



Transportation for Sustainability An International Conference

May 6–8, 2015

Keck Center of the National Academies
Washington, D.C.

Sponsored by

Federal Highway Administration

UC Davis: National Center for Sustainable Transportation

U.S. Environmental Protection Agency

American Association of State Highway and Transportation Officials:

Center for Environmental Excellence

Parsons Corporation

SCHEDULE AT A GLANCE

	Wednesday, May 6	Thursday, May 7	Friday, May 8				
7:30 a.m.			Continental Breakfast Keck Lobby 7:30 a.m.–8:30 a.m.				
8:00 a.m.							
8:30 a.m.			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> Breakout Session 5: Measuring Sustainability Keck 100 8:30 a.m.–10:00 a.m. </td> <td style="width: 50%; padding: 5px;"> Breakout Session 6: Envisioning Sustainable Transport of the Future Keck 101 8:30 a.m.–10:00 a.m. </td> </tr> </table>	Breakout Session 5: Measuring Sustainability Keck 100 8:30 a.m.–10:00 a.m.	Breakout Session 6: Envisioning Sustainable Transport of the Future Keck 101 8:30 a.m.–10:00 a.m.		
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11:00 a.m.		Plenary Session: Global Initiatives Keck 100 11:00 a.m.–12:30 p.m.					
11:30 a.m.			Lunch Keck Lobby Noon–1:00 p.m.				
Noon	ADD40 Midyear Committee Meeting & Working Lunch Keck 101 Noon–1:30 p.m.	Lunch Keck Lobby 12:30 p.m.–1:45 p.m.					
12:30 p.m.			Closing Session: The Way Forward Keck 100 1:00 p.m.–2:30 p.m.				
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2:00 p.m.	WMATA's Tour	Bike Tour					
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4:00 p.m.		Reception & Student Poster Session Keck Atrium 5:00 p.m.–7:00 p.m.					
4:30 p.m.			Closing Session: The Way Forward Keck 100 1:00 p.m.–2:30 p.m.				
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6:30 p.m.							

May 6–8, 2015



PROGRAM WELCOME

Welcome to “Transportation for Sustainability: An International Conference.” Sustainability has emerged as an overarching concern for the transportation sector around the world. The concept of sustainability recognizes the need to balance our social, environmental, and economic principles in a way that optimizes, rather than compromises, the value of each. A sustainable society not only endures but prospers, and it envisions a world where all inhabitants inherit a decent way of life.

At this conference, we will explore how transportation systems can promote sustainability. You will hear from practitioners representing government, private sector, academia, business, and nonprofit organizations from around the world. The conference will focus on three important themes:

- First, sustainability is an international issue. The increasingly connected world requires that sustainable principles must cross borders and be supported by many nations. Countries across the globe face common problems related to sustainability and transportation, and sharing ideas will help to find sustainable solutions faster. Sustainable transportation can promote growth in developing countries to advance equality in the global economy. Moreover, some challenges—such as climate change—can only be solved by collective international action.
- Second, sustainability must be institutional. Sustainability will only be fully achieved when it is part of the institutions and governments that support and oversee our transportation systems. It must be incorporated into long-term goals and into the short-term decision-making processes of these institutions. It also must be accounted for and measured as their transportation systems grow.
- Finally, sustainability is intergenerational. At its core, sustainability is defined as meeting today’s needs without compromising the ability of future generations to meet their needs (Brundtland Commission Report, 1987). Future generations must be engaged in the dialogue about sustainability—to learn from experience and also to open the way to new approaches. To this end, we are very excited to showcase our student poster session on transportation and sustainability and to engage students from around the world in this conference.

The goal of this conference is not just to talk, but to listen. We encourage you to share your questions and ideas throughout, and especially at the roundtable discussions at the end. If you are participating virtually, we ask you to engage remotely through your questions and comments, as you will play an important role in broadening the scope of our ideas and perspectives.

We hope that the dialogue that begins at this conference will not end here—that the conference will foster new ideas, new partnerships, new practices, and new resolve to promote transportation for sustainability. We look forward to an exciting and thought-provoking conversation during these next three days.

