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**Aligning Data Systems  
to Communicate with  
Decision Makers**

*A Peer Exchange*

April 26–27, 2014  
Miami, Florida

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# **Aligning Data Systems to Communicate with Decision Makers**

## ***A Peer Exchange***

April 26–27, 2014  
Miami, Florida

*Prepared by*  
Katherine F. Turnbull  
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*for the*  
Transportation Asset Management Committee  
Special Task Force on Data for Decisions and Performance Measures  
Transportation Research Board

December 2014

Transportation Research Board  
500 Fifth Street, NW  
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## TRANSPORTATION RESEARCH CIRCULAR E-C191

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### **PUBLISHER'S NOTE**

This Transportation Research E-Circular was prepared by Katherine F. Turnbull, Texas A&M Transportation Institute, as a factual summary of what occurred at the peer exchange. The committee's role was limited to planning the peer exchange. The summary reflects the statements of peer exchange participants and does not necessarily represent the views of all peer exchange members, the planning committee, or the National Academies.

## Introduction

The Peer Exchange on Aligning Data Systems to Communicate with Decision Makers was held in Miami, Florida, on April 26–27, 2014, in conjunction with the 10th National Conference on Transportation Asset Management. Organized by the Transportation Research Board of the National Academies, the peer exchange focused on communicating with decision makers on transportation asset management, economic development opportunities, and system performance. The TRB Committee on Transportation Asset Management and the Special Task Force on Data for Decisions and Performance Measures supported the peer exchange.

Peer exchange participants came from state departments of transportation (DOTs), FHWA, universities, consulting firms, AASHTO, and a transit agency. A total of 14 state transportation agencies were represented at the peer exchange. Participants included four agency chief executive officers; one chief operations officer; and personnel responsible for communications, information technology, data collection and analysis, and research.

This summary, which is organized into three sections following the introduction, presents key elements discussed at the peer exchange. The peer exchange format is described next, followed by an overview of the major themes emerging from the presentations and discussions. Examples highlighted by participants are included in this section. The summary concludes with a description of potential follow-up activities, including facilitating ongoing dialogues among affinity groups, developing and using outreach materials targeted toward governors and legislators, and conducting research on specific topics. A list of the peer exchange planning group members is provided on [page ii](#) and a list of participants is provided at the end of this E-Circular.

## Peer Exchange Format

The objective of the peer exchange focused on exploring information needs to support current and anticipated transportation asset management decisions, identifying gaps in the capacity to meet those needs, and defining actions to improve capacities to provide appropriate information to decision makers. To accomplish these objectives, the peer exchange included three panels, open discussions, and cross-functional roundtable dialogs. Panelists provided presentations and comments addressing featured topics followed by facilitated discussions. The common themes and potential follow-up activities were highlighted during the concluding session.

### VISIONS ON CURRENT AND FUTURE SCENARIOS PANEL

The first panel was comprised of three chief executive officers (CEOs) and one chief operating officer (COO) from four state DOTs and a CEO from a public transit agency. Presentations and discussions focused on current roles and responsibilities, visions for future roles and decision scenarios, communicating with decision makers, and measuring performance.

#### **Chief Executive Officers**

- Carlos M. Bracerias, Executive Director, Utah DOT;
- Gregory C. Johnson, Chief Operations Officer, Michigan DOT;
- Michael P. Lewis, Director, Rhode Island DOT;
- Ysela Llort, Director, Miami–Dade County Transit; and
- Paul Trombino, Director, Iowa DOT.

### COMMUNICATING WITH THE PUBLIC AND POLICY MAKERS PANEL

The second panel focused on communicating with the public and policy makers. It featured communication personnel from five state DOTs. Panel members described crafting messages, using different delivery methods, and obtaining feedback from various groups. Examples of successful strategies and approaches were highlighted.

