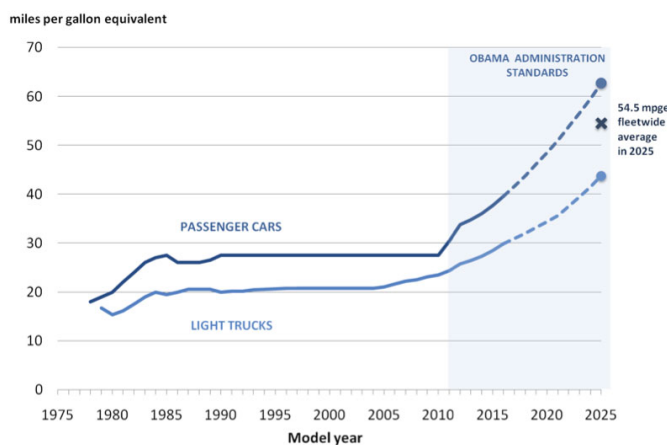


How conservative are the ridership forecasts?

Claim: The Authority used a conservative price of \$3.80 for regular gasoline in their model.

This is difficult to assess as the price of gas is not directly entered into the model. Instead, the forecasts use the fuel cost per mile of driving per person. The current estimate is \$0.29/ mile per person (using the 2005\$ figures given and the Consumer Price Index (CPI) adjustments provided). To derive the gas price, one must make assumptions about fuel efficiency and the number of people in the vehicle.

By law, cars will be getting much more efficient. New standards were adopted this summer that



mandate a 54.5 mpg average fleetwide efficiency for new cars and light trucks by 2025. It will take some time for people to replace their older, more gas guzzling cars but there should be a real improvement in fuel efficiency.

The other variable is how many people are in cars. The average group size was **2.415** for trips for all purposes by car and plane in California over 50 miles. Non-business trips are overwhelmingly made by groups.

Here is a chart we created that shows the price of gas per gallon for 200 mile trips in 2011\$ based on the HSRA model:

	15 mpg	20 mpg	25 mpg	30 mpg	40 mpg	50 mpg	60 mpg
1 passenger	\$4.35	\$5.80	\$7.25	\$8.70	\$11.60	\$14.50	\$17.40
2 passengers	\$3.48	\$4.64	\$5.80	\$6.96	\$9.28	\$11.60	\$13.92
3 passengers	\$5.22	\$6.96	\$8.70	\$10.44	\$13.92	\$17.40	\$20.88
4 passengers	\$6.96	\$9.28	\$11.60	\$13.92	\$18.56	\$23.20	\$27.84
5 passengers	\$8.70	\$11.60	\$14.50	\$17.40	\$23.20	\$29.00	\$34.80

The price per gallon of gas for 400 mile trips in 2011\$ (this is different due to group travel costs methodology):

	15 mpg	20 mpg	25 mpg	30 mpg	40 mpg	50 mpg	60 mpg
1 passenger	\$4.35	\$5.80	\$7.25	\$8.70	\$11.60	\$14.50	\$17.40
2 passengers	\$6.09	\$8.12	\$10.15	\$12.18	\$16.24	\$20.30	\$24.36
3 passengers	\$9.14	\$12.18	\$15.23	\$18.27	\$24.36	\$30.45	\$36.54
4 passengers	\$12.18	\$16.24	\$20.30	\$24.36	\$32.48	\$40.60	\$48.72
5 passengers	\$15.23	\$20.30	\$25.38	\$30.45	\$40.60	\$50.75	\$60.90

Why are these numbers so different from the \$3.80 per gallon that the Authority claims to be using?

1. **2005 dollars vs. current year dollars.** The Authority's numbers are in terms of 2005 dollars. Using the CPI adjustment factors provided by the Authority, the starting price in current dollars is **\$4.40**.
2. **\$2.40 per gallon fudge factor added.** The Authority tacked on an extra \$2.40 /gallon to account for non-fuel costs of driving such as depreciation and maintenance. While the cost of driving is definitely higher than just gas, this particular model was specifically estimated based on a survey that gauged people's sensitivities to the fuel only cost component of driving. Any sensitivity to other costs will already be reflected in the model variables. *Adding these costs during the calibration phase was a technical error*, compounded by the fact that the average family does not put much weight on these types of costs. According to the same consultants who developed this model, "Usually, auto travelers will consider their cost of travel to be only their out-of-pocket gas costs. Thus, in most intercity travel models, auto costs are generally in the range of \$0.10 to \$0.15 per mile. While higher per mile costs are more consistent with the true costs of driving (including operating, maintenance, and ownership costs), they are generally not considered by travelers for specific travel decisions."¹
3. **Costs not divided by the number of people in the car.** The model used an unorthodox method of adjusting the cost of driving per person. Instead of simply dividing the costs by the number of people, it gave a fixed credit (about \$40) to anyone who was traveling with one or more people. This credit represented both the cost savings of sharing the drive and a "road trip" effect that makes it more likely in general that groups will travel by automobile². However, the credit was not increased when the \$2.40 per gallon fudge factor was added, nor as the price of gas increased from the low prices when the survey was done in 2005. These two factors increased the price of driving in the model by 144%, without any commensurate adjustment in the credit.

Conclusion: In virtually every case, the ridership model uses a very high price of gas – considerably higher than the \$3.80 they claim. A family of four driving from the Bay Area to Disneyland in their Prius is assumed to pay \$40 per gallon of gas!

Why does it matter: In general, the high price of driving artificially inflates demand for the train and helps explain why in the CA HSR model, so much more ridership is diverted from autos than any other system currently in use around the world. This broken model makes the train look like the cheaper alternative for families and groups, which represent a large part of the future ridership.

¹Cambridge Systematics Desert Xpress Ridership Forecast Review February 29, 2008

² For our calculation of implied gas prices, we lowered the cost of group travel by 75% of the value of the group coefficient. From page 2-23 of the model documentation, "Those traveling with others were more likely to use auto modes and less likely to use air. This effect was also tested on the cost coefficients and not found to be significant, so this relative mode preference appeared to be related to more than just cost (such as the fact that people can share driving for long trips)."