TRIENNIAL STRATEGIC PLAN AP020

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COMMITTEE FUTURE OUTLOOK STATEMENT

The Emerging and Innovative Public Transportation Technologies Committee (AP020) considers new, emerging and innovative concepts, systems, and technologies that facilitate mobility. Emerging and innovative forms of mobility include various types of services such as public and private transportation solutions, on-demand mobility, and shared modes including:

- Carsharing
- Micromobility [bikesharing and scooter sharing]
- Microtransit
- Ridesharing [carpooling/vanpooling]
- For-Hire Services [ridesourcing/taxis]
- Courier Network Services (CNS), robotic delivery, other last mile delivery innovations
- Mobility on Demand (MOD)
- Mobility as a Service (MaaS)
- Shared Automated Vehicle (SAVs)
- Other innovative and emerging technologies

Additionally, the concepts and technologies include enablers that facilitate operations and customer access to these services, such as on-board and customer hardware and software, information systems, applications (e.g., smartphone or mobile applications that provide real-time information or allow customers to use shared mobility), fare payment, and communication technologies. The committee also covers the impact of these services and technologies on travelers, communities, and society.

The scope of AP020 includes a variety of passenger and goods delivery modes that are shared including: 1) sequential sharing (i.e., different users sharing the same transportation vehicle or equipment, one after the other) and 2) concurrent sharing (i.e., sharing of the same transportation vehicle or equipment by multiple non-household users for the same trip).

In recent years, shared passenger and courier services have grown rapidly due to advancements in technology; changing consumer patterns (both mobility and retail consumption); and a combination of economic, environmental, and social forces. Technology, mobility, and goods access is changing at a faster pace than ever before. AP020 fosters research that seeks to understand and leverage these innovations to support environmentally sustainable, equitable, traveler-centric, connected, integrated, and multimodal transportation systems. Our committee aims to further the understanding of these new and emerging technologies, while providing a platform for key industry, government, academic, nonprofit, and individual contributors to help contribute to research and shape the industry as it seeks to expand transportation access and mobility for all.

COMMITTEE PLAN

Cross-Cutting Issues, AP020 Focus Areas, and Research Emphasis
The committee's activities continue to help address critical and cross-cutting issues identified by the TRB Executive Committee, the Technical Activities Council, and the Group/Section that fall under the scope of the committee. AP020's committee focus supports these goals in the following ways:

- **Transformational Technologies and Services**: In recent years, advancements in social networking, location-based services, wireless networks, and cloud technologies are contributing to the growth of shared mobility, Mobility on Demand (MOD) and Mobility as a Service (MaaS). MOD is an innovative transportation concept where consumers can access mobility, goods, and services on demand by dispatching or using shared mobility, courier services, unmanned aerial vehicles (UAVs), and public transportation solutions. MaaS emphasizes mobility aggregation, smartphone and app-based pay-as-you-go and subscription access, and multimodal integration (infrastructure, information, and payment integration). AP020 provides leadership in promoting and conducting research and policy, and promoting knowledge transfer on MOD/MaaS-related issues to industry, decision makers, and others who are responsible for multimodal transportation systems.
- **Serving a Growing and Shifting Population**: Demographic changes are impacting traveler behavior: The first population cohort is of millennials, centennials, etc. who are not personally owning vehicles and are more apt to use an alternate to self-driving. The second cohort is the aging population, with rising life expectancies, and retiring in place, whose need for accessible means of transportation has to be addressed. Shared modes may be an effective option to offer older adults curb-to-curb transportation options to help overcome physical and cognitive limitations that make using traditional modes of transportation challenging. As such, AP020 supports research needed to enhance mobility and accessibility for countries with rapidly changing needs.
- **Energy and Sustainability**: An increasing body of empirical evidence indicates that shared modes have numerous environmental and energy impacts. While impact studies on carsharing and public bikesharing are fairly extensive, the impacts of newer service models and emerging modes, such as scooter sharing and courier services are less studied and understood. Additionally, there is uncertainty associated with automated vehicle impacts on energy and the environment as automated vehicles could result in notable growth beyond cities into suburban and rural locations. AP020 seeks to enhance the understanding of these impacts for existing and emerging service models. Unstudied modes and various results from studied modes have raised questions about the impacts of these services and how to develop policy when the impacts can vary considerably.
- **Resilience and Security**: AP020 recognizes that innovative and emerging transportation technologies, such as shared mobility and shared automated vehicles can have a notable impact on resilience, security, and emergency response. AP020 seeks to enhance preparedness and collective understanding of the physical and cyber security vulnerabilities associated with shared modes, both today and in a future that includes automated vehicles.
- **Safety and Public Health**: The recent growth of active transportation and shared micromobility has the potential to support positive health outcomes. AP020 supports efforts

to understand the health impacts of these services and safety enhancements needed to support a vision zero goal for micromobility.