#### **Communications Personnel**

- Paul Trombino, Director, Iowa DOT;
- Terri Angier, Chief of Media and Public Relations, Oklahoma DOT;
- Andrea Henry, Director, Office of Strategic Communications, Iowa DOT;
- Dick Kane, Director of Communications, Florida DOT;
- Karla Rains, Customer Relations Director, Minnesota DOT; and
- Peg Schmitt, Public Affairs Director, Wisconsin DOT.



## DATA, INFORMATION, AND TECHNOLOGIES TO SUPPORT DECISION MAKERS PANEL

The third panel addressed data, information, and technology to support agency CEOs and decision makers. Panelists included personnel from five state DOTs and a company specializing in geographic information systems and related applications. Topics covered in this panel focused on data needs for decision making, technology for collecting and analyzing data, data gaps, and future opportunities to enhance data collection, integration, analysis, and presentation.

### Data and Information Personnel

- Timothy A. Henkel, Assistant Commissioner, Minnesota DOT;
- Terry Bills, Transportation Industry Manager, ESRI;
- Frank Desendi, Manager, Geographic Information Division, Pennsylvania DOT;
- Gordon Kennedy, Manager, Information Resource Management, Washington State DOT;
- Gregory L. Slater, Director, Office of Planning and Preliminary Engineering, Maryland State Highway Administration; and
- Mark Suarez, Louisiana DOTD.

## COMMON THEMES AND EXAMPLES

A number of common themes emerged from the panel presentations and follow-up discussions. These themes, which focused on the following eight areas, are described in this section, along with examples presented during the peer exchange.

- Transportation assets are important.
- Asset management is more than just infrastructure: data as an asset.
- State DOTs and transit agencies are enablers of economic development.
- Leadership is key.
- Strategic direction, performance measurement, and accountability are important.
- Changing organizational cultures and new skill mixes are needed.
- Good data are key: data collection methods and tools are changing.
- Communication: messages and methods.

### Transportation Assets Are Important

The importance of maintaining transportation infrastructure and other fixed assets was discussed by peer exchange participants. It was noted that transportation infrastructure represents a major portion of state-owned physical assets. Maintaining these assets is a key responsibility of state DOTs and transit agencies, as well as airport and port authorities. It was noted that transportation asset management is being embraced by transportation agencies at all

levels. Participants described the different types of fixed transportation assets and methods for collecting, analyzing, and retaining data on different types of assets. Participants also discussed the importance of asset management for data-driven decisions on future investments. The following examples of pavement management data collection in Louisiana and transit asset management in Miami were highlighted at the peer exchange.

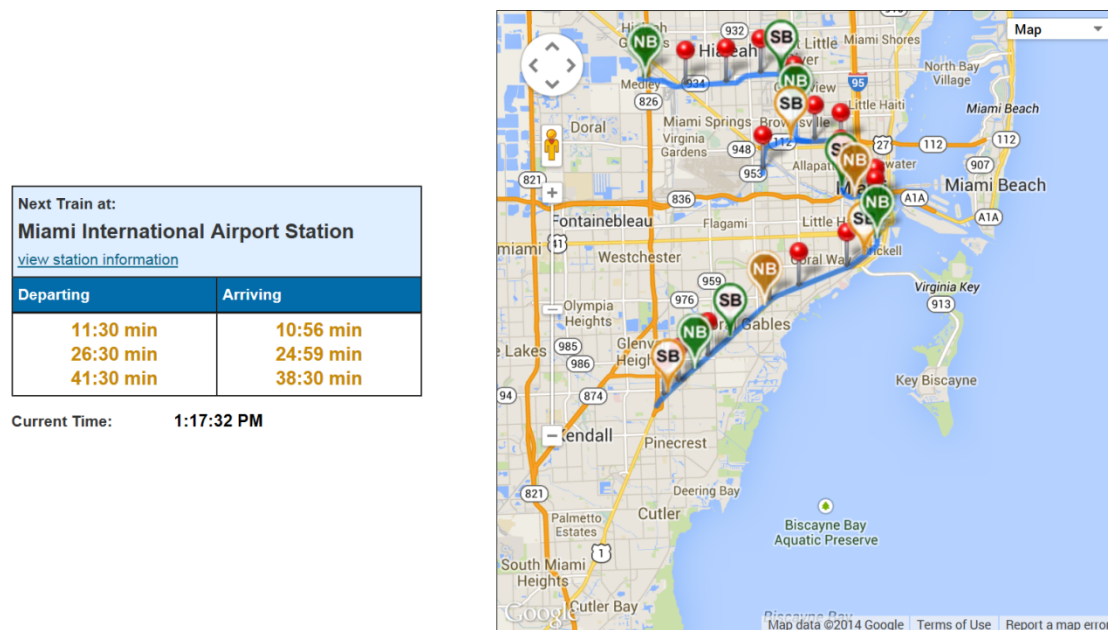
- **Louisiana DOTD Pavement Management Data Collection.** The Louisiana DOTD collects data on pavement conditions on 20,000 mi of National Highway System (NHS) and state system roads on a regular basis. Pavement data and video are collected every other year for the state system. Pavement data on the NHS are collected every year, with video collected every other year. The cost of this data collection is approximately \$1.5 million per year. The raw data includes pavement images and image data from windshield surveys. Processed data include summarized raw data for segments of 1/10 mi, life-cycle data, and life-cycle cost data. The raw summarized data are also used to develop the pavement index, which can be compared across facilities. Approximately five full- and part-time staff provide quality assurance—quality control by reviewing and checking the data.

