Transit Research Analysis Committee Letter Report: November 16, 2011

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Transit Research Analysis Committee; Studies and Special Programs

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

November 16, 2011

Vincent Valdes
Associate Administrator for Research,
Demonstration, and Innovation
Federal Transit Administration
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Dear Mr. Valdes,

On June 30 and July 1, 2011, the Transit Research Analysis Committee (TRAC) convened at your request a series of technical sessions consisting of presentations and panel discussions on the transit ridership experience and related research needs and opportunities. The TRAC summer meeting agenda and list of participants are included in Attachment A. I wish to express special thanks for the introductory remarks made by Robert Bertini, Deputy Administrator, Research and Innovative Technology Administration, and for the guidance and information offered by Bruce Robinson, Deputy Associate Administrator for Research, Demonstration, and Innovation (RDI).

TRAC consists of 12 individuals appointed by the National Research Council for their balance of expertise and experience in public transit. TRAC's standing charge is to "provide an independent review and assessment of the needs of the public transportation industry that could be met through future investment in a national research and technology program." Specifically, TRAC is tasked to advise the Federal Transit Administration (FTA) on "(a) the federal role in transit research . . . (b) high-priority opportunities proposed by the agency, and (c) processes that should

be in place to ensure that FTA receives the input and cooperation of transit research stakeholders." In earlier meetings with TRAC, RDI identified the ridership experience as a high-priority research area, commensurate with FTA's strategic goal of making public transit an even stronger force in enhancing community livability. Other strategic goals of the agency, as identified by RDI, concern transit safety, state of good repair, environmental sustainability, and economic competitiveness.[1]

This is the eighth letter report issued by TRAC since 2005 and the second that provides RDI advice on high-priority research areas. Many of the earlier letter reports concerned RDI efforts to develop a well-informed and strategic basis for its research programming. As noted in these reports, however, RDI had limited discretion to program research because much of FTA's research funding had been earmarked in legislation. During TRAC's discussions with the deputy associate administrator, the committee members learned that the current research funding extension contains virtually no earmarks and thus gives RDI much greater discretion in its research programming. This news is welcomed because it enables RDI to meet more of the research needs identified through its strategic planning efforts. The 2010 TRAC letter report, issued on October 21, advises on appropriate next steps for RDI to support FTA's strategic goal on transit safety. According to the deputy associate administrator, RDI's safety research efforts are proceeding in a manner consistent with this advice. TRAC's reaction to RDI's increased research funding and its safety-related research activities are thus conveyed later in this report.

[1] See the FY 2012 FTA Budget Submission.

Given the influence of TRAC's 2010 letter report, the committee members are pleased to have an opportunity to give additional advice on the research needs associated with improving the transit ridership experience, which aligns with FTA's high-priority research goal on livability. To satisfy their existing and prospective riders, transit agencies have a keen interest in making their services safer, easier to use, and more convenient, comfortable, and efficient. Individual transit users, of course, differ with respect to the aspects of service that are most important to them, even as they share certain interests such as in having reliable and timely information on transit service status. Although some transit users depend heavily on transit for mobility, others have a greater variety of travel and nontravel options. From the standpoint of transit agencies, then, surveying and understanding the specific interests and experiences of riders and nonriders is critically important for making a wide range of decisions related to the structure, scheduling, pricing, amenities, and accessibility of the services offered.

The emphasis of this letter report, therefore, is on advising RDI as it considers early and promising areas of research to support the ability of transit agencies to better understand the interests and experiences of riders. Knowledge gained from this research will put agencies in a better position to improve their services in ways that will lead to more satisfied customers and, potentially, greater transit use. The technical presentations made at the summer meeting serve substantially as the basis for this advice, which represents the committee's best collective judgment. Like all previous TRAC reports, this report was reviewed by an independent group of well-informed peers in accordance with the policies and procedures of the National Research Council.