—April Marchese, Federal Highway Administration
Josias Zietsman, Texas A&M Transportation Institute

Conference Organizing Committee

April Marchese, Federal Highway Administration, *Chair*
Rich Baldauf, U.S. Environmental Protection Agency
Giovanni Circella, University of California, Davis
Biagio Ciuffo, European Commission, Joint
Research Centre, Sustainable Transport, Italy
Josh DeFlorio, Cambridge Systematics
George Dondero, Santa Cruz County Regional
Transportation Commission
Shannon Eggleston, American Association of State Highway and
Transportation Officials
Damon Fordham, Cadmus Group
Lew Fulton, University of California, Davis
Henrik Gudmundsson, Technical University of Denmark
Ralph Hall, Virginia Polytechnic Institute
Rachel Healy, Washington Metropolitan Area Transit Authority
Tina Hodges, Federal Highway Administration

Kristine Malnaca, Consultant
Elisabeth Lennon, New York State Department of Transportation
Petra Mollet, American Public Transportation Association
Jenny O’Connell, American Association of State Highway and
Transportation Officials Administration
Antoinette Quagliata, Federal Highway Administration
Tara Ramani, Texas A&M Transportation Institute
Seth Stark, Washington Department of Transportation
Tim Sexton, Minnesota Department of Transportation
Yanzhi Ann Xu, Georgia Institute of Technology
Jiangping Zhou, Iowa State University
Joe Zietsman, Texas A&M Transportation Institute

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May 6–8, 2015



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STUDENT POSTERS

Accessibility Planning in American Metropolitan Areas: Are We There Yet?

David Proffitt, University of Utah

Addressing Sustainability in the Assessment of Large-Scale Transportation Projects

Christina Georgouli, Technical University of Denmark

Air Travel and the Environment: An Ecological and Social Perspective

Lauren Simcic, Texas A&M University, College Station

A Web-Based Tool for Estimating Monetary Values from Carbon Emission Savings in Pavement

Xiaoyu Liu, University of Maryland

Real-Time Traffic Information to Real-Time Emissions: An Application of International Environmental Database (IED)

Xiaofan Yang, Tsinghua University, Beijing

Fuel Consumption Estimation Based on Smartphone Low-Energy Sensors

Ilyas Ustun, Old Dominion University

Identifying Barriers to Promoting Sustainable Modes of Transportation: Examining Cyclists' vs. Noncyclists' Attitudes Toward Bicycling

Chelsea Thomas, Dori Sanders, and Sharon Thompson, Coastal Carolina University

Increasing Sustainability through Provision of Cycling Facilities: A Case Study in Albuquerque, New Mexico

Mohammad Tayarani, University of New Mexico

MOSAIC: Model of Sustainability and Integrated Corridors—A Comprehensive Tool for Multimodal Sustainable Corridor Planning

Liang Tang, University of Maryland, College Park

Multimodal Trip Generation to Support Community Connections

Kelsey Lineburg, James Madison University

Operationalising Strong Sustainability Concepts in the Assessment of the New Frederikssund Connection Using MCDA and AHP

Shaun Bortei-Doku, Mette Berner Dyrberg, Marie Ridley Pryn, and Yannick Cornet, Technical University of Denmark

Resilience of Multimodal Transportation Infrastructure Systems

Lizzie Engel, University of Virginia

Social Equity Issue in Walkable Neighborhoods: Exploring the Relationship Between Walk Score and Sociodemographic Factors

Jinuk Hwang, Texas A&M University

The Social Sustainability of Bike Share: Transportation Inequality and Access for Low-Income Communities

Sara Maurer, Stanford University

Surface Transportation Sustainability Indices vs. Macroeconomics and Social Conditions in the United States and Selected European Countries

Hamed Ahangari, Carol Atkinson-Palombo, and Norman W. Garrick, University of Connecticut

Sustainability Assessment under Multi-Attribute Uncertainty for Alternative Fuel Vehicles and Driverless Cars

Liang Shi, University of Hawaii

TRANSPORTATION RESEARCH BOARD

OF THE NATIONAL ACADEMIES

Transportation Research Board is one of six major divisions of the National Research Council, which serves as an independent adviser to the federal government and others on scientific and technical questions of national importance. The National Research Council is jointly administered by the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The mission of the Transportation Research Board is to provide leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal. The Board's varied activities annually engage about 7,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation.
www.TRB.org

May 6–8, 2015



PRECONFERENCE ACTIVITIES

(Optional, Registration Required)

Wednesday, May 6

Noon–1:30 p.m., Keck 101

Committee Meeting: ADD40 Midyear Committee Meeting and Working Lunch

(Open to committee members and to all conference attendees)

2:00 p.m.–4:30 p.m.

