MULTI-MOBILITY & SHARING ECONOMY:
Shaping the Future Market Through Policy and Research

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Executive Summary

Multi-modal mobility is the use of a combination of different modes to get from one place to another. Multi-modal mobility is growing in popularity, especially in urban centers with recurring problems associated with congestion, parking, and an overall lack of space. The shift from homogeneous to multimodal mobility has resulted in some shifts in the transportation sector, including land use and planning. Technology is moving at a tremendous pace, which has resulted in the evolution of modes like carsharing, carpooling, ridesharing, ridesourcing, bikesharing, and others, as well as improvements in existing public transit options. This has added a multitude of innovative mobility options for riders, many of which were not available until recently. The sharing economy includes both business-to-consumer and peer-to-peer models of sharing of goods and services, which has seen tremendous growth in the past decade. Many transportation startups, like Lyft and Uber, which allow drivers to source rides to passengers using a platform to make money, leverage on the concept of a sharing economy. Companies that are a part of the sharing economy have gained notable momentum in the last five years, giving rise to a multitude of service-based startups.

On January 10, 2016, Professor Susan Shaheen of UC Berkeley's Transportation Sustainability Research Center (TSRC) and Prachi Vakharia of Ride Amigos hosted the "Multi-Modal Mobility and Sharing Economy: Shaping The Future Market Through Policy & Research" workshop at the Walter E. Washington Convention Center in Washington DC. It was organized as part of the Transportation Research Board (TRB) 95th Annual Meeting. The workshop was sponsored by the following subcommittees:

- Emerging and Innovative Public Transport and Technologies Committee (AP020)
- Shared-Use Mobility and Public Transit Subcommittee (AP020(1))
- Emerging Ridesharing Solutions Joint Subcommittee (AP020(2))
- Automated Transit Systems (AP040).

The workshop facilitated a dialogue among nearly 120 participants from public sector organizations, private companies, non-profit research groups, and educational institutions. It included a healthy exchange of ideas between veterans in the field with years of experience behind them and new attendees either curious or aware of the latest technological advances in the field. The workshop discussed new developments in the shared mobility sphere, explored the use of smartphones in pushing the goal of shared mobility forward, and elaborated on rural and suburban mobility problems. It also raised the issue of equity when it comes to paratransit options in relation to innovative transportation modes and touched on strategies that could foster an environment of increased inclusion. Automated vehicles were also considered during the workshop, regarding their benefits and challenges for policymakers in ensuring that their safety standards match existing ones.

Four key goals of the workshop included:

- Evaluating the impacts of technology on shared mobility,
- Initiating a dialogue between public organizations and private companies, especially regarding data sharing practices,
- Evaluating the reach of shared mobility beyond dense urban centers, and
- Discussing current research and policy regarding evolving technology.

A combination of plenary and breakout sessions covered many issues regarding multi-modal mobility and the sharing economy. The three panel sessions discussed the latest developments and understanding in shared mobility, smartphone apps, and paratransit/rural and suburban applications. Dignitaries and industry stalwarts spoke at length about the way smartphones are disrupting transportation services available to users. At the same time, they also discussed inclusiveness and how to make innovative services accessible to people without a smartphone or with a disability that hinders their ability to access technology. Several comments were made regarding automated vehicles and how they can be integrated into the roadways in a gradual way. The breakout sessions focused on the topics of planning and modeling and the integration of innovative services with public transit apps. Many supported that public transit should be integrated with ridesourcing and carpooling modes to provide a multi-modal transport experience to travelers.

This synopsis covers findings and discussions from the conference, and it summarizes the key topics explored throughout the day. The report starts off with introductions from Susan Shaheen of UC Berkeley and Prachi Vakharia of RideAmigos. Next, the three expert panel sessions are discussed, touching upon key points made by each panel member and moderator. Next, the four interactive breakout sessions are covered, providing a synopsis by the moderators. Finally, a conclusion summarizes the overall findings and key takeaways from the workshop.

Panel Sessions

Session 1: Workshop Overview and Participant Introductions

The workshop started with an overview by Susan Shaheen of TSRC, UC Berkeley and Prachi Vakharia of RideAmigos. Professor Shaheen set the stage for the day by presenting an overview of shared mobility trends and developments over the past year, as well as the agenda.

Session 2: Setting the Stage: What's New in Shared Mobility?