The next section provides an overview of the technical sessions, followed by TRAC's assessment of the information and relevant recommendations to RDI on research needs and opportunities. TRAC's reactions to RDI's initiatives on safety and its increased discretionary resources for research are then offered. The report concludes by summarizing the tentative plans for TRAC activities over the next year.

SUMMARY OF TECHNICAL SESSIONS ON THE RIDERSHIP EXPERIENCE

The technical presentations during the summer meeting were organized into three panel sessions, as shown in Attachment A. Each panel included researchers and practitioners whose studies and experience cover issues that TRAC believes are pertinent to understanding and satisfying the interests of transit riders. Panelists in the first session were asked to describe the current state of the practice in surveying travelers about their experiences and expectations in using public transit. A second group of panelists was asked to explain how new technologies are filling critical gaps in the information needs of travelers and thereby addressing the chronic problem of schedule uncertainty, particularly for bus services. Panelists in the third session were asked to consider how an entire package of transit service attributes valued by riders, such as those associated with successful bus rapid transit (BRT) and services for small communities, can help attract and retain riders. The three panel sessions could only touch on a few of the many issues associated with the ridership experience. Nevertheless, they offered concrete examples of the challenges and opportunities that transit agencies face in understanding and improving this experience. The 10 panelists were asked not only to discuss how the results of their work have helped transit agencies understand and satisfy rider interests, but also to reflect on information gaps and opportunities for research to fill them.

Session 1: Surveying Riders

Transit agencies often use surveys to obtain insight into who is riding transit and where they are going. Surveys are also used to identify the service attributes that riders find most important. In this session, presenters were asked to describe survey methodologies and applications that can provide transit agencies with a better understanding of rider interests and experiences, so as to enable agencies to make service adjustments. As might be expected, survey methods are increasingly incorporating communications and information technology, such as mobile phones and the Global Positioning System (GPS), to provide a rich array of information on traveler routines, habits, and interests. For example, data provided by the mobile phones of volunteer riders can make traffic monitoring more precise and real time; additionally, tracking the signals of riders enables a greater depth of understanding of route choices. The challenge for transit agencies, however, is in making the best use of this rich and extensive array of data to identify where changes in services are desirable and practical.

Ahmed El-Geneidy emphasized the importance of surveys that go beyond the basic and traditional distinctions between regular transit riders and occasional or nonriders. He noted that regular transit riders are travelers who are "choice" or "captive"; the former have more travel choices, including the option of foregoing travel. El-Geneidy noted the importance of surveys that can identify and distinguish between such individuals, so that the service attributes that are most important to them can be better understood and perhaps better met. In evaluating rider surveys, he has found, for instance, that choice transit riders place a heavy emphasis on reliability and service type, whereas choice nonriders place a high value on service comfort. He thus cited the need for additional research on survey methods to ascertain the characteristics of

transit services that are most relevant to different individuals according to such carefully considered distinctions.

Kathryn Coffel described a research project she leads to understand how intelligent transportation system (ITS) data collected by transit agencies can be better used for transit market research, including research on the ridership experience. This type of data provides detailed information about the location and movement of vehicles and riders using either individual GPS locators or vehicle tracking devices. She described cases where ITS data have helped transit agencies reduce the number of bus stops (and thereby speed up service) and provide new route information in appropriate languages for bus and rail stations in different parts of a transit service region. She noted how in each case, the use of these data helped identify the needs and interests of transit users and thereby enabled changes in services to accommodate them. In pointing out that such data are routinely collected by agencies, she expressed concern that these data often go unexploited for such purposes. She believes research can help identify the existing sources of such data and how they can be used more effectively by transit agencies to understand and meet the interests of their riders.

Marcelo Oliveira and Jesse Casas described their use of GPS technology to conduct rider surveys. They explained how the use of GPS-enabled personal digital assistant devices, coupled with personal interviews, allowed them to obtain more complete and accurate observations of trip-making activity in concert with the expressed interests of travelers. They noted that advances in consumer technologies such as smart phones have the potential to enhance the precision and completeness of such surveying, and they believe additional research is needed not only to assess

the full array of opportunities for such applications, but also to examine perceived limitations, such as concerns associated with confidentiality and personal security.

