

Incentives for Greener Transportation

BY RENEE HALTOM

North Carolina owners of cars with the newest environmentally friendly technologies can now drive on high-occupancy vehicle (HOV) lanes regardless of the number of passengers they carry. The new policies, signed into law in May and June of this year, are intended to encourage car buyers to choose plug-in electric vehicles and vehicles powered by certain alternative fuels. A small but growing number of states have similar HOV incentives for these types of vehicles.

The policies are somewhat ahead of the curve since those up-and-coming technologies are not yet widely available — unlike hybrid vehicles, which comprise about 3 percent of total vehicle sales (more than half of which are the popular Toyota Prius). Hybrids combine battery power with a gas-fueled internal combustion engine. HOV access for hybrids has been around in some areas since 2000, when Virginia became the first state to offer the incentive. Such policies are typically administered by a special marking — a sticker or a special license plate — available for purchase that authorities can watch for on vehicles traveling in HOV lanes.

The evidence is mixed on whether HOV access has been successful at spurring hybrid purchases. Of the five states that introduced HOV hybrid exemptions between 2000 and 2006, only in Virginia was there a positive and significant effect on hybrid purchases, according to economists Kelly Sims Gallagher at Tufts University and Erich Muehlegger at Harvard University.

Probably explaining Virginia's success, Muehlegger says, is that most of the area's HOV lanes exist in Washington, D.C. That area has what is commonly considered to be the worst traffic in the nation, making HOV access particularly valuable. (Los Angeles and San Francisco also tend to be included in lists of worst traffic areas, but California's program allocated 60 percent of its 85,000 HOV access stickers to people who already owned hybrids. That may explain why research has been unable to link HOV access to new purchases in that state.)

The lesson for policymakers might be that HOV access is most likely to change consumer behavior near extremely highly trafficked corridors. Usually, however, "HOV lanes are not the trigger that get people to buy a hybrid relative to a regular vehicle," Muehlegger says.

But consumers do seem to find HOV access valuable — and policymakers may be able to exploit that toward a positive end. Economists Sharon Shewmake at Vanderbilt University and Lovell Jarvis at the University of California, Davis, looked at California's program, which sold HOV access stickers between August 2005 and February 2007. They looked at the used car market for hybrids and found

that ones adorned with HOV-access stickers, which conveyed with the cars, sold for a premium to the average tune of \$625 for each year the buyer knew the HOV policy would be in effect. At that valuation, what the state sold for \$8 a pop could have generated \$270 million in revenue, they calculate.

By auctioning HOV access to the highest value users with *any* type of car, and using that revenue to encourage hybrid purchases via sales tax waivers, policymakers could both allocate HOV space to the people who value it most and encourage a greater number of hybrid purchases than HOV access has apparently been able to do, Shewmake and Jarvis argue. Based on estimates of the effectiveness of tax waivers to spur hybrid purchases, they further estimate that a sales tax waiver between \$1,000 and \$2,000 would have encouraged the same number of hybrid purchases as Virginia's policy did, with revenue left to spare.

Harvard's Muehlegger argues that the real hurdle to green car adoption is getting people comfortable with the technologies. For example, people were initially unsure about the long-run performance of hybrids — would the batteries eventually wear out? — but this problem receded as people observed more and more of their peers having positive experiences with hybrids.

Both of the technologies being promoted by the new North Carolina law are troubled by additional adoption hurdles. For plug-in electrics, consumers are worried about "range anxiety," or how far the car can go before requiring a charge-up. For alternative fuel vehicles, will fueling stations be widely available?

Policies that encourage these technologies could help to lower those adoption hurdles. But they also arbitrarily favor certain types of green technology over others. Most economists would ask: Why pass a law subsidizing one type of technology — say, hybrid vehicles or plug-in electrics — instead of a law that encourages *any* technology that yields environmental gains above a certain desired threshold?

And if the policy incentives don't prove enough to boost green technology, there's always vanity. One reason people might buy a Toyota Prius, with its unique, recognizable design, is the signal it sends to the driver's peers about that person's environmental enlightenment. Economists (and siblings) Steven and Alison Sexton, graduate students at the University of California, Berkeley, and the University of Minnesota, respectively, estimated that for people living in Colorado and Washington communities that are more "green" (as identified by voting preferences), this "green halo" was worth up to several thousand dollars per car, helping private markets produce what some consider to be a public good.

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