

# The Environmental Benefits of Moving Freight by Rail

ASSOCIATION OF AMERICAN RAILROADS

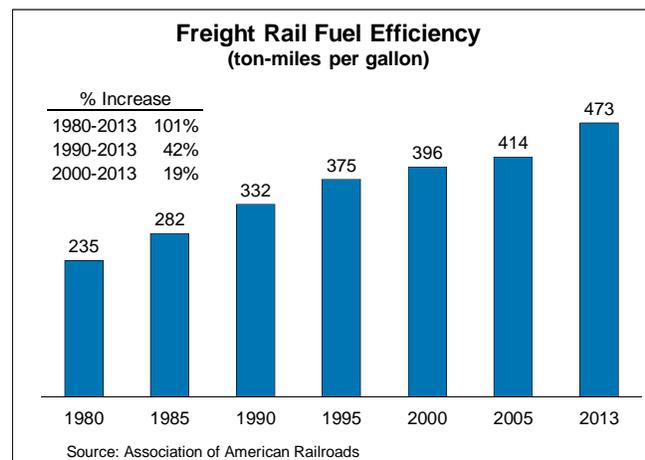
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## Summary

Railroads are the most environmentally sound way to move freight over land. On average, **trains are four times more fuel efficient than trucks.** They also **reduce highway gridlock, lower greenhouse gas emissions, and reduce pollution.** Through the use of greener and cleaner technologies and more efficient operating practices, our nation's privately owned freight railroads are committed to even greater environmental excellence in the years ahead.

## Freight Railroads and Fuel Efficiency Go Hand in Hand

- In 2013, U.S. freight railroads moved a ton of freight an average of **473 miles per gallon of fuel** — up from 235 miles in 1980. **That's a 101 percent improvement.**
- On average, railroads are **four times more fuel efficient than trucks**, according to an independent study for the Federal Railroad Administration.
- Greenhouse gas emissions are directly related to fuel consumption. That means **moving freight by rail instead of truck lowers greenhouse gas emissions by 75 percent.**
- If just 10 percent of the long-distance freight that moves by truck moved by rail instead, fuel savings would be approximately **one billion gallons per year** and **greenhouse gas emissions would fall by more than 10 million tons** — equivalent to taking nearly 2 million cars off the road or planting around 240 million trees.



## Freight Railroad Innovations Help the Environment

Rail freight volume is nearly double what it was in 1980, but railroads' fuel consumption is about the same. How did railroads do this? Through technological innovations, new investments, improved operating practices, and a lot of hard work, including:

- **Increasing the amount of freight in an average rail car.** Thanks to improved freight car design and other factors, the average freight train carried 3,488 tons of freight in 2013, up from 2,222 tons in 1980, 2,755 tons in 1990, and 2,923 tons in 2000.

- Acquiring thousands of **new, more efficient locomotives**, including many “**gensets**” that have several independent engines that turn on and off depending on how much power is needed to perform a particular task. Many older, less fuel efficient locomotives have been retired from service.
- Installing new idling-reduction technologies, such as **stop-start systems** that shut down a locomotive when it is not in use and restart it when it is needed.
- 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.
- Offering **employee training** and **incentive programs** to help locomotive engineers develop and implement best practices and improve awareness of fuel-efficient operations.
- 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.

### Freight Railroads Fight Highway Gridlock

Railroads help reduce the huge economic costs of highway congestion:

- According to the Texas Transportation Institute, in **2011 highway congestion cost Americans \$121 billion** in wasted time (5.5 billion hours) and wasted fuel (2.9 billion gallons). Lost productivity, cargo delays, and other costs add tens of billions of dollars to this tab.
- **A single freight train, though, can replace several hundred trucks**, freeing up space on the highway for other motorists.
- Shifting freight from trucks to rail also **reduces highway wear and tear and the pressure to build costly new highways**.



### Freight Railroads Mean Less Pollution

Moving freight by rail rather than by truck significantly reduces harmful emissions. In March 2008, the EPA issued stringent new locomotive emissions standards. The EPA estimates that, when compared to the previous standards, the new standards will:

- Reduce particulate matter (PM) emissions by 90 percent; and
- Reduce nitrogen oxide (NOx) emissions by 80 percent.