Washington Area Metropolitan Transit Authority (WMATA) Tour

Start location: Metro Center at F and 12th Streets. Meet at street level near the escalators. Look for the TRB Sustainability Conference Sign.

Take a trip out Metro's new Silver Line and learn about the key role transit infrastructure plays in regional sustainability efforts. Hear from Metro's Manager of Sustainability, Rachel Healy, about regional efforts to identify strategies and to set and reach regional greenhouse gas targets in an area that spans the states of Virginia, Maryland, and the District of Columbia.

Hear also from Metro's Manager of Long Range Planning, Alison Davis, about ConnectGreaterWashington: The Regional Transit System Plan for 2040. The plan seeks to reduce congestion, improve connections, promote regional transit trips, support economic growth, and meet the travel needs of a growing region. These initiatives build on RegionForward, a regional strategic plan for a prosperous and sustainable future.



Greensboro Metro Station on the Silver Line in Northern Virginia. (Photo: Ryan Stavelly)

2:00 p.m.–4:00 p.m.

Bicycle Tour

Tour administered by Bike and Roll

Start location: Union Station, 50 Massachusetts Avenue NE, Washington, D.C. 20002

Cost of bike rental: \$24, to be paid by the rider at the beginning of the tour

Participation limited to 25 cyclists. All participants are required to sign a waiver and wear a helmet while on their bicycle; additionally, no ear buds are to be worn while riding.

Enjoy a 5-mile bike ride to learn about multimodal transportation planning and design! This 2-hour-long bike tour will take you to visit many standard and innovative bicycle facilities in the District of Columbia—including protected bike lanes, the Mount Vernon multiuse trail, and Capital Bikeshare. On the tour, you also will encounter such D.C. landmarks as the White House. The tour will be led by local expert Charlie Denney, Senior Associate at Alta Planning and Design.

The Bikestation at Union Station is located on 1st St NE, just to the west of Union Station. When coming from inside the Union Station Grand Hall, turn right upon exiting and walk toward the western side of the building. From the Metro, exit toward the shops, turn left at the top of the escalators, and walk through the stone arches to the Bikestation.

Wednesday, May 6, 2015



CONFERENCE SESSIONS

Thursday, May 7

8:30 a.m.–4:00 p.m., Keck 100 Lobby

Registration

8:30 a.m.–9:30 a.m., Keck 100 Lobby

Breakfast

9:30 a.m.–10:30 a.m., Keck 100

Opening Session: Setting the Stage

April Marchese, Director, Office of Natural Environment, Federal Highway Administration (FHWA), *presiding*

Welcome Address

Neil Pedersen, Executive Director, Transportation Research Board

Joe Zietsman, Environment and Air Quality Division Head, Texas A&M Transportation Institute (TTI)

Keynote Talks to Set the Stage

Dan Sperling, Distinguished Professor and Founding Director, Institute of Transportation Studies, University of California (UC), Davis

10:30 a.m.–11:00 a.m.

Break

11:00 a.m.–12:30 p.m., Keck 100

Plenary Session: Global Initiatives

Henrik Gudmundsson, *presiding*

A session to discuss sustainability and sustainable transportation in the context of global initiatives and also to provide the perspective of developed as well as developing nations.

Holger Dalkmann, Director, Strategy and Global Policy, EMBARQ Director, WRI Ross Center for Sustainable Cities

Jose Luis Irigoyen, Director, Transport and ICT Global Practice, World Bank

Shoshana Lew, Deputy Assistant Secretary for Transportation Policy, U.S. Department of Transportation (DOT)

12:30 p.m.–1:45 p.m., Keck 100 Lobby

Lunch

1:45 p.m.–3:15 p.m.

Breakout Sessions

Breakout 1: Assessing Solutions for Common Sustainability Problems, Keck 100

Jenny O'Connell, American Association of State Highway and Transportation Officials, *presiding*

Many countries have common issues related to sustainability and transportation. This session will showcase state-of-the-art solutions applied in the United States and other countries and methods for assessing the performance of these solutions. Hear examples of how bus rapid transit (BRT), affordable housing, climate mitigation, and urban development strategies are improving sustainability in three continents. Discuss with researchers and practitioners how these solutions may be applicable elsewhere and how to assess their performance.

