

NOVEMBER–DECEMBER 2014  
NUMBER 295

TRANSPORTATION RESEARCH BOARD  
OF THE NATIONAL ACADEMIES

# TR NEWS

## Turning Points

- Research Executives Making History
- Commercial Aviation's New Century
- India's Highway Capacity Manual
- Roundabouts Gaining Momentum
- Imaging Revolution Hits the Streets
- Managing Traffic on the Move
- Smart Growth Accommodating Freight



## THE NATIONAL ACADEMIES

*Advisers to the Nation on Science, Engineering, and Medicine*

### National Academy of Sciences National Academy of Engineering Institute of Medicine National Research Council

The **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, and which 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.

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.

**www.TRB.org**



## TRANSPORTATION RESEARCH BOARD 2014 EXECUTIVE COMMITTEE\*

**Chair:** Kirk T. Steudle, Director, Michigan Department of Transportation, Lansing  
**Vice Chair:** Daniel Sperling, Professor of Civil Engineering and Environmental Science and Policy; Director, Institute of Transportation Studies, University of California, Davis  
**Executive Director:** Robert E. Skinner, Jr., Transportation Research Board  
**Victoria A. Arroyo**, Executive Director, Georgetown Climate Center, and Visiting Professor, Georgetown University Law Center, Washington, D.C.  
**Scott E. Bennett**, Director, Arkansas State Highway and Transportation Department, Little Rock  
**Deborah H. Butler**, Executive Vice President, Planning, and CIO, Norfolk Southern Corporation, Norfolk, Virginia (Past Chair, 2013)  
**James M. Crites**, Executive Vice President of Operations, Dallas–Fort Worth International Airport, Texas  
**Malcolm Dougherty**, Director, California Department of Transportation, Sacramento  
**A. Stewart Fotheringham**, Professor and Director, Centre for Geoinformatics, School of Geography and Geosciences, University of St. Andrews, Fife, United Kingdom  
**John S. Halikowski**, Director, Arizona Department of Transportation, Phoenix  
**Michael W. Hancock**, Secretary, Kentucky Transportation Cabinet, Frankfort  
**Susan Hanson**, Distinguished University Professor Emerita, School of Geography, Clark University, Worcester, Massachusetts  
**Steve Heminger**, Executive Director, Metropolitan Transportation Commission, Oakland, California  
**Chris T. Hendrickson**, Duquesne Light Professor of Engineering, Carnegie Mellon University, Pittsburgh, Pennsylvania  
**Jeffrey D. Holt**, Managing Director, Bank of Montreal Capital Markets, and Chairman, Utah Transportation Commission, Huntsville, Utah  
**Gary P. LaGrange**, President and CEO, Port of New Orleans, Louisiana  
**Michael P. Lewis**, Director, Rhode Island Department of Transportation, Providence  
**Joan McDonald**, Commissioner, New York State Department of Transportation, Albany  
**Abbas Mohaddes**, President and CEO, Iteris, Inc., Santa Ana, California  
**Donald A. Osterberg**, Senior Vice President, Safety and Security, Schneider National, Inc., Green Bay, Wisconsin  
**Steven W. Palmer**, Vice President of Transportation, Lowe's Companies, Inc., Mooresville, North Carolina  
**Sandra Rosenbloom**, Professor, University of Texas, Austin (Past Chair, 2012)  
**Henry G. (Gerry) Schwartz, Jr.**, Chairman (retired), Jacobs/Sverdrup Civil, Inc., St. Louis, Missouri  
**Kumares C. Sinha**, Olson Distinguished Professor of Civil Engineering, Purdue University, West Lafayette, Indiana  
**Gary C. Thomas**, President and Executive Director, Dallas Area Rapid Transit, Dallas, Texas  
**Paul Trombino III**, Director, Iowa Department of Transportation, Ames  
**Phillip A. Washington**, General Manager, Regional Transportation District, Denver, Colorado

