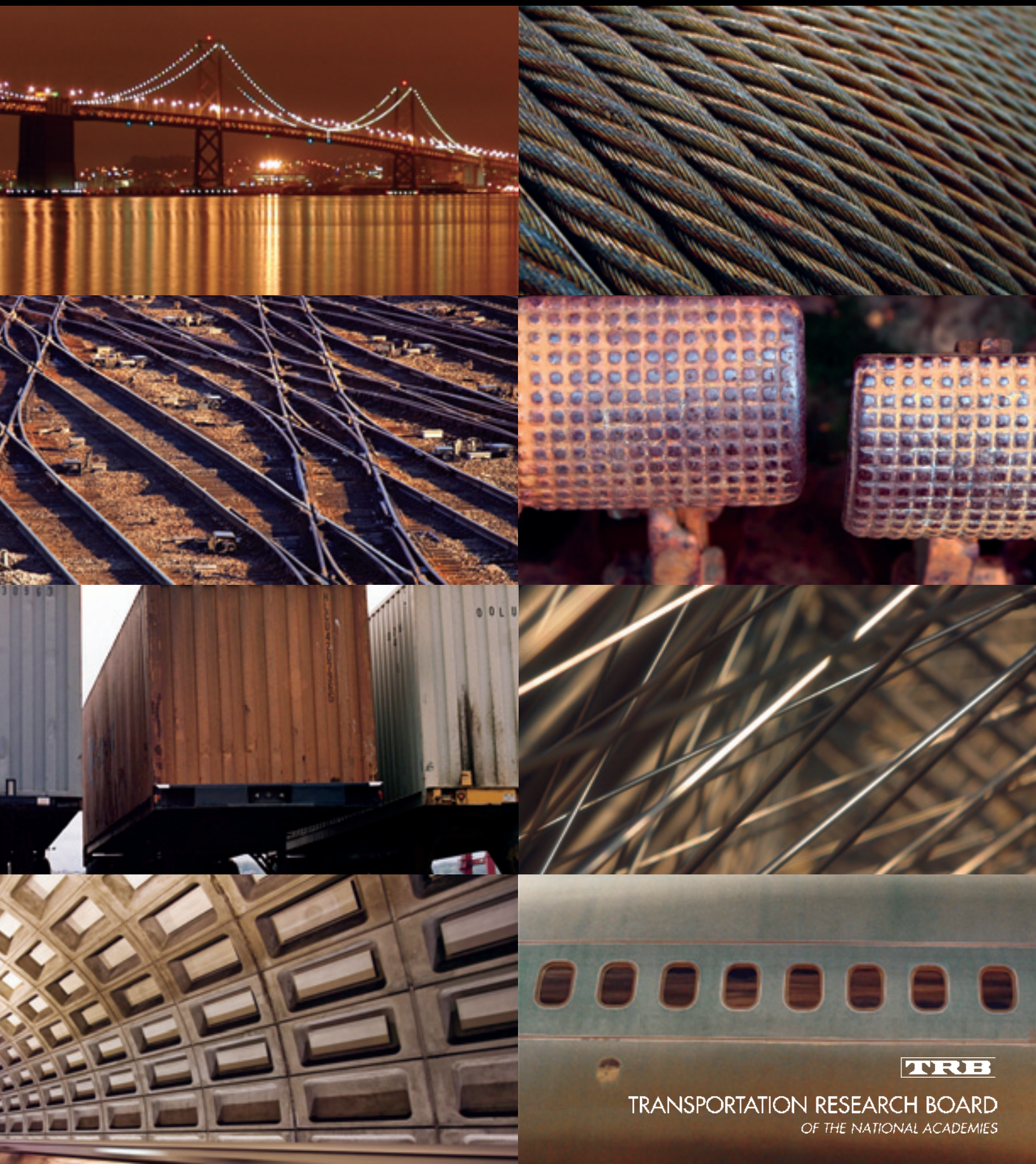
TRANSPORTATION RESEARCH BOARD

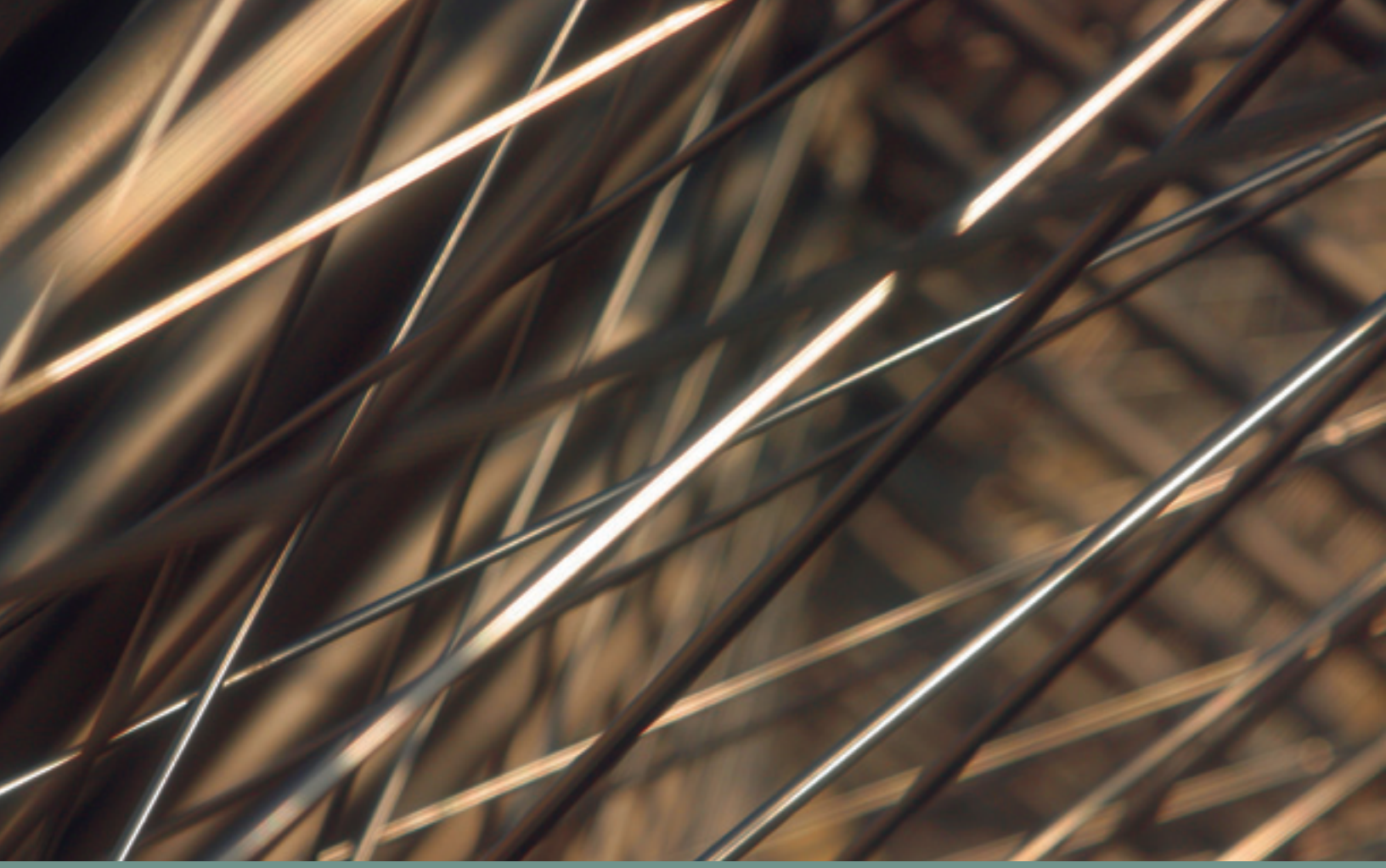
2009 ANNUAL REPORT



TRB

TRANSPORTATION RESEARCH BOARD

OF THE NATIONAL ACADEMIES



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 Transportation Research Board was organized in 1920 and 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 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

DEAR SUPPORTER OF TRB,

THE EVENTS OF 2009 HAVE REMINDED US of transportation's interconnections with national affairs and the economy.

At the federal level, a new administration took over and began to chart its own course for transportation policy, in the context of an ambitious public policy agenda. Federal surface transportation programs expired at the end of September, and—like the aviation programs—are operating on short-term extensions. Responding to the financial crisis, the Congress enacted a massive recovery package that provided tens of billions of dollars for highway and other transportation projects, including a significant downpayment on a national high-speed rail system.

At the same time, some states and local governments, facing declining revenues, have cut back the staffing at their transportation departments and have reduced their services. Freight volumes declined in the aftermath of the financial crisis, and the growth in traffic slowed and even declined for some modes.

Concerns about climate change, greenhouse gas emissions, and energy have been building for some time in the United States; 2009 brought a new sense of urgency to address these issues—the Obama administration accelerated the introduction of more stringent Corporate Average Fuel Economy or CAFE standards, and the House of Representatives passed a climate change bill featuring a cap-and-trade program for carbon emissions.