Together, the three presentations support the need for more precise and useable information on traveler interests and expectations. They suggest that advances in everyday consumer technologies such as smart phones are providing the opportunity to help meet this need by providing a richer array of data on rider experiences. At the same time, however, the presentations indicated the importance of ensuring that transit agencies can make effective use of this information. It was pointed out that many transit agencies already have a great deal of potentially useful data at their disposal, such as information gathered from the sale and use of transit smart cards, information from automatic passenger counters, and other basic operational data. These data too can reveal much about the interests and experiences of riders, but they are often neglected for such potentially valuable purposes. Research on ways to use both new and longstanding data on rider interests and experiences appears to be warranted. For instance, research could be done to develop methodological procedures that would enable transit agencies to assess whether and how electronic and wireless data could be used to measure service performance and changes in ridership characteristics.

Session 2: Embracing Technologies

Consumer technologies are affecting public transit in a multitude of ways. Because of technology, cash is no longer the only—or even primary—method of fare payment on many systems and printed schedules are no longer the only means by which riders track and determine the next transit vehicle's arrival time. Transit agencies recognize that it is important, and even

necessary, to embrace the new capabilities that consumer technologies offer to serve the growing segment of the population that is technology savvy without, at the same time, adversely affecting those riders who do not have access to or interest in such technology. Disseminating information in multiple formats, such as through audio and visual means, is part of the challenge in exploiting these new technologies. Panelists in this session were thus asked to describe technological applications that can and are benefiting riders and to address how targeted research could further the positive impact of these applications.

Kim R. Green discussed advances in fare collection methods and technologies. He pointed out that smart cards are a primary means of collecting fares today, but that open payment technologies that allow riders to pay with a regular credit or debit card are becoming more popular, particularly on rail systems. He noted that smart phones and bar codes displayed on them are also likely to become more commonly used. Because such payment methods can make it easier for individuals to use transit, he believes these methods are improving the overall ridership experience. Expanding the opportunity for riders to use a wider array of electronic payment methods, however, may require industrywide standards for interoperability that will need to involve both financial institutions and governmental agencies. Research to support such standard setting represents a potential opportunity for FTA.

Alan Borning illustrated the fast-changing state of the practice for real-time transit arrival information by describing the OneBusAway software he developed with the help of graduate students. This program provides real-time information about both schedules and arrival times for transit vehicles via the Internet, phone, mobile phone text messages, and smart phone

applications. The software works with a wide variety of transit agencies to allow a user to quickly and easily determine when the next transit vehicle will be arriving at any stop. He noted that previous research has shown that having access to such real-time information has a positive impact on rider satisfaction, which he believes is confirmed by experience in Seattle, Washington, with OneBusAway. He reported that satisfaction with the city's bus service increased significantly among program users. With knowledge about the status of an arriving bus, riders felt both safer waiting at bus stops and could better time their trip making. Borning identified research needs, including the importance of understanding how riders who do not have access to technologies such as smart phones are likely to be affected by a possible transformation in the conveyance of bus scheduling and status information. He also noted the importance that standardization of service schedules and status information could play in ensuring that such technological capabilities can be effectively exploited, and he stressed the need for research to address this data need in ways that do not deter innovation.

Joshua Robin described the Massachusetts Bay Transportation Authority's process for making vehicle schedule and status data openly available to Internet and smart phone software developers. He emphasized that transit agencies do not have expertise in software development and thus should give independent developers ready access to these data. He believes third-party software and smart phone application developers are becoming a significant resource for transit agencies, who benefit not only by foregoing the expense of developing the applications but also by having more satisfied riders. Like Alan Borning, he believes that access to real-time transit data improves not only the ability of users to make use of transit services, but also the public's perception and acceptability of transit generally. He pointed out that Google has acted as a de

facto transit data standard by encouraging agencies to provide data compatible with its widely used software. Research may be able to identify how transit agencies can better open their data by using standard protocols so that software innovators can make more effective use of the information.