The first panel session of the morning, moderated by Timothy Papandreou of the San Francisco Municipal Transportation Agency (SFMTA), consisted of five expert panelists: Susan Shaheen of TSRC, UC Berkeley; Gabe Klein of Fontinalis Partners, Sarah Hunter of GoogleX, Katherine Kortum of TRB, and Dana Lipp of ShipBird. Mr. Papandreou opened the session with a presentation about mobility trends, focusing attention on developments in the city of San

Francisco. He noted the inefficient nature of vehicles that sit stationary 95 percent of the time, as well as the peaking nature of public transit that is at 120 percent capacity during peaks, but it is 80 percent empty off-peak. He spoke about a multitude of mobility options in San Francisco that are growing rapidly and are increasingly tailored to the individual and trip type. Explaining the shift of transportation norms from a 'binary system' to 'mobility as a service,' he talked about traditional, trending, and near-future transportation habits: traditional are the ones where we our own transportation or use public transit. Trending is when we own our transportation and/or access shared mobility options. In the future, Mr. Papandreou predicted, there will be a menu with mobility options open for riders to choose from, using their smartphone. He also mentioned that transportation and land-use planning need to be integrated across the state, regional, and local levels. Mr. Papandreou then shifted attention to various transportation modal choices in urban centers, predicting that 50 percent of the modal share in San Francisco will be by sustainable modes by 2018. He also spoke about scheduled mobility and mobility on demand. He mentioned SFMTA's vision for mixed-use land use planning, travel demand management, and parking and traffic management. Some of the immediate plans for SFMTA include walkable streets and spaces, local and regional public transit networks, bicycle network and facilities, and vehicle sharing and shuttle partners. He discussed the need for a city transportation platform that is inclusive of customers and mobility providers, which integrates technology and street space. The importance of using data to shape new policies was stressed on multiple occasions. He also provided some data from surveys administered by the SFMTA. Some interesting results were: At least 20 percent San Franciscans use taxis, 25 percent use ridesourcing (e.g., Lyft, Uber), six percent use carsharing, and four percent have tried Bay Area Bike Share at least once per month. A plan to create an integrated customer experience was also discussed, which allows users to see routing choices, mode choice options, booking, payments and credit options. This common transportation platform will need both physical and virtual integration including standards, policies, and guides that enable more flexibility and customer focus.

The panel discussions focused around what major trends will impact the overall transportation system, what challenges exist in the space including technological, policy, and equity barriers. After Mr. Papandreou's presentation, he opened up the discussion and invited each panelist to introduce themselves.

Professor Susan Shaheen of TSRC, UC Berkeley provided an ecosystem overview, touching upon many different shared mobility modes and how they fit into the mobility picture, as well as new developments over the last year. She spoke about carsharing trends and how both the number of members and number of vehicles have grown exponentially since 2006. She noted that the number of vehicles have grown almost tenfold from 11,501 in 2006 to 104,125 in 2014; at the same time the number of members has also risen from 346,610 in 2006 to 4,842,616 in 2014. She also provided the continent-specific numbers for both one-way and roundtrip carsharing memberships. After discussing carsharing highlights for 2015-16, she focused on bikesharing and how it has grown in the U.S. and globally. She introduced cutting edge developments in the sphere of bikesharing, like free-floating bikesharing (SoBi), P2P bikesharing (Spinlister), e-bikesharing, and keyless bike locks.

Moving on, she provided recent data on the ridesourcing and e-Hail market trends for 2015-16. She presented the approximate fleet size and developments for Lyft, Uber, Easy Taxi, Curb, mytaxi, and Flywheel. New developments in these companies include the continued expansion of ridesplitting in the form of Lyft Line and uberPOOL, GM's $500M investment in Lyft, and the opportunity to link automated and connected vehicle technologies with ridesourcing. Further, Professor Shaheen noted how the traditional taxi companies are trying to adapt to the changing transportation landscape. Some examples of this include San Francisco's oldest taxi firm, DeSoto, rebranded itself as FlyWheel and received approval for a smartphone taxi meter (TaxiOS) from the California Division of Measurement Standards; NYC launched the Arro taxi app; the taxi sharing app "Bandwagon" expanded to LaGuardia and JFK airports, and the "Ride" app launched in 35 Canadian cities. She wrapped up with TSRC research highlights for 2015 and plans for 2016.