**Thomas P. Bostick** (Lt. General, U.S. Army), Chief of Engineers and Commanding General, U.S. Army Corps of Engineers, Washington, D.C. (ex officio)  
**Timothy P. Butters**, Acting Administrator, Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation (ex officio)  
**Alison Jane Conway**, Assistant Professor, Department of Civil Engineering, City College of New York, New York, and Chair, TRB Young Members Council (ex officio)  
**T. F. Scott Darling III**, Acting Administrator and Chief Counsel, Federal Motor Carrier Safety Administration, U.S. Department of Transportation (ex officio)  
**David J. Friedman**, Acting Administrator, National Highway Traffic Safety Administration, U.S. Department of Transportation (ex officio)  
**LeRoy Gishi**, Chief, Division of Transportation, Bureau of Indian Affairs, U.S. Department of the Interior, Washington, D.C. (ex officio)  
**John T. Gray II**, Senior Vice President, Policy and Economics, Association of American Railroads, Washington, D.C. (ex officio)  
**Michael P. Huerta**, Administrator, Federal Aviation Administration, U.S. Department of Transportation (ex officio)  
**Paul N. Jaenichen, Sr.**, Acting Administrator, Maritime Administration, U.S. Department of Transportation (ex officio)  
**Therese W. McMillan**, Acting Administrator, Federal Transit Administration, U.S. Department of Transportation (ex officio)  
**Michael P. Melaniphy**, President and CEO, American Public Transportation Association, Washington, D.C. (ex officio)  
**Gregory G. Nadeau**, Acting Administrator, Federal Highway Administration, U.S. Department of Transportation (ex officio)  
**Peter M. Rogoff**, Under Secretary for Policy, U.S. Department of Transportation (ex officio)  
**Craig A. Rutland**, U.S. Air Force Pavement Engineer, Air Force Civil Engineer Center, Tyndall Air Force Base, Florida (ex officio)  
**Joseph C. Szabo**, Administrator, Federal Railroad Administration, U.S. Department of Transportation (ex officio)  
**Barry R. Wallerstein**, Executive Officer, South Coast Air Quality Management District, Diamond Bar, California (ex officio)  
**Gregory D. Winfree**, Assistant Secretary for Research and Technology, Office of the Secretary, U.S. Department of Transportation (ex officio)  
**Frederick G. (Bud) Wright**, Executive Director, American Association of State Highway and Transportation Officials, Washington, D.C. (ex officio)  
**Paul F. Zukunft** (Adm., U.S. Coast Guard), Commandant, U.S. Coast Guard, U.S. Department of Homeland Security (ex officio)

\* Membership as of December 2014.

# TR NEWS

NUMBER 295

NOVEMBER–DECEMBER 2014

## 3 Caretakers and Change Makers:

### The Nine Leaders Who Built the Transportation Research Board

*Suzanne B. Schneider*

The advent of TRB's tenth Executive Director in February 2015 offers an occasion to review the history of the nine men who led the Board from its beginnings in 1920 to the present. Engineers all, they have served as spokesmen and champions for what transportation research can accomplish and have facilitated the dialogue, coordination, fundraising, study, and dissemination needed for the research enterprise to thrive.

## 13 Pedersen Named TRB Executive Director

## 14 Commercial Aviation Soars into Its Second Century:

### Aerial Views of a Rapidly Developing History—and Outlook

*John Fischer, Greg Casto, and George Hamlin*

Commercial aviation reached its 100th anniversary in 2014. The authors present a chronological fly-by of the historic highlights and assemble insights from eyewitnesses.

## 17 Indo-HCM—India's Highway Capacity Manual Project:

### Developing a National Guide to Address Unique Traffic Conditions

*Kayitha Ravinder, Senathipathi Velmurugan, and Subhamay Gangopadhyay*

A five-year national study is under way to develop the Indo-HCM, a Highway Capacity Manual addressing the unique characteristics of traffic, roadways, terrain, and driver behavior in India. The authors describe the collaborative research undertaking, the component work packages, the coordinated progress, and the expected products.

## 23 NCHRP REPORTS AND PROJECTS

### Implementing Modern Roundabouts in the United States

*Hillary Isebrands*

The United States has joined many other countries in the widespread implementation of roundabouts as an intersection alternative that offers significant safety and operational benefits. The author traces recent and ongoing efforts to develop and provide guidance and technical assistance to encourage the consideration and implementation of roundabouts.

## 26 NCHRP SYNTHESIS

### Active Traffic Management Strategies for Arterials

*Richard G. Dowling and Aaron Elias*

Active traffic management is the timely adaptation of a roadway facility's configuration and controls to maintain optimal productivity in response to—or in anticipation of—variations in demand, incidents, and weather. A recent synthesis project provides an overview of the state of the practice.

## 31 NCHRP SYNTHESIS AND NCHRP REPORT

### Adopting Geospatial Technologies:

#### Key to the Digital 3-D Revolution in Transportation

*Gene V. Roe, Michael J. Olsen, and John D. Raugust*

Responding to the rapid technological changes in the geospatial industry, the National Cooperative Highway Research Program has published a synthesis report summarizing the use of advanced geospatial data, tools, and technologies by state agencies and a report offering guidance on the use of mobile LiDAR, a key 3-D geospatial tool.

## 34 NCFRP REPORT

### Smart Growth and Urban Goods Movement

*Edward McCormack, Anne Goodchild, and Alon Bassok*

Planning for smart growth, which emphasizes compact development, mixed land use, and nonautomobile modes of travel, has often ignored the role of goods movement. A new National Cooperative Freight Research Program report explores the implications of the smart growth–goods movement relationship for transportation modeling and freight planning.



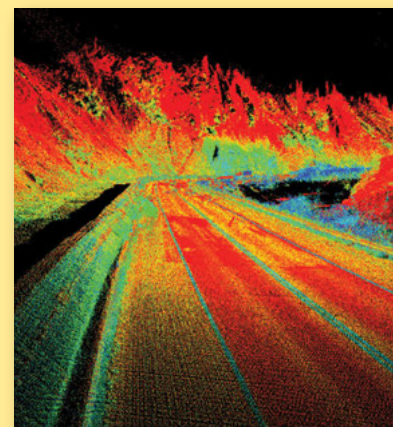
3



14



17



COVER: Point cloud from a LiDAR scan image of a roadway and terrain in Denali National Park, Alaska. Imaging technologies are revolutionizing many areas of transportation practice; articles in this issue highlight several other historic turning points for transportation research and practice. (Image: Alaska Department of Transportation and Public Facilities)

# TR NEWS

features articles on innovative and timely research and development activities in all modes of transportation. Brief news items of interest to the transportation community are also included, along with profiles of transportation professionals, meeting announcements, summaries of new publications, and news of Transportation Research Board activities.

