Dynamic Ridesharing, Feeders, and the "Last Mile Problem"

Policy Note prepared by Celeste Chavis

ISSUE

Substantial reduction in transportation-related greenhouse gas (GHG) emissions cannot be achieved by cleaner vehicles alone. There must also be a reduction in the number of single-occupancy vehicle trips. This can be achieved two ways—by encouraging individuals to switch to other modes of transport, e.g., walking, bicycling, or transit, by addressing the first and last mile problem of transit, or by increasing the number of occupants in private vehicles, through ridesharing. This panel examined e-bikesharing systems, smartphone-based dynamic rideshare systems, and personal transit systems.

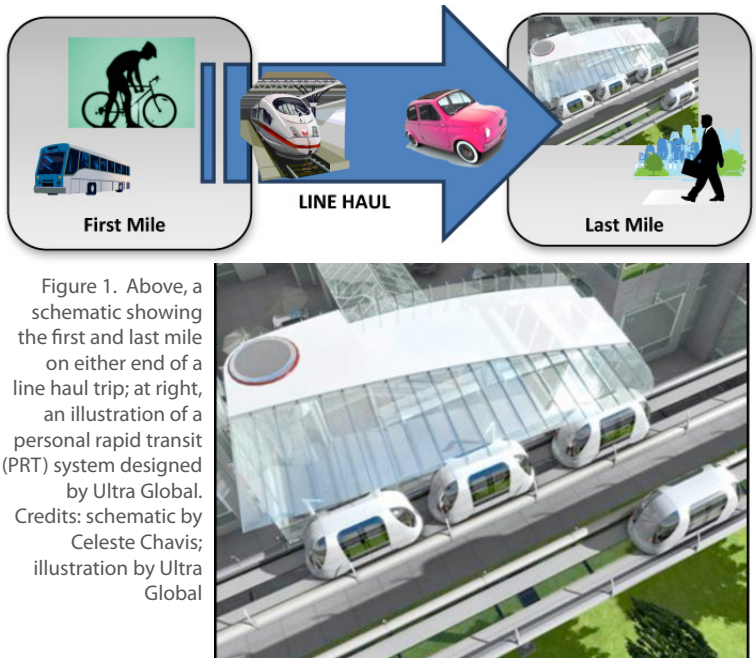

Figure 1. Above, a schematic showing the first and last mile on either end of a line haul trip; at right, an illustration of a personal rapid transit (PRT) system designed by Ultra Global. Credits: schematic by Celeste Chavis; illustration by Ultra Global

FINDINGS FROM THE PANEL

Despite the fact that over half of all trips in the U.S. are three miles or less, the vast majority are made by car. Research suggests that consumers' concerns about safety and the physical exertion involved in bicycling discourage bicycle use. E-bikes offer a potential solution to the concerns about physical exertion. Panelist Christopher Cherry, of the University of Tennessee, Knoxville, reported on an e-bikeshare pilot project that was just being started on the campus. Questions that the pilot hopes to answer are whether e-bikeshare is technically feasible, whether there is a business model that can be developed to support it, the intrinsic safety aspects of e-bike use, and how or if e-bikes displace other modes (e.g., transit as well as cars).

With GPS and smartphone technologies, dynamic ridesharing can match drivers with riders on short notice. Avego is a for-profit company that uses use social networking platforms to turn individual cars into on-demand public transit vehicles, with more flexibility than earlier web-based systems and the ability of the driver of the shared car to collect a cashless, electronic payment. The online system also allows for pre-screening of participants to reduce security concerns, explained panelist Sean O'Sullivan, of Avego.

Challenges include establishing a "critical mass" of participants, which could be addressed by analyzing transportation corridors for travel patterns and placing user groups in areas where there is sufficient supply and demand. Additionally, it requires app developers to write the app for a number of different smartphone platforms.