Professor Shaheen also emphasized the importance of the smartphone in making a lot of these mobility services more popular, but at the same time mentioned how notable built environment factors are as well. There are also equity issues to consider in the growth and expansion of shared-mobility services, for instance, the divide between those who own smartphones and those who do not own one. This can prevent some people from accessing certain services. A government role, as well as research involvement, can help to foster a more inclusive environment for all travelers. In terms of expanding these services to a larger audience, she talked about how role models and targeted marketing are important to including more groups.

Katherine Kortum of TRB opened by discussing a recently released TRB Special Report 319. The report made specific recommendations to cities and municipalities regarding what to think about when constructing regulations around some emerging shared mobility options. Some specifications made in the report included: 1) examining the growth and diversification of technology-enabled mobility services; 2) exploring the implications of these services on consumers and existing transportation services; 3) identifying policy, regulatory, and other issues and opportunities to plan for and regulate these services; and 4) identifying priority areas of research to inform public policy decisions. Several recommendations for public policies to be designed to steer the development of innovative services were also discussed briefly. Ms. Kortum went on to discuss ACRP Report 146, which was released in December 2015; it reviews the ground transportation industry and discusses potential solutions to challenges that airport operators face frequently. It also provides guidance on selecting and implementing these solutions. Finally, she talked about the TCRP J-11, Task 21: the impacts of new technology-enabled mobility services on public transportation. She concluded her presentation, pointing toward other upcoming studies from TRB and upcoming roundtable discussions.

Dana Lipp of ShipBird explained her company and how they operate, noting that ShipBird is a courier network service that uses pre-determined scheduling so it is not exactly on-demand like a ridesourcing service. At present, they have 3,400 drivers in the Bay Area, and you can schedule from up to a month or a day in advance. She stressed that they value the human component in their company as much as the technology. Ms. Lipp mentioned how ShipBird can take some of the strain off traditional delivery services operating in the market. With major online retailers

like Amazon, the number of packages shipped is increasing, creating a larger market for all delivery companies involved.

Sarah Hunter from GoogleX spoke about the self-driving car project, and how they are focused on developing a fully automated vehicle instead of slowly rolling out features like the major automakers are already doing. She also raised concern that the regulations around ridesourcing are not clear yet–things like how much you can legally charge to carpool, labor laws of part-time contractors, and what percentage of the fare should go to the driver. She talked about a clearer plan if self-driving cars are to be used as a ridesplitting mode. Ms. Hunter discussed how technology is moving at a rapid pace, but policy changes are not moving at a comparable speed. While speaking about the equity piece of self-driving cars, she explained how the older demographic are some of their biggest supporters, concluding that sometimes the less obvious demographic groups are the ones most excited about a new technology.

Gabe Klein of Fontinalis partners explained their vision as a venture capital firm that invests in mainly mobility companies. He explained why the transportation space right now is so exciting and how the relationship of more traditional car companies with their customers is constantly evolving. He stated that the analog age of cars is over, and we have already transitioned into the digital age. It is not clear car companies yet understand the needs and wants of the urban public and how transportation is becoming more and more service-based. However, who controls the transaction in a service-based mobility ecosystem will be a very important factor. He opined that the service-based model would not work well, however, if the public and private sectors do not cooperate. He noted a major shift that will need to happen is from the sharing economy to the collaborative commons. He also noted an event like displacing 14 million drivers will require large policy shifts. On a positive note, he exclaimed how far we have come in terms of public discussions with respect to radical policy changes. He contrasted the difference today in terms of current discussions in public forums, with the time when many streetcar systems were dismantled in American cities in the 1950s. Streetcar elimination was not an open dialogue, but today we have more of an open dialogue between the public and private sectors, and this will definitely help steer the change.

Session 3: Smartphone Apps

In the second session, experts in this panel spoke about smartphone applications and how they are changing the landscape and behavior of users around mobility modes and choices. Many issues were covered, such as data sharing and privacy, the need for real-time information, the impacts on urban form, success stories, payment integration issues, as well as others.