- **Equity**: Despite potentially providing disadvantaged communities with additional service offerings, shared modes have failed to gain traction among these groups, with many surveys showing user bases that under-represent low-income and non-white users. The lower rates of usage among the poor have many plausible explanations including lack of availability in low-income neighborhoods and limited Internet, lack of smartphone, credit/debit card access, and cost of services. There is also a need to provide access to those less familiar with smartphones technology (e.g., older adults), as well as people with disabilities. Some of these populations could benefit a great deal from on-demand mobility. AP020 supports research that fills gaps in knowledge about users and non-users, and existing policy barriers to piloting and implementing equitable services for all users.
- **Governance**: AP020 works to promote collaboration between the public and private sectors and to support impartial research that can be used by policymakers at all levels of government. More research is needed to understand the potential opportunities and challenges of these innovative and emerging technologies and guide policy development.
- **System Performance and Management**: The research efforts of AP020 support an integrated and multimodal transportation operations management approach that can interact and/or actively manage supply and demand of the transportation network.
- **Funding and Finance**: AP020 recognizes that the growth of shared and electric mobility can have notable implications on long-term transportation funding and financing, such as reduced private vehicle fuel taxes. AP020 supports an array of public policy research efforts, including those that aim to understand the economic impacts of innovative and emerging transportation technologies and opportunities to fund transportation in the 21st Century.
- **Goods Movement**: In recent years, on-demand courier services have grown rapidly due to advancements in technology, changing consumer patterns, and other trends. AP020 recognizes the importance of this trend and the increasing commoditization of the transportation network where travelers are increasingly substituting physical trips for goods delivery. AP020 seeks to expand understanding of the impacts of urban goods delivery on travel behavior and society.
- **Institutional and Workforce Capacity**: AP020 seeks to contribute to the professional development of public and private practitioners. Additionally, AP020 supports research aimed at understanding the labor impacts of innovative and emerging transportation technologies, such as ridesourcing, shared automated vehicles, and others. AP020 hopes to foster research that provides greater understanding of the impacts of transportation automation on labor and society.
- **Research and Innovation**: AP020 works to promote collaboration on transportation research, education, and technology transfer and serve as an impartial forum for the exchange of knowledge and information, including the relationship between transportation and social, economic, environmental, and other issues. AP020 also seeks to contribute to the public's understanding of transportation and its critical importance to our society.

Synergies and Partnerships

AP020 supports research and knowledge transfer in each of these twelve areas. AP020's strong relationships with AP040 - Automated Transit Systems, AP060 - Paratransit, ABE60 -

Accessible Transportation and Mobility, AHB15 - Intelligent Transportation Systems and other TRB Standing Committees will help us identify cross-cutting issues. The committee has already worked on cross-cutting issues, such as those identified during annual workshops as part of the US Department of Transportation's (DOT's) Mobility on Demand (MOD) program. Additionally, the committee will continue to leverage synergies with the Society of Automotive Engineers (SAE) International and its Shared and Digital Mobility Committee to create standards and best practices of subjects that fall within the scope of this committee. Finally, the committee will continue to support partnerships that enhance the understanding of technology-enabled transportation and serve on other committees and forums as stakeholders and participants to share and exchange ideas and knowledge.

Building a Balanced Membership

The Committee aims to maintain a balanced representation across backgrounds, geographies, and disciplines by having members from academia, industry, public agencies, local government agencies, state and Federal DOTs, associations, private sector, non-profits, and professional organizations. The Committee has three emeritus members who remain active in the Committee's activities, two young members and eight International members. We continue to look for opportunities to further broaden the Committee's demographics with the committee membership rotation in 2019. AP020 attracts a diverse range of friends and members through its scope and activities, as well as the activities of the committee's members and friends. Proactive steps have been taken to encourage young members at the Young Member's Reception. The committee will expand upon its liaison activities in the next three years, and will continue to pursue members from the previously-mentioned representative organizations.