Thursday, May 7, 2015



- Social, Environmental, and Economic Benefits of Bus Rapid Transit: Case Studies from Colombia, Mexico, South Africa, and Turkey
Juan Velasquez, EMBARQ
- Developing an Assessment Model for Site Selection of Affordable Housing Communities in Rail Transit Corridor of Kaohsiung, Taiwan
Kang-Li Wu, Harbin Institute of Technology
- Evaluation of MTC's Climate Initiatives Program
Stephanie Hom and Ursula Vogler, Metropolitan Transportation Commission (MTC), and Jeffrey Ang-Olsen, ICF International
- Low-Emission Urban Development: A Critical Analysis of Residential Neighborhoods in Delhi, India
Amit Arora, School of Planning and Architecture, New Delhi

Breakout 2: Institutionalizing Sustainable Practices Globally, Keck 101

Arturo Ardila-Gomez, World Bank, *presiding*

This session will introduce and discuss recent developments in governance frameworks for sustainable transportation investments and decision making at different levels around the world. How are transportation agencies across the world institutionalizing and mainstreaming sustainability into their practices? Hear from Denmark, Namibia, the United States, and Latin America.

- Denmark's SUSTAIN Project: Creative Group Decision Making for Sustainable Transport Development
Henrik Gudmundsson, Technical University of Denmark
- Developing a National Transportation Sustainability Plan for Namibia
Palesa Hekandjo, Roads Authority of Namibia
- Sustainability as an Organizing Principle for Transportation Agencies
Gary McVoy, McVoy Associates
- The Inter-American Development Bank's Sustainable Infrastructure Framework and Transport Applications in Latin America
Graham Watkins, Inter-American Development Bank

3:15 p.m.–3:30 p.m.

Break

3:30 p.m.–5:00 p.m.

Breakout Sessions

Breakout 3: International Trade and Travel—Striving for Sustainability, Keck 100

Tara Ramani, TTI, *presiding*

How can we make the growing flows of international trade and travel more sustainable? Today's supply chains rely on complex, multimodal transportation systems that cross international borders. While some modes are able to switch to low-carbon fuels, options are more limited for international air travel. This session will discuss methods to standardize greenhouse gas emission accounting for global transportation chains, the map sustainability of trade corridors, and will compare and promote sustainable aviation practices.

- Sustainable Aviation Guidance Alliance: An Interactive Website to Share Sustainability Best Practices
Kristin Lemaster, Changing Climate Consulting
- The Policy Effectiveness of Economic Incentives in the Air Transportation Sector: The Comparative Analysis of Offset Programs, Emission Tax, and Emission Trade
Joel Zhengyi Shon, Tainan University of Technology
- SUPERGREEN: Mapping Sustainability and Emissions of Trans-European Trade Corridors
George Panagakos, Technical University of Denmark



Breakout 4: Sustainable Transportation and Climate Change, Keck 101
Rich Baldauf, U.S. Environmental Protection Agency, *presiding*

Climate Change is inherently an international issue: greenhouse gas emissions anywhere contribute to changes in climate everywhere. This session starts with a presentation on one way in which emissions can affect climate, particularly the impacts of black carbon on arctic snowmelt. Then hear about efforts to measure and reduce greenhouse gas emissions in Germany, the United States, and China. Finally, learn about climate impacts on the transportation system and how one transportation agency is responding in order to increase resilience to flooding and extreme heat events induced by climate change.

- Potential for Diesel Black Carbon from the United States and Eurasia to Impact Arctic Snowmelt
Jennifer DeWinter, Sonoma Technology
- Daily Travel and CO₂ Emissions from Passenger Transport: A Comparison of Germany and the United States
Ralph Buehler and Kyle Lukacs, Virginia Polytechnic Institute
- Assessing Household Travel Energy Consumption and Carbon Emissions Based on Urban Form: A Case of Jinan, China
Yang Jiang, Sustainable Transportation Center, Tsinghua University
- Sustainability of DOT Assets to Climate Change Effects
Robert Chamberlin, RSG, Inc.