Moderator Allen Greenberg of the Federal Highway Administration (FHA) opened by speaking about pay-as-you-drive insurance and more vehicle miles traveled (or VMT)-based approaches to charging road users and how smartphones could help with this approach. He mentioned that 90 percent of drivers believe they are "better than average" drivers, which simply cannot be true. A solution for this misplaced perception of people could come from robust data. If users had a way to see data on their own and others' driving, they might think differently about how good of

a driver they are. Mr. Greenberg also mentioned that casual carpooling can be an effective demand management tool and is a behavioral piece that has existed for a while. Yet the issue of how a user gets to a meeting point is still a tricky issue at times. Some of these innovative mobility services might be able to aid with the connection to casual carpooling.

Tim Papandreou of the SFMTA spoke about how important real-time information is in these new transportation services, especially regarding ridesourcing services. He emphasized the need for agencies like his to become more of a technology platform than they have been in the past. Real-time information is of paramount importance, and we need to have livability, accessibility, equity, and sustainability as core goals. Mr. Papandreou also touched upon the issue of connectivity and the need for public transit agencies to provide reliable mobile phone connection or WiFi to be able to compete with these more tech-enabled services. He also covered the data sharing issue and noted that even different public agencies sharing data with each other is hard, let alone public and private sharing with each other. He opined that this needs to change, but at present there are not strong enough incentives for a collaboration like this. A data sharing standard could be implemented, but we are still in a 20th century military-style paradigm. He also spoke about the need to reform antiquated and unnecessarily long planning processes. He contrasted how Bridj and other microtransit services can change a route in a day, while a governmental agency requires a nine-month planning process to change a single bus stop. He explained why transportation should serve land use and not the other way around. He spoke at length about how key performance indicators (KPI's), annual metrics, and daily metrics will be revolutionary in measuring the success of a public transit operator. He encouraged Federal agencies to take steps to start developing these key metrics, as well.

Martin Schroeder of American Public Transportation Association (APTA) spoke about the importance of public transportation as a "backbone" service in cities and how they need to get better at partnering strategically with some of these emerging mobility services. He believes this kind of a partnership could open more markets of public transit riders. He then discussed the importance of planning for events and demand management and how technology could be a huge help in this area. He mentioned that we have not seen a colossal shift in public transit usage overall in the last decade, and he discussed the increasingly intense battle for who owns the customer. If public transit is the backbone, they own the customer. However, as long as the customer has a plethora of mobility options, public transit will be a success.

Dr. Regina Clewlow of Ride Scout spoke about her company's app and how it aggregates all mobility modes like public transit, biking, taxis, carsharing, ridesharing, parking, and walking directions in real time to allow the user to make the best mobility decision for their personal needs. She also talked about the impressive achievement of Ride Scout in winning the 'Just Transit SF' award. In terms of how these services will affect urban form, she opined that it is a two-way street. Apps and services will affect where people live and in turn what modes they use, resulting in a continual feedback loop. She talked about how inclusion of automated vehicles will open up new challenges and make it harder to plan. Talking about the future goals of Ride Scout, Dr. Clewlow acknowledged the importance of a payment integration system within the app, mentioning success stories of European operators, like Moovel and Ubigo, in this regard.

Michael Weaver of RideAmigos explained what his company does as a transportation demand management resource. Their goal is to help people "commute better." He also acknowledged the importance of the smartphone as a tool in encouraging behavioral change.

Pete Gould of Uber reiterated the disruptive pace of technology by pointing out that Uber, as well as many innovative services, did not exist even five years ago. There has been an amazing amount of change in the transportation sector in a very short period of time. He further went on to comment that Uber is just one piece of the overall mobility revolution. The real competitor for them and everyone else is single occupancy vehicles (SOVs). He explained how they approach starting their business in a new city, which is to start the service initially at the city center and then slowly spread outward from there. He discussed how uberPOOL is attacking the SOV problem in the center city, as well as less dense areas, and why they are really excited about their service. He mentioned that Uber is more concerned about drawing from the SOV pool (84 percent of commute trips are SOV in U.S.) instead of drawing from the smaller pool of taxi trips. Mr. Gould also noted that comfort levels with sharing a ride are changing rapidly. This goes on to show that the user does not really care how they get from A to B as long as it is comfortable and matches their time-cost expectations. If someone moves to a city and never gets a car because they can rely on these services, it is a success for not just Uber but all shared mobility systems. He revealed some partnerships that Uber has made recently with public transit agencies, like DART in Dallas and MARTA in Atlanta. While talking about the importance of data, he mentioned which metrics matter the most for Uber including wait time, rating, trip time, and the real-time nature of all incoming data.