- **Miami–Dade County Transit: Asset Management for Multiple Transit Modes.** Miami–Dade Transit operates Metrorail, Metromover, and Metrobus. It owns the infrastructure and the fixed assets associated with these different transit modes, including tracks, guide ways, stations, vehicles, maintenance facilities, bus shelters, and bus stop signs. The EasyCard fare collection system also represents an important asset. It was suggested by speakers that transit is a supply chain for people. Transit picks up, transports, and distributes people. Having the right asset in the right place at the right time is the key to providing person logistics. Documenting and maintaining these assets is the focus of transit state of good repair.

### **Asset Management Is More Than Just Infrastructure: Data as an Asset**

Peer exchange participants suggested that while infrastructure and physical assets are a major focus for transportation agencies, data and information are also key assets. Members of the CEO panel described state DOTs and transit agencies as vendors of information. Stressing the importance of data, it was further suggested that state DOTs were moving from being infrastructure agencies to becoming information agencies. Participants noted that this transition is not easy. The need to better understand what data and information are of value to different user groups was suggested by participants. For example, market-driven data, rather than system-oriented data, was suggested as important. The importance of accurate and timely data was also stressed by participants. The following example of real-time transit information in Miami presented at the peer exchange provides one example of data as an asset.

- **Miami–Dade County Transit Metrorail, Metromover, and MetrobusTracker.** The Miami–Dade Transit Tracker online service provides the estimated time of arrival for the next train, mover, or bus at specific stations and stops. The system can be accessed from the Miami–Dade Transit website as illustrated in [Figure 1](#) and provides both the arrival and departure times and a map illustrating the location of the next train, mover, or bus approaching a station. It was noted during the peer exchange that a record number of calls were received by the agency the day the Tracker service was not in operation due to a computer problem.



**FIGURE 1 Example of Miami Data Transit Tracker Service: next MetroRail train at the Miami International Airport station. (Source: Miami-Dade County Miami Dade Transit website.)**

## State Departments of Transportation Are Enablers of Economic Development

Peer exchange participants discussed the important link between transportation and the economy. It was suggested that a key role of state DOTs and transit agencies was to support economic development in communities and states. Participants voiced the view that transportation is not an end to itself and that transportation agencies are enablers of economic development and other activities. For example, transit and roadways do three main things: they move people, they connect places, and they create economic development opportunities. Establishing good working relationships with state and local economic development agencies and groups was suggested as important to maximize the economic benefits from transportation improvements. The Iowa DOT's work analyzing key supply chains in the state described below provides one example of the link to economic development presented at the peer exchange.