## **TR News is produced by the Transportation Research Board Publications Office**

Javy Awan, Editor and Publications Director  
Lea Camarda, Associate Editor  
Jennifer J. Weeks, Photo Researcher  
Juanita Green, Production Manager  
Michelle Wandres, Graphic Designer

## **TR News Editorial Board**

Frederick D. Hejl, Chairman  
Christine L. Gerencher  
Edward T. Harrigan  
Christopher J. Hedges  
Russell W. Houston  
Katherine Kortum  
Thomas R. Menzies, Jr.  
G.P. Jayaprakash, Research Pays Off Liaison

## **Transportation Research Board**

Robert E. Skinner, Jr., Executive Director  
Russell W. Houston, Assistant Executive Director  
Mark R. Norman, Director,  
Technical Activities  
Stephen R. Godwin, Director,  
Studies and Special Programs  
Gary J. Walker, Director,  
Administration and Finance  
Christopher W. Jenks, Director,  
Cooperative Research Programs  
Ann M. Brach, Director, SHRP 2

*TR News* (ISSN 0738-6826) is issued bimonthly by the Transportation Research Board, National Research Council, 500 Fifth Street, NW, Washington, DC 20001. Internet address: [www.TRB.org](http://www.TRB.org).

**Editorial Correspondence:** By mail to the Publications Office, Transportation Research Board, 500 Fifth Street, NW, Washington, DC 20001, by telephone 202-334-2972, by fax 202-334-3495, or by e-mail [jawan@nas.edu](mailto:jawan@nas.edu).

**Subscriptions:** North America: 1 year \$60; single issue \$12. Overseas: 1 year \$85; single issue \$12 plus shipping. Inquiries or communications concerning new subscriptions, subscription problems, or single-copy sales should be addressed to the Business Office at the address below, or telephone 202-334-3216, fax 202-334-2519. Periodicals postage paid at Washington, D.C.

**Postmaster:** Send changes of address to *TR News*, Transportation Research Board, 500 Fifth Street, NW, Washington, DC 20001.

**Notice:** The opinions expressed in articles appearing in *TR News* are those of the authors and do not necessarily reflect the views of the Transportation Research Board. The Transportation Research Board and *TR News* do not endorse products or manufacturers. Trade and manufacturers' names appear in an article only because they are considered essential.

Printed in the United States of America.

Copyright © 2014 National Academy of Sciences. All rights reserved. For permissions, contact TRB.

The *Transportation Research Board 2014 Annual Report* is included in this issue as a special insert, between pages 24 and 25.

## ALSO IN THIS ISSUE:

### 39 Research Pays Off

Second-Generation, Full-Depth, Precast Concrete Deck System: Nebraska Department of Roads Applies NUDECK to Improve Constructability and Cost-Effectiveness

*Fouad Jaber*

### 42 Profiles

Aviation economist and business college dean Gerald MacDougall

### 44 TRB Highlights

Cooperative Research Programs News, 44

### 45 Bookshelf

### 48 Calendar



39

## COMING NEXT ISSUE



Amphibious excavator constructing a pilot channel to increase flow through the debris dam after the March 22, 2014, landslide—the deadliest in U.S. history—near Oso in northwestern Washington State.

With the Panama Canal celebrating its centennial in 2014 and scheduled to open new locks in 2016, a feature article in the next issue looks at the legacy and future of the canal and the probable effects the expansion will have on U.S. harbor infrastructure and supply chains. Also featured is a report on the 2014 state partnership visits by TRB senior program officers, highlighting research needs and applications, particularly model efforts by state agencies to leverage new technology. Other features describe Louisiana's strategy to "right-size" the state highway system, working with local governments; the response to the deadly Oso mudslide in March 2014 on Washington State Route 530, including recovery efforts and preventive measures; the effects of sustainability practices on airport operations and maintenance; and improving transportation options for veterans, military service members, and their families.



# Caretakers and Change Makers

*The Nine Leaders Who Built the Transportation Research Board*

SUZANNE B. SCHNEIDER



*The author retired as Associate Executive Director of TRB in September 2013 after 27 years in the Executive Office, guiding program oversight activities, report review, publications, and communications. She worked closely with the Board's eighth and ninth Executive Directors.*

If you have ever visited the offices of the Transportation Research Board (TRB) in the National Academies' Keck Center in Washington, D.C., you may recall seeing row upon row of photographs of the Board's Executive Committee Chairs—78 individuals who have served in that role from 1920 to 2014. On a wall around the corner from the Executive Committee Chair gallery is a smaller group of portraits—eight of the nine men who have served as the Board's Executive Directors since its founding 94 years ago.