who perform scheduled and unscheduled maintenance on the railroad's locomotives. Keeping locomotives in good repair has been crucial in helping the freight rail industry achieve a 38 percent increase in fuel efficiency since 1990. Freight rail carries twice the tonnage now as it did in 1980 without increasing system-wide fuel consumption (nearly 4 billion gallons annually).

Rebillet also owns a local store, where he recently installed high efficiency refrigeration to save energy, reduce pollution and cut costs.



A Greenbrier employee at their Tucson, AZ facility performs a repair on a freight railcar.

Freight Rail Industry Profile: The Greenbrier Companies

Headquarters: Lake Oswego, OR

Total Employees: 4,174

Locations: Dothan, AL; Pine Bluff, AR; Tucson, AZ; Modesto, CA; San Bernadino, CA; Golden, CO; Macon, GA; Red Oak, IA; Chicago Heights, IL; Peoria, IL; Atchison, KS; Kansas City, KS; Osawatomie, KS; Topeka, KS; Elizabethtown, KY; Hodge, LA; Kansas City, MO; Omaha, NE; Portland, OR; Springfield, OR; Lewistown, PA; Philadelphia, PA; Youngstown, PA; Cleburne, TX; Corsicana, TX; San Antonio, TX; Van Ormy, TX; Chehalis, WA; Finley, WA; Tacoma, WA

Company description: The Greenbrier Companies manufacture new freight cars as well as lease, manage, repair and refurbish existing freight cars. The company also produces and refurbishes freight car components. Greenbrier Rail Services offers the largest network of shops in North America.

Sustainable production: Greenbrier strives to create a healthy and safe working environment as well as to recycle and conserve resources and energy at every stage of the product life cycle.

The company is currently in the process of relocating a hydraulics facility to Red Oak, Iowa, consolidating two separate facilities into one to yield a smaller footprint. New systems have been installed to manage water used in the cleaning process to eliminate potential environmental contamination. In order to improve air quality for employees, the facility has internal structures within the larger facility to house welding units. The air and fumes from these structures are filtered and decontaminated before being converted to heat for the larger facility.

New freight cars: The combination of new high-strength and lightweight materials, innovative designs and advanced technologies creates lighter more efficient railcars. These new cars have nearly 20 percent greater capacity and can save millions of gallons of fuel over their lifecycles.

Public-private partnerships are prescribed in the Federal Rail Administration's (FRA) high-speed and intercity passenger rail programs. Under FRA's guidelines, states applying for federal grants for high-speed or intercity passenger rail are required to have written agreements with host freight railroads on safety, infrastructure capacity, compensation and liability issues in order to be eligible for federal funding. New programs could build upon this established framework to greatly expand benefits accruing from these partnerships.

- **Ensure policy promotes quality, homegrown employment opportunities.** In order to maximize the economic benefit of these investments and create quality jobs, we should ensure that any investment of taxpayer funds for freight rail investment include prevailing wage provisions to ensure that new jobs maintain the rail industry's relatively high level of pay and expand these benefits to more workers.

To uphold pay and benefit standards in the rail sector, the employees of anyone who owns, operates or maintains rail lines should be subject to relevant railroad laws (such as the Railroad Retirement Act and Railway Labor Act). If public-private partnerships and other measures alter employment arrangements, current collective bargaining agreements must be respected and successorship rights must be provided.

Also, policy approaches should incorporate domestic sourcing ("Buy America") requirements, which also hold potential to incorporate prevailing wage standards, to ensure these capital infusions benefit American workers, expand clean energy manufacturing, and amplify multiplier effects for both employment and investment within the domestic economy.



America's freight rail providers comprise a \$65 billion a year industry with 180,000 employees, such as these workers coordinating train activity at a Union Pacific dispatch center.

Conclusion

Over the past two centuries, rail has helped America realize its potential and become the world's leading economic power. In this new century, rail's eminence as an economic engine has the potential to be as great, and also produce significant energy savings, reduce pollution, move cargo across the country efficiently as part of a multi-modal freight network, and create an estimated 7,800 green jobs per billion dollars invested.

The recent recession, and the massive job loss that accompanied it, shows that a status quo approach will not suffice if America is to leave the 21st century stronger than when it entered. A truly balanced transportation network that achieves higher efficiencies among passenger and freight modes will help create an infrastructure platform that makes America more competitive in the global economy. Freight rail occupies an important role in this multi-modal network, and merely maintaining share within a growing freight market would forego the significant opportunities presented by rail's demonstrated ability to reduce oil consumption, achieve system and vehicle efficiencies to reduce pollution, as well as create and sustain quality employment throughout the economy.

Freight rail expansion would create thousands of quality green jobs and induce overall employment and economic growth while strengthening many of America's goods-producing industries. Furthermore, freight rail has already demonstrated its ability to achieve significant efficiencies resulting in lower fuel use and reduced pollution; increased investment would advance this progress, which has doubled the overall industry's efficiency in a few decades. As America moves full speed ahead to a clean energy economy, freight rail's crucial role in that transition can be expanded through sound policy choices that maximize the public and economic benefits of this industry.



By targeting specific outcomes, such as generating levels of employment and/or expanding transportation system capabilities, policymakers can limit the scope and duration of tax credits to achieve the intended effect.



A Reidler Decal employee helps fabricate a train marking for a freight railcar.

Freight Rail Industry Profile: Reidler Decal Corporation

Headquarters: St. Clair, PA

Total Employees: Fluctuates between 50-180

Locations: Charlotte, NC; Dallas, TX

Company description: The Reidler Decal Corporation, founded in 1926, is the oldest and largest fabricator of markings and signage for the railroad industry. Reidler operates a 60,000-square foot headquarters and factory in St. Clair (northeastern Pennsylvania), and with the decline of mining in the region, the company provides new employment opportunities. The Reidler family is in the third generation of ownership and most employees have been with the company for their entire working lives.