Audience Feedback

Professor Shaheen wrapped up with an overview of part one and noted the emphasis in the morning discussion was on the customer and how mobility options are focusing more on customer service, which was not been as notable a consideration in the past. She also emphasized that immediate feedback and real-time data are big factors. Rating systems are bringing about a new level of trust and confidence among people who were not used to sharing a ride before. She mentioned how there still remains huge challenges in the suburban and rural landscapes, these issues would be discussed in the next session.

Session 4: Paratransit/Rural and Suburban Applications

In the third panel, experts spoke about issues around innovative mobility services in the context of less dense suburban and rural settings, and they explored how these modes might best proliferate and serve these areas. Many issues were covered including: 1) the role of public transit in helping introduce suburban areas to mobility services, 2) integration of different mobility options that allow suburban people to reach their destination hassle free, and 3) the need for paratransit options in emerging transportation modes, with a special emphasis on blind, disabled, and older adults.

Moderator Stephen Zoepf of MIT opened by noting the importance of including everyone, even those in suburban and rural contexts, with innovative mobility services.

Art Guzzetti of the American Public Transit Association (APTA) started his remarks by noting that understanding of these systems is still limited and mostly anecdotal. He provided a list of key points for these services to proliferate in a less dense setting. For instance, ridesourcing has to start in the strongest markets and then spread from there. The services should follow where the people are, and public transit should serve as an important backbone. At the end of the day, he concluded that public transit will still need to be the core transportation background of a city and will likely need to be stronger than it is at present with the expansion of shared mobility services.

Emily Castor of Lyft noted the maturation of the discussion around these services even since TRB last year. She commented that we have had a two-mode market (public transit and cars) for too long, but the lines are beginning to blur. Land-use realities are the reason people choose to drive alone, and we will need an "accordion" of services to help tackle this issue. People will need to give up car ownership and become "omnivores" of a variety of mobility services that work for their individual travel needs. Ms. Castor also noted how blind and low-vision communities have profited from their services at Lyft. She raised the importance of serving a particular place for its needs and context. For example, a five-minute waiting time for a Lyft is too long in the urban core, whereas a 15-minute wait time might be acceptable in the suburbs.

Jennifer O'Brien of Hopista commented on her experiences with ridesharing in a rural and suburban context, and she explained how she started hitchhiking with whiteboards to tell drivers where possible riders were headed. Carma Carpooling agreed to support her initiative and built her a map to record GPS locations, although hailing a ride from the road via the whiteboard was still an option. In a study conducted in the Lawrence, Kansas area, Ms. O'Brien and her colleagues logged 300 total rides with an average wait time of seven minutes. One out of every 16 cars stopped, and there was no monetary reward involved for drivers. She said that her key takeaway was that human kindness is a better motivator than we might think. At the same time, we have to make it easy and streamline it for riders and drivers to see success. She mentioned that an important metric to measure success is accessibility to jobs (e.g., only 9 to 12 percent of jobs in Lawrence, KS are accessible by public transit). Publicly sponsored or collectively managed carpooling could help fill this gap. She also note the difficulties of scaling a service without economic motivations, mentioning the example of Couchsurfing being overtaken by AirBnB and Zimride transforming into Lyft.

Kim Charlson of the American Council of the Blind provided a first-person insight into the difficulties of paratransit services from the user's perspective. She noted that transportation is a big advocacy issue for the blind community. She relayed the desire of the community to have more service options. Ms. Charlson noted that most members of the blind community take what they can get, at present, which is not always that great. She commented that technology can be a good enabler, and ridesourcing has improved accessibility to some extent. At the same time, she agreed that technology can sometimes be a challenge for the blind. Voice-instruction technology must be there, and location information must be accurate as well. Another challenge of blind

ridesourcing users is that some drivers do not allow seeing eye dogs inside their vehicles. She mentioned "The Ride," a paratransit program supported by the MBTA in Boston that accepts pre-paid Visa cards as payment and serves short-distance shared paratransit rides. She also noted that her organization is looking into working with ridesourcing services in the future. Her goal is a non-eventful ride that goes smoothly and allows blind individuals to live a more spontaneous life.

