Alternative Fuels, Vehicle Technologies and Urban Logistics

Policy Note prepared by Maggie Witt

ISSUE

A central focus of technology is facilitating shifts from drive-alone vehicle trips to public transit, shared vehicles and rides, walking, and biking trips by providing transit riders with real-time vehicle location and arrival data and carpoolers with the ability to make shared ride arrangements on short notice. But while this technology facilitates some mode shifting, it is unlikely to result in large-scale changes, since many circumstances require the use of a car.

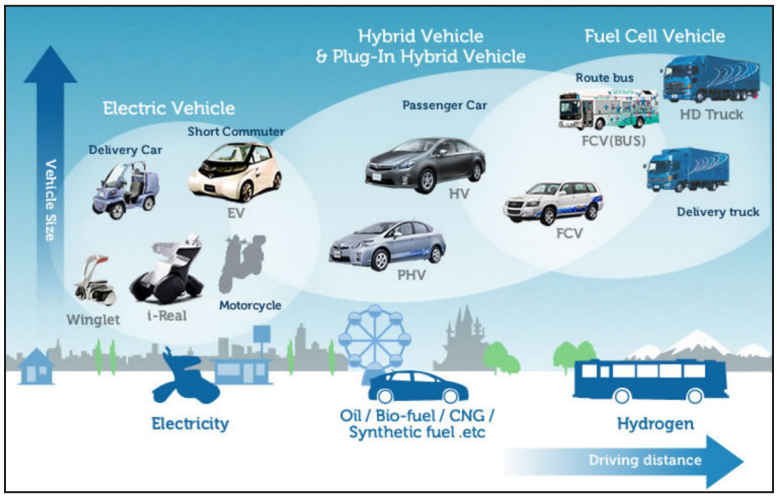

Figure 1. The spectrum of alternate-fuel vehicles by size and distance capabilities. Credit: Toyota

Alternative-fuel, advanced technology vehicles coupled with a new urban logistical infrastructure is a major pathway toward reducing transportation-related greenhouse gas (GHG) emissions and oil dependence. In California, the Global Warming Solutions Act, which requires that 36 percent of the state's GHG emission reductions come from transportation by 2050, is likely to spur adoption of this approach. The California Air Resources Board estimates that 87 percent of the California vehicle fleet will have to be powered by low or zero-carbon fuels to achieve this goal by the law's deadline. To make this substantial transition, consumer perceptions of these technologies and of vehicle ownership (e.g., acceptance of shared-used vehicles), government policies, and the urban infrastructure to support them will all have to be modified.

FINDINGS FROM THE PANEL

California Clean Mobility Project researchers at UC Berkeley's Transportation Sustainability Research Center have deployed 10 conventional Prius hybrid vehicles and 10 Prius plug-in hybrid vehicles (PHVs) in real-world driving situations in northern California. They hope to gain a more complete understanding of driver response to PHVs versus conventional hybrids, including different charging scenarios.

Carsharing and ridesharing are other alternatives that can reduce GHGs. Providing on-demand vehicle access to people who can make most trips without a car reduces the likelihood that they will purchase one, which in turn reduces their vehicle-miles traveled and the associated emissions.

One-way carsharing enables members to leave the shared vehicle at a location different from where they picked it up. Peer-to-peer carsharing, in which individual car-owners lend their cars to members of the peer-to-peer network, eliminates the need for centralized carsharing locations, facilitating penetration into suburban markets, and expanding urban markets. Growth in the popularity of collaborative consumption, which utilizes sharing, trading, and renting instead of ownership, is also facilitating growth in carsharing.

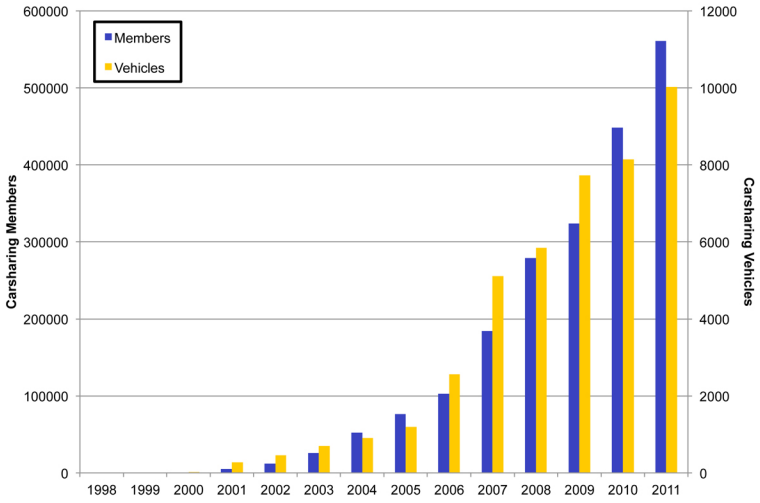

Figure 2. U.S. carsharing members and vehicles.
Credit: Shaheen and Cohen, Transportation Sustainability Research Center, 2011

Similarly, new technologies have increased the appeal of public bikesharing programs and made them more cost-effective and easier to manage.

Pilot programs have propelled rapid growth in carsharing and bikesharing programs. One exemplary bikesharing program is "Denver B-Cycle," which began in 2007 and has grown to 52 stations with 520 bikes supported by government and foundation grants, corporate subsidies, and user fees. New and innovative carsharing programs are being piloted, such as "car2go's" one-way carsharing service. At present, there are eight peer-to-peer carsharing programs operating in the U.S., with three operating in the pilot phase. Finally, formal linkages between bikesharing and carsharing are planned to launch in Buffalo and San Francisco in 2012.

RECOMMENDATIONS

Pilot programs play a powerful role in demonstrating proof-of-concept and in identifying lessons learned for new approaches.

Success will rely on the integration of vehicle technologies, urban logistics, and VMT reduction. It also will require continued innovation. Public bikesharing, one-way carsharing, and peer-to-peer carsharing programs exemplify this as they extend beyond the "first- and last-mile problem" to focus on the "many mile" problem. Public policy and funding support have played a key role in making these programs possible. If innovation and new approaches are to be further pursued, public agencies should consider implementing more policies to help lower barriers to shared-use mode expansion (e.g., taxation, parking, insurance, etc.).

Finally, it is expected that the transportation system and the information system will continue to become more integrated. Policymakers should take advantage of the opportunities this shift presents to move toward a more sustainable transportation system.

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