

opinion

Prius effect: Energy-efficient cars undercut the appeal of light rail

By Chuck Plunkett

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Light rail — useful from the gritty-aired 1970s to not so long ago, when cars drank gasoline like frat boys drink beer — is now obsolete, and a transportation option that our environment can no longer afford.

That's right. Unless we change energy sources or greatly increase light-rail ridership, we should just drive our cars to work instead.

Automobiles are becoming more fuel efficient at a much faster rate than light rail, which gets its power largely from carbon-spewing power plants. That regrettable, counter-intuitive fact is an unintended consequence of "the Prius Effect," as the rise of hybrids and increasingly fuel-efficient cars outstrips the environmental benefits of light rail.

The technology change raises critical questions

about the future of FasTracks.

For the record, I have long been a fan of rail. But after reading a national study that documented light rail's dangerous impact on the environment, I asked its author, Cato Institute scholar Randal O'Toole, to help me study light rail in Denver.

(Also for the record, mass transit advocates argue that O'Toole is hostile to light rail. He is. But he's reasoned in his opposition, and I haven't succeeded in debunking his central findings.)

I sent O'Toole light-rail ridership and miles-traveled data from the Regional Transportation District for 2008. Due to high gas prices last summer, it was a record-setting year for light rail.

RTD gets its electricity for its light-rail cars from Xcel Energy, which in 2008 powered its Colorado grid with a 57 percent mix of coal and 31.5 percent mix of natural gas. O'Toole combined the data with calculations from scientists at the Energy Information Agency (a component of the U.S. Department of Energy). He then broke out an apples-to-apples comparison of the CO2 footprint of a single rider using metro Denver light rail and 2008 model cars.

The result for one rider going 1 mile (i.e., "passenger mile"): Passenger mile per passenger mile, Denver's light-rail cars pump 0.59 pounds of CO2 into the atmosphere. Passenger cars, such as sedans, average 0.54 pounds, and the Toyota Prius just 0.26 pounds.

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That means for every million passenger-miles traveled in Denver, light rail puts 50,000 more pounds of CO2 into the atmosphere than passenger cars do.

O'Toole's findings do show that the average CO2 output of passenger trucks and SUVs and passenger cars combined is slightly above RTD's light rail, by 0.02 pounds. But RTD is fast losing that minuscule advantage. One reason is because light-rail ridership in Denver is low. About 14 passengers per mile occupy RTD's light-rail cars, compared to a national average of about 24.

If RTD could lure many more riders per line, its CO2 level per passenger mile would drop. But the projections don't look good on that front.

The Denver Regional Council of Governments says that all transit — which includes light rail and the more well-used bus system, accounted for 2 percent of trips in Metro Denver in 2005. DRCOG projects in 2035, after FasTracks is complete, all transit will account for just 2.9 percent of trips.

Another factor is where the energy comes from. In Portland, Ore., more heavily used light-rail cars are fueled largely by hydropower, and their CO2 pollution falls far below passenger cars.

A problem with O'Toole's 2008 national study is that it uses statewide energy data — and not Xcel's — to calculate the Denver metro light-rail CO2 footprint. But in the analysis O'Toole conducted for this report, the calculations are

based on data from Xcel's energy portfolio, and so should be far more accurate.

The findings raise important questions about continuing the cash-strapped, \$7 billion FasTracks system. And the future looks grim: The Prius Effect will intensify with President Barack Obama's new requirement that cars average 35.5 miles per gallon by 2016.

(Note: The full FasTracks plan also calls for heavier commuter rail cars, which would be electrified with some running on diesel. RTD doesn't yet have them, so I wasn't able to do a comparison. However, because ridership issues and electrical generation play similar roles, it's doubtful they are a good option.)

O'Toole estimates that by 2020, the average mix of cars and passenger trucks and SUVs will emit 0.46 pounds of CO2 per passenger mile. That's a 24.6 percent decrease, which is far greater than estimated decreases in RTD's light rail emissions.

Xcel is required by state law to generate 20 percent of its electricity by 2020 from renewable energy, such as wind and solar. The utility already gets about 10 percent of its energy from renewables.

O'Toole ran the numbers for what 2008 would have looked like for light rail had Xcel powered its grid with a 20 percent mix of renewables. Light rail's carbon footprint would still be at 0.53 pounds of CO2 per passenger mile. That means for every million miles traveled, light rail would pump 70,000 pounds more of CO2 per passenger

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mile than cars and trucks.

So in 2020, new automobiles will have cut their emissions by 24.6 percent, while RTD's light rail would cut them by only 10.2 percent, O'Toole found.

RTD officials argue that O'Toole's starting point is misleading. By focusing solely on 2008 models, O'Toole isn't looking at the actual mix of cars on metro streets, says Scott Reed, RTD's assistant general manager for public affairs.

O'Toole's analysis "is clearly flawed in that way," Reed said, saying the study O'Toole helped me put together compares "apples to orangutans."

That's somewhat true, but only to a point. When considering long-range planning and what's best for the skies over metro Denver, it is more than fair to compare today's technology against Denver's light-rail system going forward.

Consider that by 2030, older gas-guzzlers will have made their way into the junkyard and pretty much everyone will be driving cars that meet President Obama's standards.

Automobiles would pump only 0.38 pounds of CO2 per passenger mile, or 150,000 pounds less per million passenger miles than RTD's light-rail cars using 20 percent renewable energy.

Another factor is the environmental impact caused by building light-rail lines. In his 2008 study, O'Toole pointed out that forging the materials and building light-rail systems creates

an enormous amount of CO2 .

Consider Portland. Hydropower makes it the most environmentally friendly light-rail system in the nation, with a CO2 footprint of just 0.08 pounds per passenger mile. But estimates show it would take the super-efficient light-rail system 172 years to erase the CO2 created to build its North Interstate light-rail system.

Obviously, the system won't last that long before it requires new construction, thereby moving the carbon-reduction goalpost farther away.

O'Toole argues that if reducing greenhouse gases is a goal in public transportation, buses make more sense. Because buses are generally replaced every 10 years, cities can take advantage of newer technology that is more energy-efficient. On the other hand, light-rail cars are replaced every 30 years.

Supporters of light rail — like RTD's acting general manager, Phillip Washington — argue the urban hubs that spring up around stations have many secondary benefits, creating communities that are more accessible by walking. "We're looking at economic benefits, too," Washington said.

That's true — but that would also be true of systems that worked with buses or other, more environmentally friendly technology.

Meanwhile, RTD's own projections show that only a sliver of the metro area will use light rail, largely negating the secondary benefits of the

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urban hubs.

The Prius Effect means that unless Xcel weans itself dramatically from coal and natural gas, further expanding rail in metro Denver would be an outrage.

Chuck Plunkett is a member of the editorial board. He can be reached at 303-954-1331 or cplunkett@denverpost.com.

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