All three presenters noted the transformative role that smart phones are playing in changing the experiences and perceptions of transit users. They also indicated that the use of this technology is just beginning to be exploited by software developers, transit agencies, and riders. They believe many more innovative uses await and must be encouraged. While acknowledging that excessive standardization could put innovation at risk, they noted the importance of some standardization for third-party data availability, storage, and interoperability. They suggested that targeted research may be warranted to identify where such standardization may be desirable from a user and operator perspective. The expanding use and capabilities of smart phones also present equity issues that may warrant research—for instance, on methods to ensure that real-time travel information and convenient means of fare payment are available to the still-significant proportion of the traveling public that does not have access to smart phone technology or has visual or hearing impairment.

Session 3: Essential System Characteristics

In this final session, panelists were asked to describe essential system characteristics that affect rider satisfaction and usage rates. Given the variety in transit market sizes and rider bases, no single set of system characteristics can appeal to all riders or be practical to provide across all systems. Panelists were thus asked to identify some of the key characteristics of service that tend

to appeal to riders and to discuss how these characteristics can be addressed through alternative means.

Jennifer Flynn identified several tangible and intangible attributes of BRT that seem to appeal to users. She noted that while the conventional wisdom is that riders favor rail over bus transit, her research has found that the specific attributes of the service are more relevant than the specific type of service. Using Los Angeles, California, as a case study, she found that BRT scored as highly with riders as light rail transit (LRT), because both offered access to efficient and reliable service. She also found that the combination of these tangible service attributes, as well as certain intangible ones, such as safety at transit stops and ease of use, can significantly improve the image of transit, helping to attract new riders and retain existing ones. Ms. Flynn recommended additional research on the tangible and intangible factors that exist in a variety of urban contexts. On the subject of attracting and retaining riders, she recommended research focused on the interests and experiences of former transit users, who are often overlooked in studies but can provide insights on ways to retain riders.

Graham Carey discussed the concept of a bus lane with intermittent priority (BLIMP) system to illustrate how BRT can be a cost-effective alternative that can be as efficient and fast as more costly LRT options. A BLIMP system uses dynamic overhead signs and in-pavement lights to create temporary bus-only lanes that are synchronized to the movement of the bus. He noted that a BLIMP system is appealing in concept because its installation cost is potentially low, it can be implemented quickly, and it preserves mixed traffic. Further research is warranted to determine the traffic situations in which the use of a BLIMP system would be most effective in providing

faster and more reliable BRT service. More generally, however, Carey believes that a BLIMP system is one of many innovations that can make bus operations more efficient and reliable, and thus more comparable to LRT in both real and perceived terms. He believes research on low-cost means of retrofitting bus services to yield these outcomes is warranted and could prove valuable to many smaller and medium-size agencies.

Jill Hough described the challenges faced by small and rural transit systems in meeting the needs of riders. She noted not only that riders of these systems tend to have different priorities and trip purposes than riders in large urban systems, but that they also present different challenges to understanding their interests and experiences. In particular, she has found that rural elderly transit users are often unwilling to make any critical comments about the service, partly out of concern that negative comments could lead to the transit being reduced or withdrawn. She believes that the system characteristics that are most important to transit users in rural and small communities are not well understood and that more research on this topic is warranted to enable providers of these vital services to meet their customers' needs.

The research on BRT versus LRT indicates that the system characteristics transit riders indicate a preference for may not always align with observed and revealed service preferences. Understanding the service attributes that are most valued by riders is important for small and medium-size systems that must carefully target their system upgrades. More research is needed to understand how stated and expressed preferences can differ. In the case of rural systems, obtaining candid data on rider preferences is challenging and thus may be a candidate for further research.