- Iowa DOT Supply Chain Optimization Strategy.** The Iowa DOT is examining supply chains for major agricultural commodities and products in the state, as part of the freight transportation network optimization strategy. The strategy focuses on identifying and prioritizing investment opportunities to optimize the freight transportation network in the state to reduce transportation costs for existing businesses and to promote business growth. The approach includes examining supply chain networks and network designs, assessing demand-based freight transportation network optimization, and developing business cases for specific commodities and products. Data from the Bureau of Transportation Statistics' Commodity Flow Survey, FHWA's Freight Analysis Framework 3, the U.S. Department of Agriculture, export records, iTRAMS's county level freight flows, Iowa DOT, industry groups, and other

sources are used in the analysis. Supply chains for cereal grains were among the first to be examined. Based on the propane shortage experienced in the state during the winter of 2013–2014, a propane supply chain optimization strategy was also undertaken. The results from these analyses will allow the Iowa DOT and other agencies in the state to be more proactive in addressing freight bottlenecks and making improvements to enhance the competitiveness of existing and potential businesses.

### **Leadership Is Key**

Participants suggested that support for asset management, strategic direction, performance measurement, and supporting economic development must begin at the top levels of transportation agencies. It was further suggested that the agency CEO is key to establishing the vision and goals for an agency, as well as setting the priorities. It was noted that the state DOTs and transit agencies at the forefront of developing and using asset management, performance measurement, and data-driven decision making have strong CEOs and top management teams. It was further suggested that top-level leadership is important for the organizational changes discussed in the next theme. Participants noted that CEOs with good leadership skills can help move agencies forward more quickly and are more likely to build good working relationships with other agencies, policy makers, the public, and private-sector groups. Thus, it was suggested that strong leadership has both an outward and an inward focus. As noted in the section on follow-up activities, participants identified a need to reach out to other transportation CEOs to participate in future peer exchanges, workshops, and related efforts.

### **Strategic Direction, Performance Measurement, and Accountability Are Important**

Peer exchange participants identified and discussed the importance of establishing and maintaining strategic direction, performance measurement, and accountability at transportation agencies. The need for transparency and open decision-making processes was also noted as important by participants. It was further suggested that these elements established the integrity of an agency and are key to interacting with policy makers and the public, especially in obtaining funding for transportation. The Utah DOT Strategic Direction report discussed during the CEO panel and highlighted below provides one example of this approach.

- **Utah DOT Strategic Direction.** Since 2003, Utah DOT has developed an annual Strategic Direction and Performance Measures report. The document, which is illustrated in [Figure 2](#), presents the major accomplishments during the year related to Utah DOT's four strategic goals—preserve infrastructure, optimize mobility, zero fatalities, and strengthen the economy—and the priorities for the next year. The document also highlights Utah DOT's emphasis areas and core values. Performance measures are reviewed in the report, with a focus on outcomes. Distributed at the beginning of each year before the legislative session, the Strategic Direction report provides a consistent means of communicating Utah DOT's priorities and performance to policy makers and the public.



**FIGURE 2** Utah DOT's strategic direction report and four strategic goals. (Source: Utah DOT.)

### **Changing Organizational Cultures and New Skill Mixes Are Needed**

Peer exchange participants noted that developing and implementing asset management, data-driven decision making, and related programs often require changes in organization cultures. Participants suggested that CEOs and top leadership within agencies are keys to facilitating and promoting these changes. Examples of changes may include breaking down silos among different parts of the agency to share data, changing the mindset from an infrastructure-based agency to a data-driven agency, including more modes and more nontraditional assets, and fostering and nurturing transparency and accountability.

Participants also discussed the need for a workforce with a more diverse set of skills. Rather than only the traditional engineering and planning expertise, employees with skills in communication, public engagement, management, computers, technology, data analysis, statistics, and other related fields are needed. Participants further suggested that personnel who are able to work across departments, with other agencies, and with the public will be in high demand.