Jeff Maltz of SilverRide gave his perspective of operating a ride service for disabled and older customers. He explained why the person who is conducting the ride is very important and mentioned that they focus on good customer service. He noted that studies show that if an older individual stop driving, it reduces their level of activity by 70 percent, which in turn increases their chance of death by 40 percent. He mentioned their efforts of piloting a ridesharing platform in the Bay Area. He reiterated that although technology is key, there must be a personal touch, pointing out that 15 percent of Americans older than 65 do not own a smartphone. He noted the importance of focusing on the user, especially users that could not be retained. Traditional paratransit services do not focus on why a user stopped using their service.

Interactive Breakouts

After the third panel, all workshop attendees formed four breakout sessions where they discussed the topics from the workshop. The breakouts were divided into four topic areas: 1) automated vehicles, 2) paratransit and rural/suburban applications, 3) planning/modeling approaches, and 4) integration with public transit/apps. After a healthy exchange of ideas in the breakout sessions, the moderators of each breakout reported back the major ideas that came out of their respective discussions:

1. *Automated Vehicles:* The first breakout session, on automated vehicles, was moderated by Bob Sheehan of the ITS Joint Programs Office and Matt Lesh of Noblis. Interesting discussions ensued as to how the technology of automated vehicles cannot survive without proper wisdom surrounding its execution. It was agreed by the group that automated vehicles can be a boon to ridesharing and freight services because it will substantially reduce labor costs. Another important utility of automated vehicles is that it can provide the first/last mile connection to public transit stations, but at the same time this places automated vehicles directly in competition with other modes, like bikesharing. The final piece discussed in the breakout session was the problem of accessibility: How inclusive will automated vehicles be regarding disabled people?

2. *Paratransit, Rural, and Suburban Applications:* The second breakout session was moderated by Deron Lovaas of the Natural Resources Defense Council and Autumn Bernstein of UC Davis. This breakout session focused on data collection from rural and suburban areas. At present, much of the focus of shared mobility is concentrated on tech savvy young urban professionals. Technology is moving at such a rapid pace that the traditional methods of collecting data are unable to keep up. It was discussed how important it is to also focus on how we are affecting the health and quality of life of

users. There needs to be a collaboration among governmental agencies and ridesourcing companies to share data in a way that is beneficial to both parties.

3. ***Planning/Modeling:*** The third breakout session was moderated by Clint Daniels of San Diego Association of Governments and Jeffrey Spencer of the Federal Transit Administration. In this breakout session, the role of agencies in sharing planning drafts with each other was discussed, so that work is not repeated. Finding out whether or not ridesourcing modes are in competition or a complement to public transit in a quantifiable manner is also a major challenge for agencies. In planning, the focus should not only be on the data fields but the whole story and how it can benefit us overall. While modeling the demand for transportation systems, careful distinction should be made between vehicle demand and personal utility demand. Questions were raised as to whether or not ridesourcing services are reducing VMT. When public agencies plan and model for land use, it was agreed that they should recognize shared mobility as a mode in those travel models.

4. ***Integration with Public Transit/Apps:*** The final interactive breakout session of the afternoon was moderated by Steve Raney, Cities21 and Alan Woodland of the CarSharing Association. Members of this breakout group discussed the role of research specific to the topic of public transit. Interesting concerns were raised regarding regulatory and procurement obstacles when conducting research. This group also discussed the role of mobility aggregators in integrating public transit trips with ridesourcing, which can solve the first mile/last mile problem faced by travelers. The session ended with a strong acknowledgement of the environmental benefits of public transit over driving alone and the need for new policies that focus on increasing occupancy to reduce congestion and protect the climate.

Conclusion

Multi-modal mobility is gaining momentum rapidly in most urban centers, and is gradually finding its way to suburban locations. Travelers are increasingly placing value on convenience and time over the need for ownership. Technological advancement in the past decade has helped propel a host of innovative transport modes that include carpooling, ridesharing, bikesharing, and ridesourcing. Public transit agencies are also acknowledging the need to modernize their platforms with smartphone apps and sharing data through trip planning platforms.

The workshop focused on many of these new developments in the realm of multi-modal mobility and also touched upon the emergence of the sharing economy around certain emerging modes. The panel sessions provided nuanced insight into developments in the field, drawing comments from experts from public agencies, academia, private companies, and technology enthusiasts. The role of shared mobility and smartphones and apps was discussed in detail and how such innovations have caused shifts in the way people travel and make trips on a daily basis. The need for equity and not leaving anyone behind was highlighted throughout the panel sessions. It is

important to be as inclusive as possible, especially to individuals from all socio-economic backgrounds and people with disabilities.

