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Is Rail Really a Fuel Saver? (rethinking a rationale for Obama's National Transportation Plan)

by Randal O'Toole

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[Editor Note: Transportation expert Randal O'Toole is a [senior fellow](#) of the Cato Institute and blogs at [AntiPlanner](#). His bio is at the end of this post.]

[Amtrak](#), the [American Public Transportation Association](#), and other passenger-rail advocates want everyone to believe that passenger trains are more energy efficient than driving. This helps them justify the hundreds of billions of tax subsidies they receive. *But is this rationale true?*

Comparing the Studies

A [new study](#) from the University of California (Davis) finds that the answer depends on such things as load factors: your auto carrying four people consumes a lot less energy per passenger mile than a subway (which on average is only one-sixth full) or Amtrak train (which on average is only half full).

The Department of Energy's [Transportation Energy Data Book](#) says that, on average, cars consumed about 3,500 British thermal units (BTUs) per passenger mile in 2006, while Amtrak used 2,650 and rail transit (including light rail, subways, and elevateds) just under 2,800 (see tables 2.13 and 2.14). But this doesn't mean your hometown should build light rail or be connected to a national high-speed rail line.

For one thing, the national averages for rail transit are heavily weighted by the New York City subway, which by itself carries more than 55 percent of all rail transit passenger miles and which consumes only 2,150 BTUs per passenger mile. When rail transit lines are evaluated individually (as I did in a recent Cato Institute [report](#)), the vast majority consume more BTUs per passenger mile than the average auto.

Almost no rail transit lines in the country are as energy-efficient as a Toyota Prius, which consumes about 1,650 BTUs per passenger mile. This confirms something the late economist Charles Lave wrote in the [Atlantic Monthly](#) in 1979: efforts to save energy will be more effective if they focus on increasing the energy efficiency of the kind of transportation people use most — automobiles — rather than trying to get people to take transit instead of driving.

A different correction is needed when comparing driving with high-speed rail. The [Transportation Energy Data Book](#) assumes the average car carries 1.57 people. The Center for Clean Air Policy used an average of 1.6 people per car in its [analysis](#) concluding that high-speed trains will reduce CO₂ emissions by 6 billion pounds per year.

The 1.6-people-per-car figure applies to all auto travel, two-thirds of which takes place in cities. But according to an [independent analysis](#) prepared for the California High-Speed Rail Authority, the average automobile in intercity travel carries 2.4 people, which means it consumes only 2,300 BTUs per passenger mile.

“Intercity auto trips tend to [have] higher-than-average vehicle occupancy rates,” said another Department of Energy [report](#) in 2001. “On average, they are as energy-efficient as rail intercity trips.” Moreover, the report added, “if passenger rail competes for modal share by moving to high speed service, its energy efficiency should be reduced somewhat — making overall energy savings even more problematic.”

Outside the Boston-to-Washington corridor and a few other places, most Amtrak trains have top speeds of 79 miles per hour. Boosting them to 110 mph, as the Obama [high-speed rail plan](#) proposes to do, will greatly increase their energy consumption. This means high-speed trains will be less energy efficient unless the higher speeds attract more riders per train.

The Center for Clean Air Policy's report assumed that all high-speed trains would be 70 percent full. This is extremely optimistic: in 2008 — a banner year for Amtrak — the average Amtrak train was only [51 percent full](#) (see p. C-1 and divide contribution per seat mile by contribution per passenger mile). The Acelas, Amtrak's fastest trains, were 62 percent full, but Amtrak's 110-mph Boston-to-Washington trains were only 48 percent full, while its 110-mph Philadelphia-Harrisburg trains were only 34 percent full. Only two Amtrak trains, neither very fast, were more than 70 percent full in 2008, and both were less than 70 percent full in 2007.

Some of the least energy-efficient vehicles in America are public transit buses, which the *Transportation Energy Data Book* says consume about 4,200 BTUs per passenger mile. On the other hand, some of the most-energy efficient motor vehicles are private intercity buses, which the American Bus Association says consume only about [750 BTUs](#) per passenger mile (and if you don't trust that source, DOE estimates are even lower).

What's the difference? Private intercity bus companies have an incentive to fill up their coaches. But public transit agencies (along with Amtrak) are politically driven to serve all taxpaying areas, regardless of the demand or population density.

Conclusion

If environmental groups really wanted to save energy, they would advocate strategies to privatize transit, privatize Amtrak, and sell highways to private entrepreneurs who would have an incentive to relieve the congestion that wastes [nearly a billion gallons of fuel each year](#). The real goal of at least some environmentalists, however, is not to save energy, but to reshape American lifestyles. They just can't stand to see people enjoying the freedom of going where they want to go, when they want to get there.

This contradiction should inspire internal debate and external reform.

Randal O'Toole specializes in the areas of urban growth, public land, and transportation issues. His research on national forest management culminated in *Reforming the Forest Service* (1988), which had a major influence on Forest Service policy and on-the-ground management. His analysis of urban land-use and transportation issues, brought together in his *The Vanishing Automobile and Other Urban Myths* (2001) has influenced decisions in cities across the country.

His most recent book, *The Best-Laid Plans*, calls for repealing federal, state, and local planning laws and proposes reforms that can help solve social and environmental problems without heavy-handed government regulation.

O'Toole travels extensively and has spoken about free-market environmental issues dozens of cities. An Oregon native, O'Toole was educated in forestry at Oregon State University and in economics at the University of Oregon.

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