The need for enhancing the communication skills of all employees, especially those who interact with the public, was discussed by participants. It was further suggested that individuals interacting with policy makers and staff from other agencies also need strong communication skills. Participants noted that the traditional technical professionals at state DOTs and transit agencies do not always have these skills.

### **Good Data Are Key: Data Collection Methods and Tools Are Changing**

Participants discussed the need for accurate and timely data. Good data are key for asset management, performance measurement, strategic planning, operations, and other



responsibilities of transportation agencies. Accurate data is also critical for providing customers with information on the real-time status of services, such as the Miami–Dade Transit Tracker System described previously. One participant suggested that better data equates to better performance, which equates to better value.

Peer exchange participants also discussed the changing nature of data collection and analysis methods and tools. The ability to use advanced technologies to enhance data collection for asset management, performance measurement, and real-time operations was noted as a major advancement. It was further suggested that these opportunities also present challenges in maintaining new technologies and training and retaining staff with the technical skills to use the tools and technologies. The need to integrate new data collection methods with data from legacy systems, across different agency divisions, and between agencies was also noted as a challenge. The Utah DOT UPlan geographic database was described as one example of an interactive planning and analysis tool that integrates a wide range of data from Utah DOT and other agencies into one system. The mantra of “collect data once, use it multiple times” was also voiced by participants.

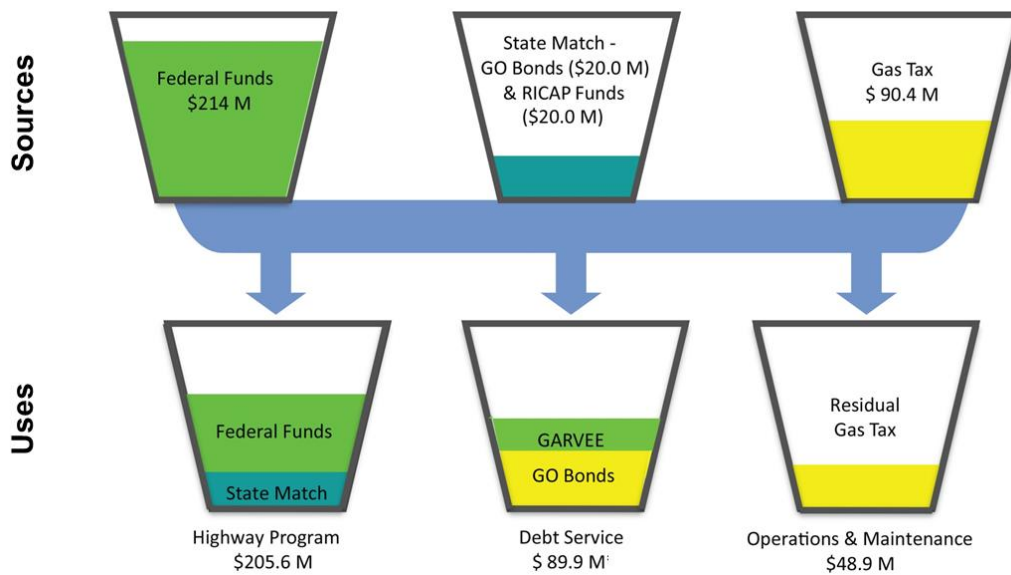
### **Communication: Messages and Methods**

Peer exchange participants discussed developing appropriate messages and using a variety of methods to communicate with policy makers and the public. The importance of crafting messages that resonate with policy makers and the public was noted by participants. Presenting information visually and “telling a story”, rather than just giving facts and figures was also suggested as important by participants. It was suggested that communicating the benefits of asset management for communities, economic development, and quality of life was the important focus of messages, not the details of pavement and bridge deck structure qualities. The message used by the Rhode Island DOT highlighted below was presented as an example during the CEO panel.

