

Railroads: Building a Cleaner Environment

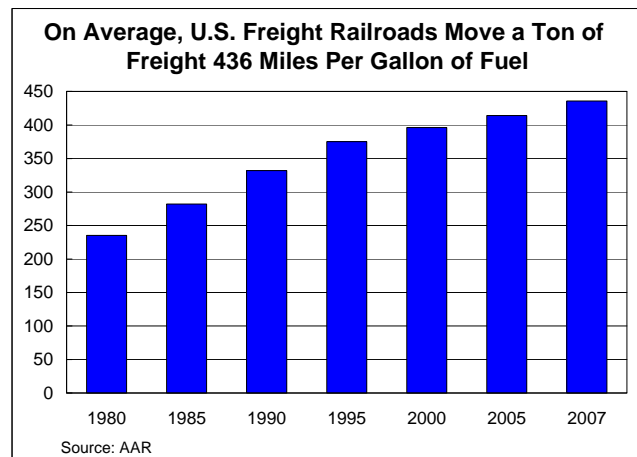
Summary

By relieving highway gridlock and reducing pollution, fuel consumption, and greenhouse gas emissions, railroads are the environmentally-friendly way to move freight. Through new technologies, advanced R&D, innovative operating practices, employee training, and steadfast compliance with environmental laws and regulations, railroads are committed to continued environmental excellence.

Railroads Are the Most Fuel-Efficient Form of Ground Transport

Using freight railroads more means consuming fuel less, and that's important today more than ever.

- In 2007, freight railroads moved a ton of freight 436 miles, on average, per gallon of fuel consumed — roughly the distance from Boston to Baltimore or Chicago to Minneapolis.
- Railroads are three or more times more fuel efficient than trucks. And according to the most recent data compiled by the Oak Ridge National Laboratory for the U.S. Department of Energy, railroads' energy intensity (measured in Btu per ton-mile) is 337, compared with 514 for barges.
- Freight railroad fuel efficiency has risen 85 percent since 1980. In 2007 alone, Class I freight railroads used 3.5 billion fewer gallons of fuel — and emitted nearly 39 million fewer tons of carbon dioxide — than they would have if their fuel efficiency had remained constant since 1980.
- In fact, from 1980 through 2007, Class I railroads consumed 48 billion fewer gallons of fuel and emitted 538 million fewer tons of carbon dioxide, than they would have if their fuel efficiency had not improved. In 2007, U.S. Class I freight railroads consumed approximately 4.1 billion gallons of fuel.
- If just 10 percent of the freight that currently moves by truck were diverted to rail instead, fuel savings would exceed one billion gallons per year.

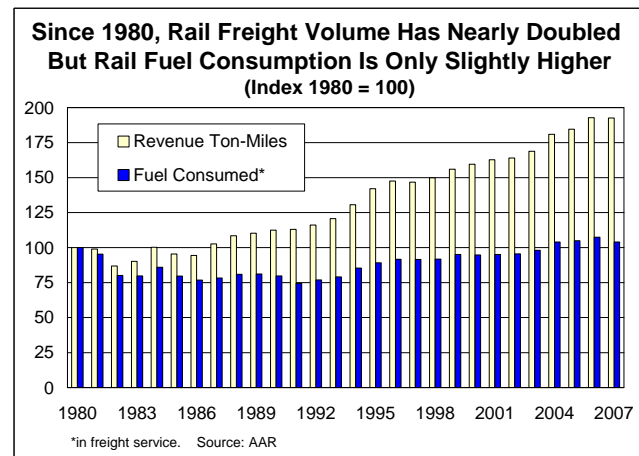


Railroads Are Constantly Finding New Ways to Conserve Fuel

Railroads are investing heavily in “cleaner and greener” technologies and other efforts to further improve their fuel efficiency:

- New locomotives. Railroads have spent billions of dollars in recent years on thousands of new, more environmentally-friendly locomotives. They have also overhauled thousands of older locomotives to improve their environmental performance.

Some of the new locomotives are fuel-saving “genset” units for use in rail yards. Gensets have two or three independent engines that cycle on and off, depending on need. Other switching locomotives are hybrids with a small fossil-fueled engine in addition to a bank of rechargeable batteries. Research is ongoing on hybrid long-haul locomotives that would store the energy generated by dynamic braking in batteries.



- Train handling. In part, railroad fuel efficiency depends on how well an engineer handles a train. That’s why railroads use the skills of their engineers to save fuel. For example, many railroads offer training programs through which engineers and simulators provide fuel-saving tips. On some major railroads, the fuel consumption performance of participating engineers is compared, with awards given to the top “fuel masters.”

In addition, railroads are using sophisticated on-board monitoring systems to gather and evaluate information on location, topography, track curvature, train length and weight, and more to provide engineers with real-time “coaching” on the best speed for that train from a fuel-savings standpoint.

- Information technology. Many railroads use advanced computer software to improve their fuel efficiency. For example, sophisticated modeling tools identify the best way to sequence cars in a large classification yard. Railroads also use innovative “trip planning” systems that automatically analyze crew and locomotive availability, track congestion, the priority of different freight cars, track conditions, and other variables to optimize how and when freight cars are assembled to form trains and when those trains depart. The result is smoother traffic flow, better asset utilization, and reduced fuel use.
- Idle reduction technology. Locomotives often have to idle when not in use to prevent freezing, provide for crew comfort, or for other reasons. However, many railroads have voluntarily installed idle-reduction technology that allows main engines to shut down under certain conditions. One advantage of “genset” locomotives is that their smaller engines use anti-freeze, allowing them to shut down in cold weather. Some railroads also use “auxiliary power units” to warm engines so that locomotives can be shut down in cold weather.