5:00 p.m.–7:00 p.m., Keck Atrium

Reception and Student Poster Session

Friday, May 8

7:30 a.m.–11:00 a.m., Keck 100 Lobby

Registration

7:30 a.m.–8:30 a.m., Keck 100 Lobby

Breakfast

8:30 a.m.–10:00 a.m.

Breakout Sessions

Breakout Session 5: Measuring Sustainability, Keck 100
Giovanni Circella, UC Davis, *presiding*

Transportation agencies strive to provide strong economic, social, and environmental outcomes to the communities they serve. Many in the United States and abroad are now using tools such as INVEST and CEEQUAL to evaluate projects and programs and to monitor improvements in transportation sustainability. This session will present different experiences using INVEST from Texas DOT and Paraguay's Ministry of Public Works and using the CEEQUAL tool in the United Kingdom. The most relevant data needs associated with sustainable transportation performance measurement also will be discussed.

- U.S. and International Experience with the INVEST Sustainability Tool
Frank Holzmann, Texas DOT, Daniel González Sosa, and **Guillermo González Lopez**, Ministry of Communications and Public Works, Paraguay
- The United Kingdom's CEEQUAL Sustainability Tool in Action
Roger Venables, CEEQUAL
- Sustainable Transportation Performance Evaluation Data Needs
Todd Litman, Victoria Transportation Institute

Thursday, May 7, and Friday, May 8, 2015



Breakout Session 6: Envisioning Sustainable Transport of the Future, Keck 101

Antoinette Quagliata, Federal Transit Administration, *presiding*

What will the transportation sector look like in the future? How will emerging technologies, autonomous vehicles, and new mobility systems change future transportation scenarios and reshape cities? How can we steer this future in a sustainable direction?

- The Role of Zero-Emission Vehicle Mandates in the Transition to Sustainable Energy for Motor Vehicles
David Greene, University of Tennessee
- Urban Mobility: Systems Upgrade Project
Philippe Crist, Organisation for Economic Co-operation and Development
- Connected and Autonomous Vehicles of the Future
Brian Cronin, Federal Highway Administration

10:00 a.m.–10:15 a.m.

Break

10:15 a.m.–Noon

Working Group Discussions

Join your colleagues in animated discussion about key sustainability topics. Each discussion group will develop:

- **Key Findings from the Conference:** How did the presentations on this topic relate? What did we learn? What are the similarities and differences in the sustainability approaches of different countries? What can different countries learn from one another?
- **Research Needs:** Participants will discuss research needs for their topic area based on information gleaned through the conference and ideas sparked by the previous two days.

Group A

Developing Countries: Challenges on the Path to Sustainability, Keck 100

Ralph Hall, Virginia Polytechnic Institute, *presiding*

Group B

Practitioner's Guidance on Implementing Sustainability, Keck 101

Steven Olmsted, Arizona DOT, and Tim Sexton, Minnesota DOT, *presiding*

Group C

Factors Affecting Demand for Transportation and Impact on Sustainability, Keck 105

Giovanni Circella, UC Davis, *presiding*

Group D

Roundtable: Role of Government Policies vs. Private Initiatives in Leading the Future, Keck 106

April Marchese, FHWA, and Damon Fordham, Cadmus Group, *presiding*

Noon–1:00 p.m., Keck 100 Lobby

Lunch

1:00 p.m.–2:30 p.m., Keck 100

Closing Plenary Session: The Way Forward

April Marchese, FHWA, *presiding*

In the closing plenary, speakers will draw linkages between ideas brought forward during the conference, sketch overarching themes, and suggest ways in which researchers and practitioners can move forward sustainable transportation goals. Speakers will also present a summary of the key findings and research needs developed by the four working group sessions during the day. The Conference Organizing Committee for the conference will present an award to the winner of the best student poster.