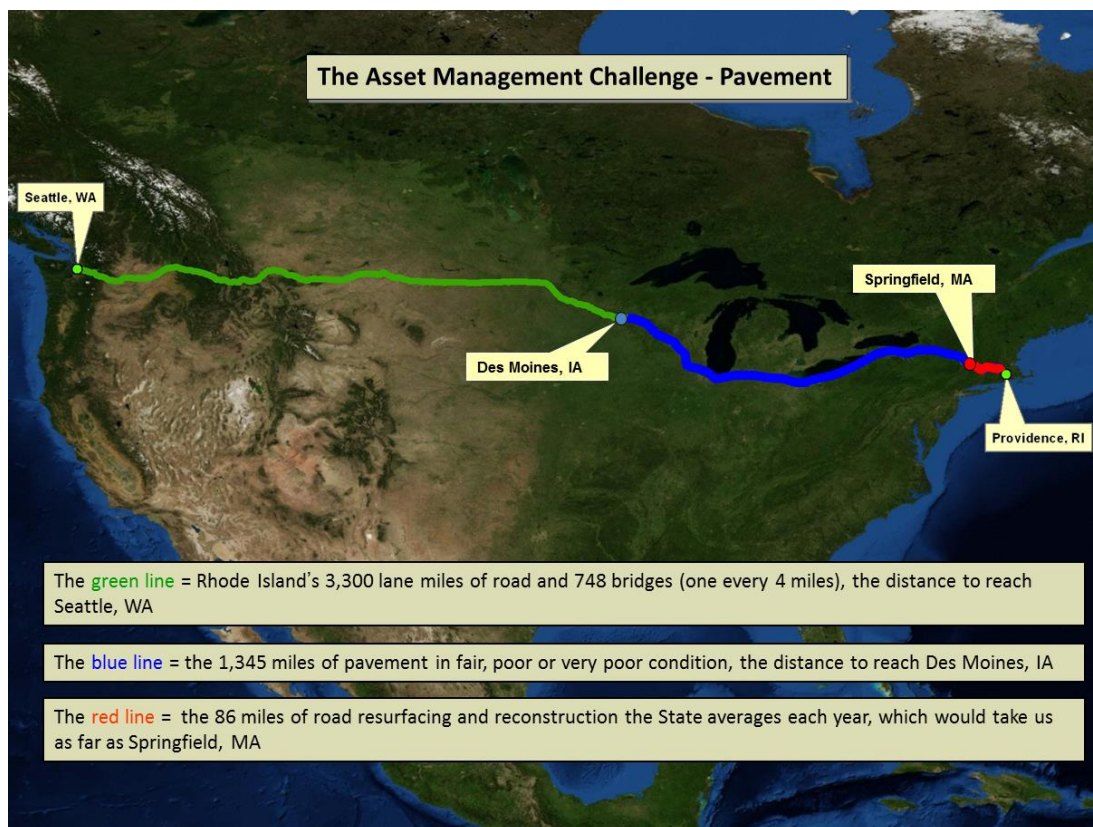
- **Rhode Island DOT Funding and Asset Management Information.** Rhode Island DOT used graphics to help communicate the sources and uses of transportation funding in the state and the asset management challenges facing the department. Targeted toward state legislators, other policy makers, and the public. The graphic presented in [Figure 3](#) was used to begin a dialog on the need for increased funding for transportation in the state. The buckets in the figure highlight the sources of funding for transportation in the state and how those funds are used. The map shown in [Figure 4](#) helps illustrate the shortfall in funds needed to address roadways with fair, poor, and very poor pavements. It compares

- The total miles of the road and bridge system in the state, which stretch to Seattle, Washington;
- The miles of pavement in fair, poor, or very poor condition, which reach Des Moines, Iowa; and
- The annual miles of road resurfacing and reconstructed by Rhode Island DOT with current funding, which reach only to Springfield, Massachusetts.