In September 2010 the Washington Department of Transportation awarded Avego a grant to pilot the system on the SR-520 corridor in Seattle, one of the region's most congested roadways, which was about to undergo a

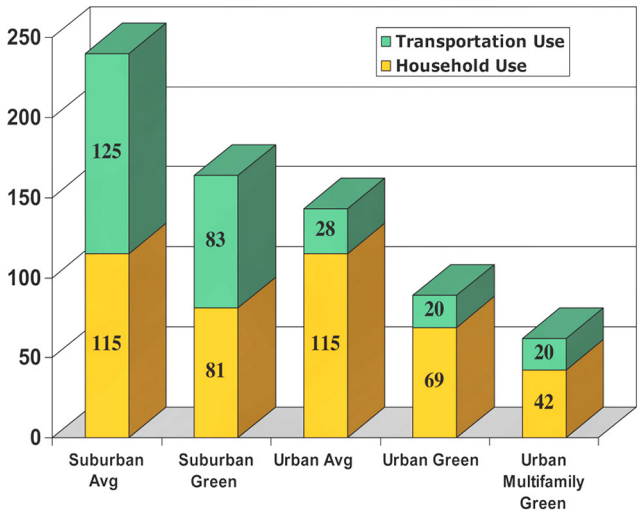

Figure 2: Transportation and household energy use shares by housing type. Figure courtesy of Steve Raney, Ultra Global

major change with the introduction of tolls on the SR-520 bridge. The service was supplemented with guaranteed ride vans, whereby travelers are able to complete their trip if they fail to find a rideshare match. It had more than 1,100 participants making more than 100 trips a day. Six more pilots with more than 70,000 potential users are planned for 2012.

Personal rapid transit (PRT) systems use small, fully automated vehicles on a fixed guideway to provide nonstop service. Initially deployed in airports, such systems are today being considered in cities to jump-start denser urban development. Urban Light Transit (ULTRA) currently operates two passenger pods, one at London Heathrow Airport. ULTRA is studying the feasibility of a PRT system at Stanford Research Park in Palo Alto, CA, which has a number of attributes that make it attractive for PRTs: 25,000 jobs are in an area that is 50 percent paved with no sidewalks; nearly half are within two miles of a Caltrain station; and 80 percent of the commute trips are made by single-occupancy vehicles. As a solution to the "last mile problem" associated with bus and heavy rail transit, a PRT system in a large suburban office park such as this could spur a new, larger-scale form of transit oriented development due to the increased accessibility afforded by these small, electric vehicles.

RECOMMENDATIONS

Public agencies may need to implement companion strategies for these new technologies; in the case of rideshare programs, they could offer guaranteed rides home. PRT systems require a very large initial capital investment in infrastructure which may not be politically feasible. With costs this significant, there needs to be a clear benefit-cost assessment. These shared transportation options may not be feasible in every setting as some are complimentary and other substitutes to one another.

PARTICIPANTS

Presenters
Sean O'Sullivan, Avego
Christopher Cherry, University of Tennessee at Knoxville
Steve Raney, Ultra Global

Moderator
Alexander Skabardonis, UC Berkeley

Discussant
Elizabeth Deakin, UC Berkeley

This is a Policy Note from the fourth panel in the third conference, "Sustainable Mobility & Cities: Marrying Technology and Policy," in the Sustainable Cities series held in 2011-2012 at UC Berkeley, organized by Berkeley Law, the College of Environmental Design, the Institute of Urban and Regional Development, the University of California Transportation Center and the Berkeley Program on Housing and Urban Policy.
The Ted and Doris Lee Fund sponsored the series.

University of California Transportation Center

BERKELEY PROGRAM ON HOUSING AND URBAN POLICY

BERKELEY IURD INSTITUTE OF URBAN AND REGIONAL DEVELOPMENT

URBAN HOUSING ECONOMY & TRANSIT CONFRONTING A CRISIS

UC BERKELEY ENVIRONMENTAL DESIGN

BerkeleyLaw UNIVERSITY OF CALIFORNIA