Joe Zietsman, TTI

Ralph Hall, Virginia Polytechnic Institute



SAVE THE DATE



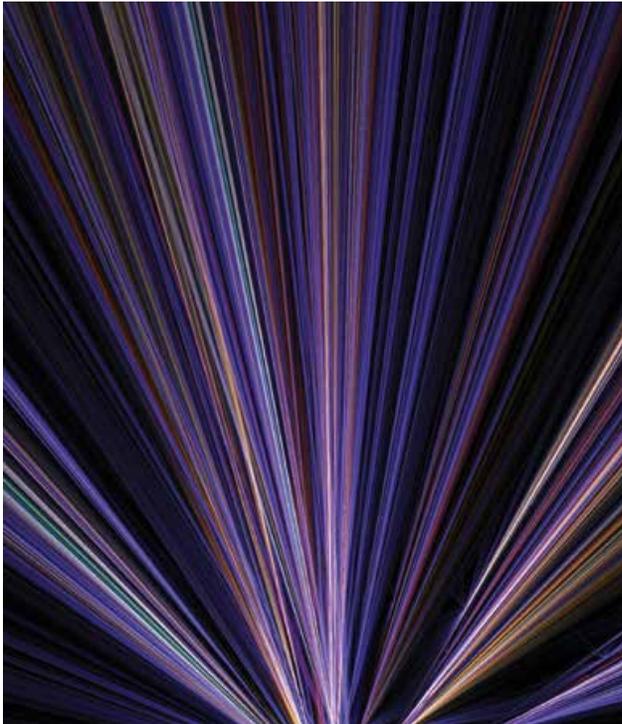
First International Conference on Surface Transportation System Resilience to Climate Change and Extreme Weather Events

September 16–18, 2015

National Academies of Science Building
Washington, D.C.

Early Bird Registration Rate Expires July 10!

TRB



Transportation Research Board 2016 Annual Meeting

Join more than **12,000 transportation professionals** at the TRB 95th Annual Meeting, January 10–14, 2016, in Washington, D.C.

The program will cover *all* transportation modes, with more than 5,000 presentations in nearly 750 sessions, addressing topics of interest to policy makers, administrators, practitioners, researchers, and representatives of government, industry, and academic institutions.

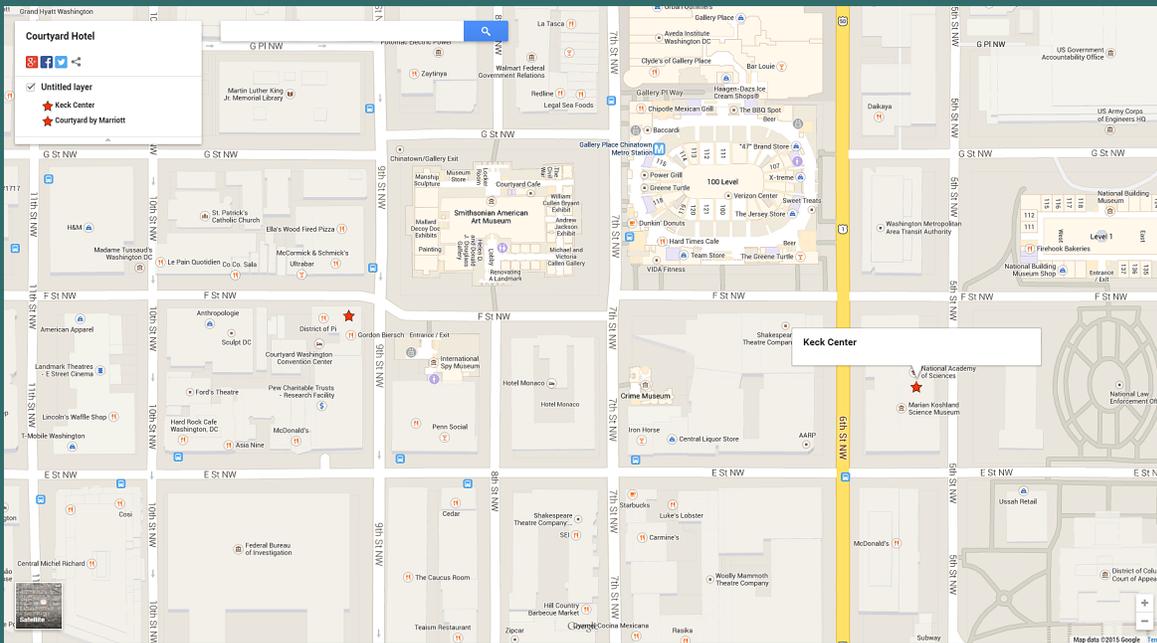
Also, many sessions and workshops will focus on the spotlight theme for the 2016 meeting, *“Research Convergence for a Multimodal Future.”* The full program will be available online in November 2015.

Plan now to attend. For more information, visit www.trb.org/AnnualMeeting.

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Area Map

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