RECOMMENDATIONS FOR FTA RESEARCH ON THE RIDERSHIP EXPERIENCE

The technical presentations discussed above offer ideas on needed research. A common theme through all of them is the importance of how good data and research methodologies are critical to assessing ridership interests and experiences. New technologies are enabling a wealth of new data to be collected and evaluated. What transit agencies often lack, however, is the capability to evaluate and assess the data. In this regard, FTA should consider how its research can help agencies to improve the collection, management, and application of relevant information. Doing so includes analyzing and making better use of both new and existing customer survey and operational data, particularly through research on data evaluation and mining tools and the training required for transit agency staff to better manage and analyze the data. Research to understand the interests and experience of nonriders and former riders is also needed to retain riders and expand the customer base. The concept that each customer has a "life cycle" can help agencies keep abreast of the changing needs and interests of their riders. Identification of the hierarchy of needs of various groups would provide information that would be directly useful to agencies and other providers. It could help both agencies and FTA, for instance, to assess project and service plans according to more explicitly identifiable rider impacts. Cohort studies that examine changing interests at different stages of travelers' lives, longitudinal studies, and before–after research were mentioned as possible means for identifying these interests and may warrant further consideration by RDI.

The presentations revealed how advances in everyday consumer technologies such as smart phones have the potential to transform the ridership experience by making scheduling and service status information more timely and transparent. This potential is just beginning to be

exploited, and transit agencies must encourage it. FTA should consider how its research could assist in this regard by assessing where standardization of the formatting of open-source transit scheduling and service data is warranted. Transit agencies also must ensure that riders who do not have access to these technologies are not neglected. FTA should consider how it can conduct research on the ways in which all riders can benefit from the capabilities provided by advances in consumer technologies.

Finally, understanding the service attributes valued by riders is important for all transit systems, but especially for small (including rural) and medium-size systems that have limited resources for targeting upgrades. FTA should consider how its research can help these agencies obtain candid data on riders' interests, expectations, and preferences. As always, part of the challenge is to identify the research that is needed but unlikely to be generated by transit agencies, private sector entities, and academia.

PROGRESS SINCE THE LAST TRAC LETTER REPORT

As already indicated, TRAC is pleased to learn that RDI has far greater discretionary resources available for research because of limited earmarking. Figure 1 shows the trends in discretionary and nondiscretionary research funding and how this recent development is a marked change from recent trends. Making good use of these resources requires strategic planning, as advised in previous letter reports. In this regard, TRAC notes that RDI's core research program, the National Research Program, proposes $20 million for discretionary research to increase ridership, improve operating efficiency, understand the service needs of rural and targeted populations, improve planning and service projections, advance safety, and provide research

leadership to address other major issues facing the transit industry. It will be important for RDI to make wise programming decisions to demonstrate the value of this discretionary research and the ability of RDI to allocate the resources most effectively.

TRAC also notes that FTA's 2012 budget proposal calls for a split in the existing research program into two separate program areas: one for research and development activities and another for technical assistance and workforce development. In prior years, technical assistance and workforce development were funded through FTA's National Research Program account. The proposed split makes good sense, as these are distinct activities. TRAC concurs with RDI's justification that making this split will better align research funds with applied research and demonstration projects. Separating the accounts will give greater prominence to FTA's research activities, commensurate with the agency's critical national research role. In its budget proposal, FTA emphasizes the use of the National Research Program to support research not generally undertaken by the private sector, including studies on transit policy issues, operational efficiency, and travel behavior. It also emphasizes the need for safety-related research. Although TRAC did not examine this budget proposal in depth during its summer meeting, members look forward to learning more about how RDI intends to use the discretionary funds when it meets with RDI later in the year.

FIGURE 1 FTA National Research and Technology Funding Levels, 1992 to 2011 (SOURCE: RDI).