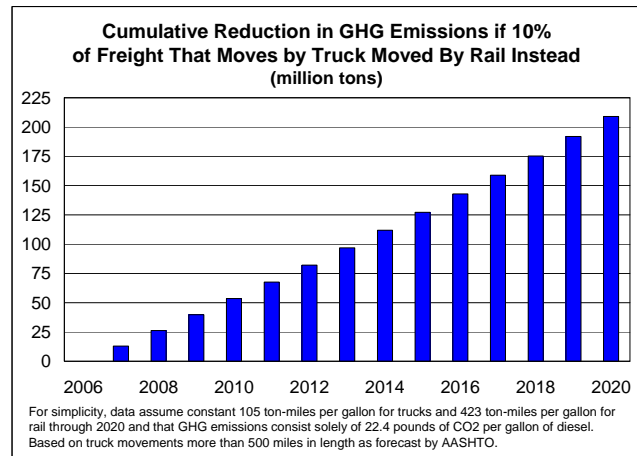
- Components and design. Railroads use innovative freight car and locomotive components and designs to save fuel. For example, advanced lubrication techniques save fuel by reducing friction; improving the aerodynamic profile of trains saves fuel by reducing drag.

Freight Railroads Help Reduce Greenhouse Gas Emissions

Moving more freight by rail is a clear-cut way to reduce greenhouse gas emissions:

- Because railroads are, on average, three or more times more fuel efficient than trucks, and because greenhouse gas emissions are directly related to fuel consumption, every ton-mile of freight that moves by rail instead of truck reduces greenhouse gas emissions by two-thirds or more without negatively impacting our economy or requiring investments in new technologies.

- If 1 percent of long-haul freight that moves by truck moved by rail instead, annual greenhouse gas emissions would fall by 1.2 million tons, based on data from the American Association of State Highway and Transportation Officials. If 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.

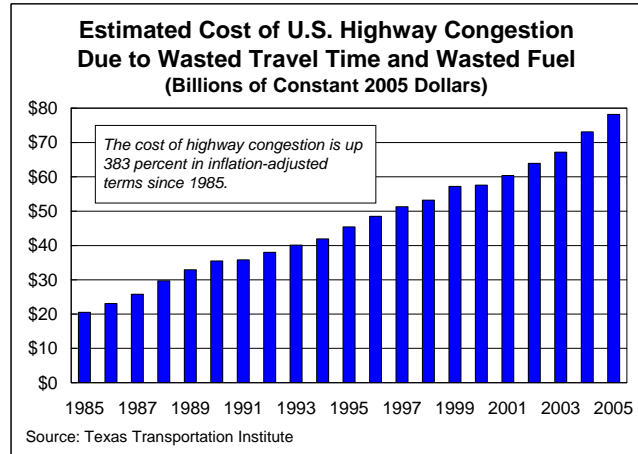


- The seven largest U.S. freight railroads have all joined the EPA’s “SmartWay Transport,” a voluntary partnership between shippers, freight transporters, and the EPA that establishes incentives for fuel efficiency improvements and greenhouse gas reductions. The initiative is designed to reduce annual carbon dioxide emissions by 36 to 73 million tons and nitrogen oxide (NO_x) emissions by up to 220,000 tons. As part of the partnership, each railroad has committed to evaluating the environmental impacts of its operations and agreed to work with the EPA to develop and implement plans to further improve fuel efficiency and reduce emissions.
- Freight railroads account for just 2 percent of total U.S. greenhouse gas emissions from transportation and mobile sources, and well under 1 percent of total greenhouse gas emissions from all sources.

Railroads Fight Highway Congestion

- Because a typical freight train takes the equivalent of several hundred trucks off our highways, freight railroads significantly reduce highway congestion.
- According to the Texas Transportation Institute’s 2007 Urban Mobility Study, the annual cost of highway congestion in the United States is \$78 billion just in wasted travel time (4.2 billion hours) and wasted fuel (2.9 billion gallons). The total costs of congestion are far higher if lost productivity, costs associated with cargo delays, and other costs are included.

- Building more highways is incredibly expensive and time consuming. Given budget constraints and other factors, it is highly unlikely that we will be able to build our way out of highway gridlock. Shifting freight from trucks to rail helps reduce the costs of maintaining existing roads and the pressure to build costly new roads.



- Freight railroads recognize the potential public benefits of passenger rail service to relieve highway congestion, and they work to accommodate passenger trains when mutually-beneficial arrangements can be negotiated.

Railroads Are On Track With Emissions Control

- 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.

- In March 2008, the EPA issued stringent new locomotive emissions guidelines that, when fully implemented, will cut particulate matter emissions by locomotives by as much as 90 percent and nitrogen oxide

Rank (1= Most Desirable)	Oxides of Nitrogen	Volatile Organic Compounds	Particulate Matter	Carbon Monoxide	Carbon Dioxide
1	Rail	Rail	Air	Rail	Rail
2	Water	Water	Rail	Water	Water
3	Truck	Air	Water	Air	Truck
4	Air	Truck	Truck	Truck	Air

Source: Envirotrans

(NOx) emissions by as much as 80 percent compared to locomotives meeting the most stringent standards set in 1998. The new standards will also yield sizeable reductions in emissions of hydrocarbons, carbon monoxide, and other air toxics.

The new EPA rule sets emissions standards for newly-built locomotives based on the use of high-efficiency after-treatment technology beginning in 2015; tightens the standards for existing locomotives when they are remanufactured; and sets idle reduction requirements for new and remanufactured locomotives.

- Although it will not be easy for railroads and locomotive builders to meet the EPA's new emissions standards, in the past they have achieved emissions and energy efficiencies beyond those initially contemplated. Railroads believe they and their suppliers are up to the challenge.