Activities, Participation, Communication, and Outreach

AP020 will foster and encourage committee involvement in a number of ways. These include:

- Hosting at least one workshop every year during the annual meeting;
- Hosting webinars to highlight key outcomes from the workshop;
- Co-sponsoring events and conferences; and
- Encouraging participation in TCRP and other TRB research and outreach activities, including but not limited to: providing perspectives on research needs, writing research needs statements; participating on TCRP (and other) research panels; disseminating research and technology transfer through TRB's ambassadors and other outreach mechanisms; and other activities that will advance the state of the practice.

AP020's communication efforts have been expanded to include new platforms, such as LinkedIn, resulting from a poll of members and friends that was completed in 2017 to inquire about what platform is most desirable. At the 2018 mid-year meeting, the committee discussed the creation of a website. AP020 may expand communication by providing information about committee and liaison partners' activities using additional communication media (e.g., website) and methods. We will continue to share committee efforts, activities and achievements quarterly or biannually through newsletters, LinkedIn posts or webinars. Additionally, members and friends will be encouraged to actively describe their work, research, projects, and industry news on an ongoing basis through various outreach tools.

COMMITTEE HISTORY [2016-2018]

Committee Participation

Category	2016	2017	2018
Current Number of Members (not including Young Members)	28	28	31
Young Members	2	2	2
State DOT Members	1	1	1
International	8	8	8
Diversity			
Male	19	20	20
Female	11	10	13
Minority*	8	8	8
Geographic Representation			
Northwest	1	1	2
Southwest	7	7	7
Central	5	5	4
Northeast	4	4	10
Southeast	5	5	2
International	8	8	8
Total	**30**	**30**	**33**
Employer Type			
Federal Government	1	1	3
State Government	1	1	1
Local Government	1	1	2
Academia	16	15	13
Consultant	5	5	4
Industry/N-P	5	6	10
Other	1	1	
Total	**30**	**30**	**33**

Committee Activity (2016-2018)

Activity Type	2016	2017	2018
Meetings	Number of Meetings		
Annual Meetings (including Sub-Committee Meetings)	3	3	3
Mid-year Meetings			1
Sessions	Number of Sessions		
Lectern	3	2	2
Poster	3	2	2
Co-sponsored Sessions	5	10	8
Specialty Conferences, Workshops	1	1	1
Papers	Number of Papers		
Reviewed	38	60	86
Published	6	7	6

AP020's Subcommittees: Scope and Activities

Shared Vehicle Public Transport Systems Subcommittee AP020(1) and Emerging Ridesharing Solutions Subcommittee AP020(2)

Scope of AP020(1): Due to the growth of shared mobility, a subcommittee on shared vehicle public transport systems is essential to support TRB workshop and session activities and to encourage TRB participation in ongoing activities such as: paper reviews, TCRP panel participation, and other support efforts. The time slot allotted is always full of briefings from industry, academia, and government. As such, the subcommittee regularly attracts more than 50 people necessitating physical meeting space. The subcommittee would not be able to attract such robust participation if it met virtually.

Scope of AP020(2): To promote, facilitate and disseminate research related to emerging tools and methods for increasing the average occupancy of seats in private vehicles, particularly during peak hours when roadway and public transport capacity is fully utilized. Specifically, the Sub-Committee's focus is on incidental, non-commercial ridesharing. The evolution of carpooling, vanpooling, and other pooled services (e.g., taxi sharing, ridesplitting and microtransit) are experiencing a renaissance since the subcommittee's formal creation in 2011. We want to put the focus back on incidental, non-commercial ridesharing vs. commercial services, which can be covered by AP020(1) and reduce the overlap between the two subcommittees. Companies like Waze Carpool and Scoop are changing the way commuters think about "carpooling", while transportation demand management programs include traditional ridesharing and support it. The Emerging Ridesharing Solutions subcommittee is at the epicenter of ridesharing, and the one resource for all practitioners, academics and government agencies to collectively reflect on the state of the industry and research in the field.