Recognizing that FTA may be called on to exercise a more prominent role in transit safety oversight, RDI is in the process of developing a Transit Safety Research Roadmap to direct the agency's research in this area. Development of such a road map is critical to ensuring that research results are available to guide agency decision making. Such a planning document is necessary even in the absence of a safety regulatory role for FTA, because transit safety is an issue of national significance that warrants an active FTA research program to help inform the

decisions of transit agencies as well as those of state safety oversight entities. The plan's statement of work calls for an assessment of existing safety research models that could be applicable to FTA, a background review of transit safety data to identify areas where FTA should prioritize research efforts, and a determination of how safety research should support any potential expanded role for FTA in transit safety oversight. TRAC concurs with this approach and its emphasis on deliberate research planning and looks forward to RDI reporting on the progress it has made in developing and implementing the safety research plan.

NEXT STEPS FOR TRAC

The deputy associate administrator indicated during the summer meeting that TRAC should continue to convene technical sessions for research related to FTA's other priority areas. In particular, he expressed an interest in sessions on the state of good repair. This topic dovetails well with safety and is also clearly important to meeting rider needs for service reliability. Specific topics considered during the meeting that may be candidates for the 2012 TRAC summer meeting include the following:

- How agencies use data on system conditions to support management decisions about system and fleet maintenance as well as repair priorities;
- What the role of data is in assessing the useful remaining life of vehicles;
- What are the best practices for maintenance in transit agencies of varying fleet sizes; and
- How priorities are set for other modes, such as highways, to maintain a state of good repair.

TRAC expects that at its winter meeting, RDI will be prepared to discuss plans for the 2012 summer meeting in greater detail.

CONCLUDING COMMENTS

On behalf of the committee, I would again like to thank the FTA staff, along with all the presenters, for providing a very stimulating and productive set of presentations and discussions. I trust the results will be useful to you and your staff. I would also like to thank the TRAC members and staff for their hard work and contributions. In advance of the winter meeting, I intend to communicate with you and the deputy associate administrator to confirm your interest in the state of good repair as a topic for the 2012 summer meeting and to consider further how the panel sessions should be organized.

Sincerely,

J. Barry Barker, Chairman

Attachment

Attachment A

Transit Research Analysis Committee
Research to Improve the Transit Ridership Experience

AGENDA

Keck Center of the National Academies
500 Fifth Street, NW
Washington, DC 20001
Room 201

Thursday, June 30, 2011

CLOSED SESSION (TRAC Committee and TRB Staff Only)

7:45–8:25 a.m. (with continental breakfast): **Committee Planning Session**

OPEN SESSION

8:35–8:50 a.m. **Welcome and Introductions**
J. Barry Barker, Chair, TRAC
Bruce Robinson, FTA

8:50–9:10 a.m. **Kickoff Speaker**
Robert Bertini, Deputy Administrator, Research and Innovative Technology Administration

9:10–11:10 a.m. **PANEL SESSION 1**: **Methods of Surveying Riders**
Moderator: Anna M. Barry, TRAC Member

Panelists:
Ahmed El-Geneidy, Professor, McGill University
Understanding the Needs of the Transit Market

Kathryn Coffel, Principal, Kathryn Coffel Consulting
ITS Data in Transit Market Research

Marcelo Oliveira, Project Director, GeoStats
Jesse Casas, Research Director, NuStats
Innovative Technologies to Improve On-Board Surveys

Q&A and Discussion

11:15 a.m.–12:30 p.m. **PANEL SESSION 2**: **Amenities and Technologies for Riders**

Moderator: Barbara Cline, TRAC Member

Panelists:

Kim R. Green, President, GFI Genfare
Smart Cards and Other Fare Payment Methods

Alan Borning, Professor, University of Washington
Real-Time Bus Information

Joshua Robin, Director of Innovation, Massachusetts Bay Transportation Authority
Massachusetts Bay Transportation Authority's Smart Phone Apps and Other Technologies

