Shared-Use Mobility: What Does the Future Hold?

Summary of a one-day workshop held on January 11, 2015 in Washington, D.C.

Prepared by: **Susan Shaheen**, PhD

Adjunct Professor of Civil and Environmental Engineering, University of California, Berkeley

Co-Director of University of California, Berkeley's Transportation Sustainability Research Center

Matthew Christensen, MPL

Survey Researcher at University of California, Berkeley's Transportation Sustainability Research Center

WORKSHOP SUMMARY

On Sunday, January 11, 2015, Professor Susan Shaheen from the University of California, Berkeley and Jeffrey Chernick from RideAmigos led a one-day workshop on the present and future of shared-use mobility at the Transportation Research Board annual meeting in Washington, DC. The workshop featured speakers representing the various shared-use modes, other private sector representatives, and public sector officials, and many topics were discussed.

Some of the highlights included: the role of integrated mobile payment; the need to integrate shared ride services with paratransit to increase its benefits; and autonomous vehicle technologies in the future of shared-use mobility. Public-private partnerships are critical to the future of transportation, and collaboration among different groups will be key to the development of effective mobility systems.

In the opening session, *Highlights from the Innovation in Mobility Public Policy Summit (IMPPS)*, Jason Pavluchuk from Pavluchuk & Associates recapped the key points from the IMPPS that was held in June 2014 in Washington, DC. More than 250 people attended the summit, which focused primarily on federal and local policy, and industry innovation. It was noted that while innovation moves more quickly than policy, some cities are beginning to develop frameworks to better manage innovation. On a national scale, Pavluchuk described that federal policy and capital programs have not fully addressed shared-use mobility because additional research is needed to understand the impact of shared-use mobility modes, in particular on-demand ridesourcing (e.g., uberX, Lyft, Sidecar, etc.).

In the second session of the day, *Setting the Stage: What's New in Shared-Use Mobility?*, Sharon Feigon, Executive Director of the Shared-Use Mobility Center, moderated a panel consisting of Shaheen; Gabe Klein, Senior Visiting Fellow at the Urban Land Institute; and Howard Jennings, Acting Director of Mobility Lab. Feigon identified six major trends in urban mobility that are contributing to the growth of shared-use services including: 1) strategies for economic development;

2) blurring lines between paratransit and shared mobility; 3) growth in smaller cities putting pressure on public transit; 4) integration of "back-end" services through mobile apps; 5) taxi competition; and 6) the rise of shared mobility for freight and delivery. She also noted that one million trips per day are made via on-demand ridesourcing companies worldwide.

Following Feigon's opening remarks, Shaheen outlined shared-use mobility definitions and the scale of bikesharing and carsharing services, noting that bikesharing has reached almost one million bicycles worldwide, and carsharing membership has exceeded 1.5 million in the Americas. Shaheen also described some of the key findings from her recent ridesourcing study with colleagues at UC Berkeley, as well as industry developments including the launch of "ride splitting" in which multiple on-demand ridesourcing or taxi users can share the same vehicle to lower trip costs. Following Shaheen's presentation, Klein described the current state and future implications of autonomous vehicles (AVs) and other innovations and their relation to shared mobility. Klein mentioned that Google designed a vehicle to be "cute" to a wide range of people and that it is ideal for shared use. A case study of Ann Arbor, Michigan revealed that significant personal travel costs could be cut relative to private vehicle costs, if a fleet of driverless vehicles were shared among an urban population. After Klein's presentation, Howard Jennings noted that as mobility becomes more diverse and there are more options available, there is a growing need for cross-collaboration among industries and individuals, both in and outside of transportation, to help develop and maintain a "people-focus" within transportation. For proven innovative mobility services, Jennings outlined a general approach to enhance market penetration by pinpointing workforces through their employers and creating cost-effective ride share fares.

The third session, *From Dumb Wallets to Smart Cards: How Did You Pay For That?*, featured panelists Larry Yermack, Strategic Advisor for Cubic Transportation Systems; Martin Schroeder from the American Public Transportation Association; and Virginia Lingham from San Francisco's Metropolitan Transportation Commission. Lingham began the panel by describing the smartcard landscape, its architecture, and the different options that are currently being used. She noted in 2014 over 90% of public transit fare payments were made via "closed-loop" fare cards administered by the public transit agency managing the system. By

2023, it is expected that closed-loop fare cards will comprise less than 10% of public transit fare payments, and the other 90% will be split almost evenly between bankcards and mobile payment systems.

From left to right: John Gossart, RideScout; Sean O'Sullivan, Carma; Timothy Papandreou, SFMTA; Jeffrey Chernick, RideAmigos; Rick Hutchinson, City CarShare; Matt Caywood, TransitScreen

Yermack noted that the real issue we are dealing with is the "smart customer" not necessarily the smart card. To that effect, communication with the customer is important, and public transit agencies should take advantage of direct connections to their users through targeted discounts and special promotions. Yermack noted that while some smart cards can access several different public transit modes, we have yet to harness smart cards in a truly multi-modal way. He then mentioned that the smartphone will continue to grow as a payment option fueled primarily by the millennial generation. Martin Schroeder described that his role and much of what APTA is examining is related to smartphone architectures for fare systems. He mentioned that smartphones can replace ticket vending machines, reducing the need for smart cards by public transit agencies and can ultimately lower costs. Schroeder finished by saying that solutions will be multiple and variable; no one solution will meet all demand or needs within public transit nor should it.