The activities of Shared Vehicle Public Transport Systems Subcommittee AP020(1)and Emerging Ridesharing Solutions Subcommittee AP020(2) are:

- Continuing to document and inform transportation community of developments in shared mobility;
- Fostering, disseminating, and publishing leading research (empirical and methodological) in shared mobility;
- Convening workshops, summits, and conferences in shared mobility;
- Bringing together experts, practitioners, academics, industry, non-profits, and students together to discuss and shape future research agenda on shared mobility and how it relates to public transportation (e.g., subcommittee meetings and updates throughout the year);
- Supporting ongoing call for papers and paper reviews;
- Co-sponsoring a TRB workshop on Mobility on Demand with AP020 and AP040;
- Co-sponsoring a webinar and e-circular following the TRB workshop in partnership with AP020 and AP040;
- Organizing paper and poster sessions at the annual and other meetings of TRB as appropriate;
- Hosting the yearly workshop, organizing speakers, inviting attendees, and building the right sessions and breakout groups to discuss topical and emerging issues in public transportation;
- Hosting regular subcommittee meeting at TRB annual meeting;
- Supporting the planning for the Demand Responsive Transportation Conference in Baltimore (Spring 2019);
- Developing the research agenda and research proposals;
- Facilitating and supporting research in the field; and
- Disseminating the results of research in the field.

Circulars

- Transportation Research Circular E-C210 "Multimobility and the Sharing Economy: Shaping the Future Market Through Policy and Research" (July 2016) - Available at: http://onlinepubs.trb.org/onlinepubs/circulars/ec210.pdf
- Transportation Research Circular E-C219 "The U.S. Department of Transportation's Smart City Challenge and the Federal Transit Administration's Mobility on Demand Sandbox: Advancing Multimodal Mobility and Best Practices Workshop" (March 2017) - Available at: http://onlinepubs.trb.org/onlinepubs/circulars/ec219.pdf
- Transportation Research Circular E-C231 "U.S. Department of Transportation's Mobility on Demand Initiative: Moving the Economy with Innovation and Understanding" (March 2018) - Available at: http://onlinepubs.trb.org/onlinepubs/circulars/ec231.pdf

Committee Workshops, Webinars, Co-sponsored Conferences and other Committee Activities

***Multimodal Mobility and Sharing Economy: Shaping the Future Market Through Policy and Research*.**

On January 10, 2016, AP020 hosted the workshop on Multimodal Mobility and Sharing Economy: Shaping the Future Market Through Policy and Research at the 95th Annual Meeting of the Transportation Research Board, held at the Walter E. Washington Convention Center in Washington, D.C. The workshop was sponsored by the following committees and subcommittees: Emerging and Innovative Public Transport and Technologies Committee; Shared-Use Mobility and Public Transit Subcommittee; Emerging Ridesharing Solutions Joint

Subcommittee; and Automated Transit Systems. The workshop facilitated a dialogue among nearly 120 participants from public-sector organizations, private companies, nonprofit research groups, and educational institutions. It included a healthy exchange of ideas among 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 also were considered at the workshop, namely their benefits and challenges for policy makers in ensuring that their safety standards match existing ones.

Four key goals of the workshop included the following: 1) Evaluating the impacts of technology on shared mobility; 2) Initiating a dialogue between public organizations and private companies, especially regarding data-sharing practices; 3) Evaluating the reach of shared mobility beyond dense urban centers; and 4) Discussing current research and policy in evolving technology.

U.S. DOT's Smart City Challenge and the Federal Transit Administration's (FTA) MOD Sandbox: Advancing Multimodal Mobility and Best Practices

On January 8, 2017, the U.S. Department of Transportation (DOT) and the Transportation Research Board (TRB) of the National Academies co-hosted a workshop on the U.S. DOT's Smart City Challenge and the Federal Transit Administration's (FTA) MOD Sandbox: Advancing Multimodal Mobility and Best Practices at the 96th Annual Meeting of the Transportation Research Board in Washington, D.C. The workshop was sponsored by the following stakeholders: 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 Committee (AP040); and Transportation Demand Management Committee (ABE50). The workshop facilitated a dialogue among over 165 participants from public-sector organizations, private companies, nonprofit research groups, and educational institutions. The workshop featured thought leaders and finalists from the 2016 U.S. DOT's Smart City Challenge and FTA's MOD Sandbox. The workshop emphasized the role of public transit, shared mobility, and advanced technology (connected and automated vehicle technology, sensing, cameras, etc.) in the recent competitions, along with next steps and plans for researching the pilot projects and documenting best practices. Sessions featured the U.S. DOT Smart City Challenge winner: Columbus, Ohio, and highlighted pilot projects from the FTA MOD Sandbox, along with selected public–private partnerships and research initiatives on the future of mobility. Government, industry, and academic thought leaders presented and participated in panel discussions with the audience about the pilot projects, public–private partnerships, research, and next steps, emphasizing the future of multimodal mobility. In the second half of the workshop, attendees participated in interactive breakout sessions and reported back on next steps for advancing research and policy understanding in public transport innovation, as well as use cases in the context of a range of use cases (urban, suburban, and rural).