Supporting the rail industry: Rising levels of freight movement means new car builds and new repairs — equating to more demand for Reidler's services and more employees. Expanding rail capacity would mean more opportunities for Reidler Decal, and companies like it, to outfit new generations of specialized cars, as well as facilitate faster, more efficient movement of freight and access to new markets.

References

- i *Positive job growth, but not enough to reduce unemployment rate*, Heidi Shierholz/Economic Policy Institute, 2 April 2010.
- ii *Labor market closes 2009 with no sign of robust jobs recovery*, Heidi Shierholz/Economic Policy Institute, 8 January 2010.
- iii *The State of Working America 2008/2009*, Larry Mishel, Jared Bernstein, and Heidi Shierholz/Economic Policy Institute. Ithaca, N.Y.: ILR Press (an imprint of Cornell University Press), 2009, pg. 184.
- iv *The importance of manufacturing: Key to recovery in the states and the nation*, Robert E. Scott/Economic Policy Institute, March 2008.
- v Mishel, Bernstein, and Shierholz, pg. 202-203.
- vi *Capitalizing on the Upcoming Infrastructure Stimulus*, CIBC World Markets, January 2009.
- vii *United States Energy Profile*, U.S. Energy Information Agency (U.S. EIA), 18 August 2009; *How Dependent Are We on Foreign Oil?* U.S. EIA, 23 April 2009.
- viii *Biofuels: DOE Lacks a Strategic Approach to Coordinate Increasing Production with Infrastructure Development and Vehicle Needs*, General Accounting Office, Report number GAO-07-713, 11 June 2007.
- ix *U.S. Imports by Country of Origin*, U.S. EIA, April 2010; *National Transportation Statistics: Table 4-6 - Energy Consumption by Mode of Transportation*, Bureau of Transportation Statistics (BTS), September 2009.
- x *Freight Analysis Framework*, Federal Highway Administration Office of Freight Management and Operations, 2006.
- xi *Rail Intermodal Transport*, American Association of Railroads, June 2008.
- xii *National Rail Freight Infrastructure Capacity and Investment Study*, Cambridge Systematics, September 2007.
- xiii *Transportation For Tomorrow*, National Surface Transportation Policy and Revenue Commission, December 2007.
- xiv *Railroad Rate Studies*, U.S. Department of Transportation Surface Transportation Board, 2009.
- xv *Comparative Evaluation of Rail and Truck Fuel Efficiency on Competitive Corridors*, ICF International (for the Federal Railroad Administration), November 2009.
- xvi *National Transportation Statistics: Table 4-14 - Combination Truck Fuel Consumption and Travel, Table 4-17 - Class I Rail Freight Fuel Consumption and Travel, Table 1-46a - U.S. Ton-Miles of Freight*, BTS, 2008-2009.
- xvii *Railroad Rate Studies*.
- xviii *Transportation for Tomorrow*.
- xix *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008*, U.S. Environmental Protection Agency (U.S. EPA), April 2010.
- xx *EPA Analysis of the Transportation Sector Greenhouse Gas and Oil Reduction Scenarios*, U.S. EPA, 10 February 2010.
- xxi *Capital Spending — R-1 Schedule 330, Column (e); Final Demand Multipliers*, U.S. Department of Commerce, Regional Input-Output Modeling System (RIMS) II.
- xxii *Current-dollar and “real” GDP*, Bureau of Economic Analysis, March 2010.
- xxiii RIMS II.
- xxiv *Occupational Employment Statistics*, U.S. Department of Labor Bureau of Labor Statistics (BLS), December 2008.
- xxv *Nominal dollar based domestic employment requirements table 2008*, BLS, 10 December, 2009.
- xxvi *Fiscal Policy Roadmap*, Mark Zandi/Moody's Economy.com, 19 October 2009, pg. 4.
- xxvii *Estimated Impact of the American Recovery and Reinvestment Act on Employment and Economic Output From October 2009 Through December 2009*, Congressional Budget Office, February 2010, Table 2.
- xxviii RIMS II.
- xxix Since 1979, unionization rates have fallen by more than half, from 27 percent of the workforce to 12.3 percent. Also, college workers earned wages that were 50 percent higher than those of non-graduates (holding other worker characteristics constant), while by 2007 that advantage had risen to 80 percent. Research by DiNardo, Fortin, and Lemieux shows how this has led to greater wage inequality: *Labor market institutions and the distribution of wages, 1973-1992: A semi-parametric approach*, John DiNardo, Nicole M. Fortin, and Thomas Lemieux, *Econometrica*. Vol. 64, September 1996, pp. 1001-1044.
- xxx RIMS II.

Authors:

Rob McCulloch, BlueGreen Alliance/Legislative Advocate for Transportation and Transit Issues

Ethan Pollack, Economic Policy Institute/Policy Analyst

Jason Walsh, BlueGreen Alliance/Director of Policy and Strategic Partnerships

The authors would also like to thank the following for their editorial and technical assistance:

Brendan Danaher, AFL-CIO Transportation Trades Department/Legislative and Policy Representative

Dave Foster, BlueGreen Alliance/Executive Director

Kate Gordon, Center for American Progress/Vice President of Energy Policy

Frank Hardesty, American Association of Railroads/Assistant Vice President - Policy and Economics

Daniel Keen, American Association of Railroads/Assistant Vice President - Policy Analysis

Deron Lovaas, Natural Resources Defense Council/Federal Transportation Policy Director

Ann Mesnikoff, Sierra Club/Green Transportation Campaign Director

Kelly Schwinghammer, BlueGreen Alliance/National Communications Director