Peer exchange participants discussed the use of a wide range of methods to communicate with policy makers and the public. Traditional methods noted included summary documents, reports, videos, and websites. Most participants noted that keeping up-to-date information on the agency website was an important part of the overall communication strategy. Some participants



**FIGURE 3 2013 Rhode Island DOT Highway and Bridge Program funding sources and uses.**  
(Source: Rhode Island DOT.)



**FIGURE 4 Rhode Island DOT: presenting pavement management information.**  
(Source: Rhode Island DOT.)

indicated their agencies have embraced the use of social media, including Facebook, Twitter, and other media, while other participants noted they were not able to use these methods. Maintaining regular communication with policy makers through meetings, regular updates to their staff, and frequent summaries was also noted as a key strategy by many participants.

In addition to discussion messages and methods to communicate with public and decision makers, participants also noted the importance of listening to, and obtaining input from the public, user groups, and decision makers. One participant suggested that engaging the public helps a project become their project, not the agency's project. The Minnesota DOT Online Customer Community was highlighted as one innovative approach for obtaining input from the public.

- **Minnesota DOT Online Customer Community.** The Minnesota DOT Online Customer Community, called Minnesota DOT Talk, is a randomly selected market research panel of 450 Minnesota residents who participate in weekly online surveys, discussion and brainstorming sessions, and chats on a range of transportation topics. Members of the Online Customer Community are invited to serve for 1 year. Community members reflect the demographics of the 2010 Census, with a little over half located in the Minneapolis–St. Paul metropolitan area and slightly under half located in greater Minnesota. Questions can be targeted toward subgroups—such as metropolitan area residents or workers who commute during the peak hours—as needed. Information obtained from the Online Customer Community is used by groups throughout the agency, including communications, planning, and operations. The ongoing feedback from the community provides a deeper and richer understanding of transportation needs, preferences, and reactions to proposed and new facilities, services, programs, and policies. Examples of topics considered by the Online Customer Community include active traffic management signs, approaches to improve work zone safety, roundabouts, travel time information during freeway construction, financing and funding alternatives, and financial integrity–accountability.



## Follow-Up Activities

Participants discussed potential follow-up activities to build on and advance the common themes emerging from the peer exchange. As presented in this section, these activities focused on continuing and expanding the dialog among transportation agency CEOs and sharing best practices, developing and using outreach materials targeted toward governors and state legislators, and conducting research on specific topics.

### CONTINUING AND EXPANDING THE DIALOGUE AMONG TRANSPORTATION AGENCY CEOS AND SHARING BEST PRACTICES

Participants indicated that the peer exchange was very beneficial. The opportunity for CEOs to discuss topics of common interest, to share experiences with different approaches, and to interact with each other and with senior agency subject matter experts was noted positively by participants. Peer exchange participants also noted that the format of short presentations by panel members, open discussions, and roundtable dialogs worked well.

Participants suggested convening transportation CEO peer exchanges on a regular basis. Participants voiced both the benefits of the peer exchange and the desire to continue them on a regular basis. Focusing the next peer exchange on transportation and economic development was suggested by participants. Participants noted the need to reach out to additional state departments of transportation and transit agency CEOs. Engaging more CEOs would help ensure that all transportation agencies benefit from the peer exchanges and have the opportunity to share experiences and best practices.

Participants also discussed other methods of sharing information from this peer exchange, as well as ongoing best practices and experiences with different approaches and projects. Organizing sessions at future AASHTO and APTA meetings was suggested, as well as informal interaction at these and other meetings. Continuing to highlight best practices through meetings, conferences, workshops, newsletters, and other methods was also suggested by participants.

### OUTREACH TO GOVERNORS AND STATE LEGISLATORS

Peer exchange participants discussed the importance of communicating with governors and state legislators, as well as city and county officials. It was suggested that a key responsibility of CEOs was knowing the priorities of a governor and where transportation fits into those priorities. Participants further suggested that developing a one- to two-page summary of the important role transportation plays in supporting the economy and providing economic development opportunities would be very beneficial. It could highlight the implications of transportation asset management for communities, states, regions, and the country—in language that resonates with policy makers and the public.