The workshop addressed five key goals: 1) Discussing the interrelated nature of smart cities and MOD; 2) Enhancing public transit industry preparedness for MOD and smart cities; 3) Initiating

a dialogue between public organizations and private companies; 4) Evaluating the reach of MOD beyond dense urban centers; and 5) Discussing current research and policy in light of rapidly evolving technology and service disruption.

U.S. DOT's MOD Initiative: Moving the Economy with Innovation and Understanding
On January 7, 2018, the U.S. Department of Transportation (DOT) and the Transportation Research Board (TRB) of the National Academies of Sciences, Engineering, and Medicine co-hosted this workshop on U.S. DOT's MOD Initiative: Moving the Economy with Innovation and Understanding at the 97th Annual Meeting of the Transportation Research Board, held at the Walter E. Washington Convention Center in Washington, D.C. The workshop was sponsored by the following committees: 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 Committee (AP040); Transportation Demand Management Committee (ABE50); and Regional Transportation Systems Management and Operations Committee (AHB10).
The workshop facilitated a dialogue among more than 150 participants from public-sector organizations, private companies, nonprofit research groups, and educational institutions. The workshop featured U.S. DOT MOD Program leadership, thought leaders, and grantees (public agencies and vendors) from Federal Transit Administration's (FTA) MOD Sandbox. The workshop featured an introduction to the Intelligent Transportation Systems Joint Programs Office (ITS JPO) MOD Concept of Operations; a moderated panel with representatives from three MOD Sandbox sites; and a panel on big data, key metrics, and early findings. Government, industry, and academic thought leaders presented and participated in panel discussions with the audience about the pilot projects, research, and next steps, emphasizing the importance of public–private partnerships.

In the second half of the workshop, attendees participated in interactive breakout sessions on opportunities and challenges from the public- and private-sector pertaining to: 1) Managing/Understanding Pilot Data; 2) Equity and Accessibility; 3) Economic Impacts and Innovative Business Models; and 4) Planning for MOD (land use, zoning). Five key goals of the workshop included: 1) Discussing the interrelated nature of big data, equity, accessibility, economic impacts, and planning for MOD; 2) Enhancing public transit industry preparedness for MOD; 3) Advancing the dialogue between public organizations and private companies; 4) Exploring early lessons learned with three of the MOD Sandbox sites; and 5) Discussing current research and policy in light of rapidly evolving technology and service disruption.

Disrupting Mobility Conference *(November 11-13, 2015)*
This conference featured megatrends disrupting mobility, including globalization, megaregions, urbanization, demographic shifts, and climate change. The conference also fostered a dialogue about the role of technology disrupting mobility, including automated and connected vehicles, mega logistics, social networking, and smartphone apps and the potential of disruptive technologies and services to enable ubiquitous zero-emissions smart mobility. Socio-demographic shifts disrupting mobility were also discussed with an emphasis on access and mobility of special needs populations such as, but not limited to low-income, older adults, disabled, single parents, and zero vehicle households. The conference also featured a hackathon, poster session, and a book of peer-reviewed chapters from conference attendees.

International Conference on Demand Responsive Transportation Services *(April 14-17, 2019)*
AP020 is co-sponsoring the International Conference on Demand Responsive and Innovative Transportation Services in Baltimore, Maryland. The conference will provide a chance to exchange knowledge with international operators; learn from suppliers and academics about advances in information technology, vehicles, and equipment; exchange insights with health care providers regarding health-related transportation, and explore the impacts of transportation network companies on demand-responsive transit.

Research Statements Developed (RNS, synthesis, NCHRP, etc.) with information on title, date submitted, and date last reviewed - TBD

Research Statements Funded – by which organizations, what portion of the original statement has been covered, and how the research is being reviewed or vetted - TBD