The interactive breakout sessions provided an opportunity for the audience to get directly involved with the speakers after listening to the three panel sessions. A healthy discussion ensued around automated vehicles and the need for policymakers to have a pragmatic view on them (recognizing their potential benefits and costs). There also were detailed discussions on new planning and modeling methods that have emerged as people have expanded their travel modes from unimodal or bimodal to multimodal. Many pressing concerns were raised about how innovative modes fit into the overall transportation picture, which could be better answered with robust quantifiable models. Overall, the workshop initiated a much-needed dialogue among experts and practitioners from diverse backgrounds and informed the audience about developments, challenges, and the road ahead for multi-modal mobility and the sharing economy.

Agenda

Multi-Modal Mobility & Sharing Economy: Shaping The Future Market Through Policy & Research
Sunday, January 10, 2016, 9:00 a.m.- 4:30 p.m., Walter E. Washington Convention Center
Susan Shaheen, Transportation Sustainability Research Center, UC Berkeley and Prachi Vakharia, RideAmigos presiding
Sponsored by Emerging and Innovative Public Transport and Technologies Committee (AP020); Shared-Use Mobility and Public Transit Subcommittee (AP020(1)); Emerging Ridesharing Solutions Joint Subcommittee (AP020(2)); Automated Transit Systems (AP040)

TRB 2016 Spotlight Theme: Research Convergence for a Multi-Modal Future

This one-day workshop features speakers from the shared mobility sector. Industry, government, and academic thought leaders will present and participate in panel discussions with the audience about the latest developments/understanding in shared-use mobility, smartphone apps, automated vehicles, and paratransit/rural and suburban applications—emphasizing multi-modal connections. At the end of the workshop, we will have an interactive workshop with breakout sessions and report back on next steps and role of future research.

Session 1: 9:00am to 9:30am
Workshop Overview & Participant Introductions

Presenters:
Susan Shaheen, TSRC, UC Berkeley and Prachi Vakharia, RideAmigos

Session 2: 9:30am to 10:30am
Setting the Stage: What's New in Shared Mobility?

Moderator: Timothy Papandreou, SFMTA
Panelists:
Susan Shaheen, Co-Director, Transportation Sustainability Research Center, University of California, Berkeley
Gabe Klein, Senior Visiting Fellow, Urban Land Institute
Sarah Hunter, GoogleX
Katherine Kortum, Transportation Research Board
Dana Lipp, ShipBird

<div align="center">BREAK: 10:30AM TO 10:45AM</div>

Session 3: 10:45am to 11:45am
Smart Phone Apps

Moderator: Allen Greenberg, FHWA
Panelists:
Regina Clewlow, Ride Scout

Pete Gould, Uber
Martin Schroeder, American Public Transportation Association, Chief Technology Office
Timothy Papandreou, SFMTA
Michael Weaver, RideAmigos

Audience Feedback: 11:45am to Noon
Moderators: Susan Shaheen, TSRC, UC Berkeley and Prachi Vakharia, RideAmigos

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LUNCH BREAK: 12:00PM TO 1:30PM

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Session 4: 1:30pm to 2:30pm
Paratransit/Rural & Suburban Applications

Moderator: Stephen Zoepf, MIT
Panelists:
Emily Castor, Transportation Policy Director, Lyft
Jennifer O'Brien, Hopista, Founder
Jeff Maltz, SilverRide, Founder/CEO
Kim Charleson, American Council of the Blind
Art Guzietti, American Public Transportation Association

Interactive Breakouts: 2:30pm to 3:30pm

Moderator, Automated Vehicles: Matt Lesh, Noblis and Bob Sheehan, ITS Joint Programs Office
Moderator, Paratransit & Rural/Suburban Applications: Autumn Bernstein, UC Davis and Deron Lovass, NRDC
Moderator, Planning/Modeling: Clint Daniels, SANDAG and Jeff Spencer, FTA
Moderator, Integration with Public Transit/Apps: Steve Raney, Transportation Consultant and Matt George, Bridj

BREAK: 3:30PM TO 3:40PM

Moderators Report Back: 3:40pm to 4:20pm

Final Wrap Up: 4:20pm to 4:30pm
Presenters:
Susan Shaheen and Prachi Vakharia