Participants noted that this document could be used in outreach activities with individual governors and legislators, as well as with organizations representing these groups. Examples of groups for possible outreach included the National Governors Association, regional groups such as the Coalition of Northeastern Governors, the National Conference of State Legislatures, the American Legislative Exchange Council, and the Council of State Governments.

## ADDITIONAL RESEARCH

The need for additional research on a number of topics emerged during the panel sessions, the open discussions, and the cross-functional roundtable dialogs. Participants noted that the results from recent research had helped advance the use of asset management at state DOTs and transit agencies. Additional research would further benefit these agencies in communicating with decision makers and the public, developing new asset management data collection and visualization methods, and strengthening the link between transportation and economic development. The following research needs were suggested by peer exchange participants during the discussions.

- Continue documenting best practices in transportation asset management, including the results from the FHWA transportation asset management pilot projects in three states and other activities.
- Examine the role CEO leadership and agency culture change play in developing, implementing, and using asset management at transportation and transit agencies.
- Examine state DOTs that are transitioning to becoming information agencies and document what is being done, how it is being done, and what are the outcomes and benefits. Additionally, explore possible lessons from the private sector with information and data-driven businesses.
- Examine transportation agencies that have developed strategic communication plans, especially those focusing on the benefit of asset management, linking transportation to economic development, and data-driven decision making. Identify the key elements, how the plans were developed, and the benefits of using the plans. Document best practice case studies. Develop a template or outline for a strategic communication plan that could be used by transportation and transit agencies.
- Examine and document effective messages on the value of transportation investments (infrastructure and data), including best practices on collaboration between communications personnel and engineers, planners, and operators. Additionally, examine and document effective techniques, technologies, and methods to transmit these messages.
- Examine and document effective methods to engage community members in dialogs and obtain input on projects, plans, and services, including the use of the Minnesota DOT Online Customer Community.
- Coordinate with other research projects examining the challenges and opportunities associated with sharing, linking, and integrating data from multiple sources. Examine how possible approaches could be used to enhance transportation asset management.
- Coordinate with other research examining new data collection technologies and methods. Examine how evolving technologies and new tools can be applied to enhance asset management and data-driven decision making.
- Examine the link between transportation investments and economic development. Coordinate this effort within the TRB Valuing Transportation Infrastructure Task Force.
- Assess the value of transportation and the return on investments realized from effective investments.
- Build on the supply chain analysis being conducted by the Iowa DOT by undertaking similar studies in other states. Coordinate these efforts with the FHWA Freight Fluidity research activities.

## APPENDIX

### Peer Exchange Attendees

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Andrea Henry  
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Gregory C. Johnson  
Chief Operations Officer  
Michigan DOT

Dick Kane  
Director of Communications  
Florida DOT

Gordon Kennedy  
Manager, Information Resource Management  
Washington State DOT

Timothy R. Lattner  
Director, Office of Maintenance  
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Michael P. Lewis  
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# THE NATIONAL ACADEMIES

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The **National Academy of Engineering** was established in 1964, under the charter of the National Academy of Sciences, as a parallel organization of outstanding engineers. It is autonomous in its administration and in the selection of its members, sharing with the National Academy of Sciences the responsibility for advising the federal government. The National Academy of Engineering also sponsors engineering programs aimed at meeting national needs, encourages education and research, and recognizes the superior achievements of engineers. C. D. (Dan) Mote, Jr., is president of the National Academy of Engineering.

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The **National Research Council** was organized by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the Academy's purposes of furthering knowledge and advising the federal government. Functioning in accordance with general policies determined by the Academy, the Council has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in providing services to the government, the public, and the scientific and engineering communities. The Council is administered jointly by both Academies and the Institute of Medicine. Dr. Ralph J. Cicerone and C. D. (Dan) Mote, Jr., are chair and vice chair, respectively, of the National Research Council.

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