The next session, *One Stop Shopping for Mobility*, consisted of Timothy Papandreou from the San Francisco Municipal Transportation Agency, Rick Hutchinson from City CarShare, as well as John Gossart of RideScout, Sean O'Sullivan of Carma, Chernick of RideAmigos, and Matt Caywood of TransitScreen. Papandreou opened the session by presenting a holistic view of the current urban mobility landscape and potential future trends we may see in the shared mobility space. He pointed out that while it is currently an exciting time in shared use because of the number of innovative service options available, there is little to no physical or even virtual integration among them. He outlined the general phases needed to bring about this integration, starting with a diversity of private operators and data collectors, and then moving to consolidation of these services and data.

In line with Papandreou's call for a diversification of providers and data aggregators, various companies working in this space spoke about their services. For example, Caywood explained how they collect real-time public transit information across operators and present these data in an accessible, public way. Chernick mentioned that RideAmigos combines biking, walking, public transit, and carsharing into a consolidated trip-planning platform that can be used by targeted communities for ride-matching and collaboration. O'Sullivan pointed to the need for a critical mass for carpooling services to work in a reliable way for users. Gossart presented the company's ultimate vision of true seamless connectivity between the user and the mode without even having to use a mobile device. RideScout believes that this vision is in sight now, despite the challenges that still exist. Hutchinson described his "program-oriented" approach to providing innovative means of travel to its users. These include the introduction of electric vehicles, wheelchair-accessible vans, and cargo electric bicycles.

The next session, *Fast Forward Future: Connected & Autonomous Vehicle Innovations and Their Future Impact*, was moderated by Professor Shannon McDonald from Southern Illinois University Carbondale, and panelists included Serge Matynia from Renault, Professor Dan Fagnant from the University of Utah, and Robert Sheehan from the Department of Transportation.

Sheehan from the Department of Transportation's Intelligent Transportation Systems (ITS) Joint Program office opened by explaining his organization's work in

the field of automated and connected vehicles. He stressed how the aging of the population calls for more "mobility on-demand" services. He also described how the current transportation climate of declining car ownership, rise in the sharing economy, and greater acceptance of alternative transportation modes is conducive to the creation of an automated transportation network. He went on to cite the positive impacts of connected vehicles and automation technology, such as crash avoidance, greater personal mobility, reduced congestion, and decreased energy consumption and vehicle emissions. He ended by pointing to the challenges that exist including: the transfer of control between the driver and vehicle, reliability, and cyber security concerns.

On the private sector side, Matynia from Renault emphasized the need to "keep humans in the loop." He stressed the importance of keeping in mind the people side of vehicle automation by leveraging human factor experience, as well as building trust in individuals' minds with this technology. Fagnant provided an academic research perspective by describing his ongoing work in modeling shared autonomous vehicle systems using case studies and simulation software. He found that the system would be potentially profitable, if the cost of the autonomous vehicle comes down to US$70,000. With respect to the operational side of an actual shared "on-demand" autonomous vehicle network, concerns were raised about both geographic and income equity, social dynamics of people sharing a vehicle with no driver, and the possibility of induced trips and higher vehicle miles/kilometers traveled. The panel generally responded to these concerns by stating that more research is needed on all of these issues.

The day ended with a final wrap-up discussion led by Shaheen and Chernick. Among all of the highlights outlined above, several critical points were emphasized including the need for more academic research and cross-sector communication. Panelists and attendees mentioned that shared-use transportation modes need to be at the center of transportation research to quantify and understand the impact of such modes. Furthermore, it was noted that enhanced communication among public and private sector transportation providers, and intra-communication within those sectors, will be necessary to increase accessibility, safety, and efficiency of our overall transportation networks.

WORKSHOP PRESENTATIONS:

To view and download some of the presentations from the workshop, go to innovativemobility.org/?project=shared-use-mobility-what-does-the-future-hold-workshop-synopsis.

SPEAKERS:

Susan Shaheen, Transportation Sustainability Research Center, UC Berkeley; **Jeffrey Chernick**, RideAmigos; **Jason Pavluchuck**, Pavluchuk & Associates; **Sharon Feigon**, Shared-Use Mobility Center; **Gabe Klein**, Urban Land Institute; **Howard Jennings**, Mobility Lab; **Jeffrey Spencer**, U.S. Federal Transit Administration; **Larry Yermack**, Cubic Transportation Systems; **Martin Schroeder**, American Public Transportation Association; **Virginia Lingham**, San Francisco MTC; **Timothy Papandreou**, SFMTA; **John Gossart**, RideScout; **Sean O'Sullivan**, Carma; **Rick Hutchinson**, City CarShare; **Matt Caywood**, Transit Screen; **Shannon McDonald**, Southern Illinois University Carbondale; **Serge Matynia**, Renault; **Dan Fagnant**, University of Utah