12:30–1:30 p.m. **LUNCH**

1:30–3:15 p.m. **PANEL SESSION 2 (Continued)**: **Amenities and Technologies for Riders**

Q&A and Discussion

2:00–4:00 p.m. **PANEL SESSION 3: Service Attributes That Interest Riders**

Moderator: Barry Barker, Chair, TRAC

Panelists:

Jennifer Flynn, Senior Research Associate, Center for Urban Transportation Research, University of South Florida
BRT Image and Perception

Graham Carey, York Consortium (AECOM)
Experience with BLIMP and Other Signal Priority Systems

Jill Hough, Director, Small Urban & Rural Transit Center, Upper Great Plains Transportation Institute, North Dakota State University
Issues for Small Transit Systems

Q&A and Discussion

4:00–4:15 p.m. **Break**

4:15–5:00 p.m. **Plenary Wrap-up and Closing Remarks**

5:30 p.m. **Reception and Light Buffet (Outside Room 100)**

Friday, July 1, 2011

CLOSED SESSION (TRAC Committee and TRB Staff Only)

8:00–8:45 a.m. (with continental breakfast): **Committee Discussion**

OPEN SESSION

9:00–10:30 a.m. **Discussion with FTA of Workshop Results: Issues Raised, Gaps Identified, Potential Research Needs**

Overall Outcome of Workshop
J. Barry Barker, Chair, TRAC

Panel 1: Key Research Issues, Outcome, and Research Action Agenda
Anna Barry, TRAC Member

Panel 2: Key Research Issues, Outcome, and Research Action Agenda
Barbara Cline, TRAC Member

Panel 3: Key Research Issues, Outcome, and Research Action Agenda
J. Barry Barker, Chair, TRAC

FTA Assessment
Bruce Robinson, FTA

10:30–10:45 a.m. **Break**

10:45 a.m.–12:00 p.m. **Next Steps and Follow-on Workshop Topics**

12:00 p.m. **LUNCH and Adjourn**

PARTICIPANT LIST

Committee

J. Barry Barker, Executive Director, Transit Authority of River City, *Chair*
Ann August, Executive Director, Santee Wateree Regional Transportation Authority
Anna M. Barry, Senior Director, Vehicle Procurement and Quality Assurance, Massachusetts Bay Transportation Authority
Linda Bohlinger*, Vice President and Director of National Management Consulting, HNTB Corporation
Charles A. Carr, Public Transit Director, Mississippi Department of Transportation
Barbara Cline, Executive Director, Prairie Hills Transit
Kim R. Green, President, GFI Genfare
Lester A. Hoel,* Professor, University of Virginia
Ralf Resch, Secretary General, European Centre of Employers and Enterprises Providing Public Services
Jeffrey Rosenberg,* Legislative Director, Amalgamated Transit Union
Susan Shaheen, Lecturer and Co-Director, Transportation Sustainability Research Center, University of California, Berkeley
Linda S. Watson,* President and Chief Executive Officer, Capital Metropolitan Transportation Authority

*Not in attendance

Speakers and Discussants

Robert Bertini, Research and Innovative Technology Administration
Alan Borning, University of Washington
Graham Carey, York Consortium (AECOM)
Jesse Casas, NuStats
Kathryn Coffel, Kathryn Coffel Consulting
Ahmed El-Geneidy, McGill University
Jennifer Flynn, National Bus Rapid Transit Institute, Center for Urban Transportation Research, University of South Florida
Kim R. Green, President, GFI Genfare
Jill Hough, Small Urban & Rural Transit Center, Upper Great Plains Transportation Institute, North Dakota State University
Marcelo Oliveira, GeoStats
Joshua Robin, Director, Innovation and Special Projects, Massachusetts Bay Transportation Authority

Other Attendees

Bruce Robinson, FTA
Michael Baltes, FTA
Walt Kulyk, FTA
Fred Williams, FTA

Christina Gikakis, FTA
Matt Lesh, FTA
Venkat Pindiprolu, FTA
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