What does all this mean for TRB? Financially, the support for our programs has been firm and appears stable for now. The economic downturn, however, has affected attendance at TRB events, particularly among transportation professionals from state and local governments. In the longer term, like many other organizations, we face the uncertainties that accompany any reauthorization

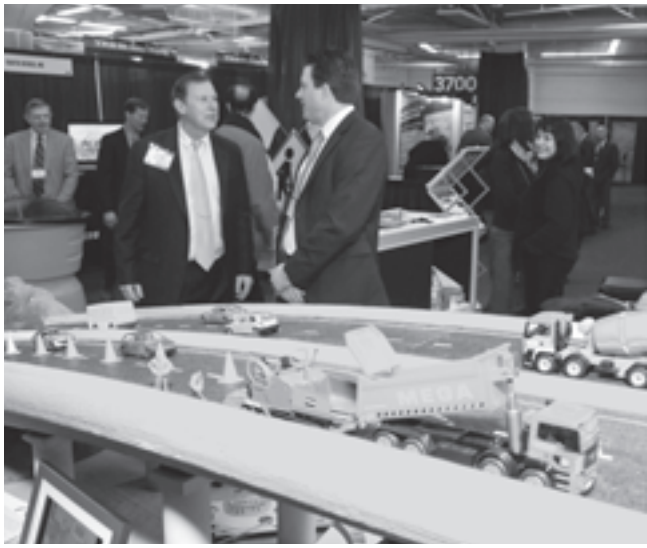
Members of President Barack Obama's Department of Transportation transition team briefed the TRB Executive Committee at the 2009 Annual Meeting in January (*left to right*): Jeff Morales, Peter J. Basso, and Mort Downey; Morales and Downey are past members of the TRB Executive Committee.

Michael R. Morris, Executive Committee Vice Chair (*left*); Adib K. Kanafani, Executive Committee Chair; and Robert E. Skinner, Jr., TRB Executive Director.

of federal programs—perhaps more in this cycle because of the calls for fundamental changes to surface transportation programs, which may or may not have a significant effect on research.

Shifts in policy direction and new national initiatives almost always are reflected in TRB's portfolio of activities and topics. Activities that match up well with these changes receive increased attention, and new activities often arise in response to new policy agendas.

The events and new beginnings of 2009 will play out for some time, but their impact on TRB activities is already apparent, as illustrated in the following highlights. The highlights demonstrate that TRB continues to be a robust and productive organization, delivering a variety of services and opportunities to the transportation communities it serves.



The Annual Meeting Exhibit Hall was an active concourse, showcasing a variety of transportation-related products and services, as well as displays by TRB sponsors. The exhibit by the Forum of European Nations Highway Research Laboratories featured an elaborate model roadway.

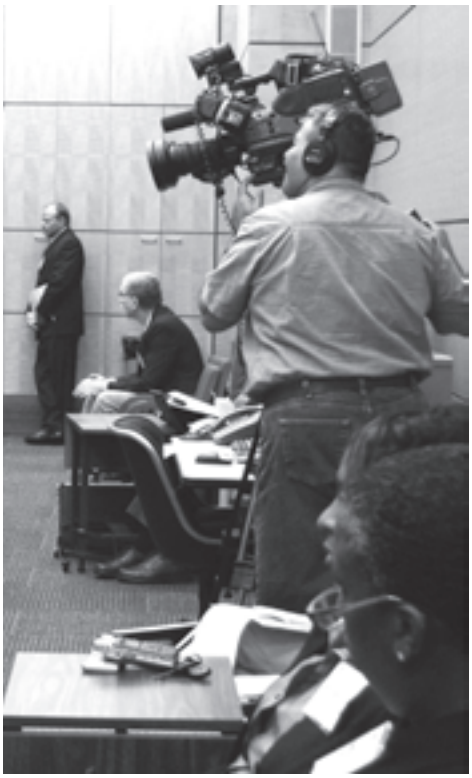
Annual Meeting and Conferences

The 2009 Annual Meeting attracted 10,000 registrants, 500 fewer than the record attendance set last year. Given the difficult economic conditions and the experiences of other large meetings, the drop was much less than might have been expected and is a testament to the continuing value of the TRB Annual Meeting and the many opportunities it affords for information exchange, interactions among researchers, practitioners, and students, and professional growth.

The program included more than 3,500 presentations organized in approximately 650 sessions and workshops. The Annual Meeting exhibits, expanded in 2008 and opened to commercial exhibitors, continued with great success in 2009, drawing 150 exhibitors. Other meeting highlights included the Chairman's Luncheon address by Lawrence D.

The New and Young Attendees Welcome Session, which offers opportunities to learn about TRB, network, and become involved, featured an informative quiz on the Annual Meeting spotlight theme of transportation, energy, and climate change.

General Motors research executive Lawrence D. Burns—a former student of TRB Executive Committee Chair Adib Kanafani—delivers the Chairman's Luncheon Address on high-tech innovations in automotive design.



The Symposium on Research on the Transmission of Disease in Airports and on Aircraft, held at the National Academies' Keck Center in September, received national media attention.

Burns, Vice President, Research & Development and Strategic Initiatives, General Motors Corporation, and the Thomas B. Deen Distinguished Lecture by Geraldine Knatz, Executive Director of the Port of Los Angeles.

During the year, TRB sponsored another 22 conferences and cosponsored 12 others. These totals are down from 2008, again reflecting the difficult economic circumstances. The conferences included a joint midyear meeting of more than 30 TRB standing committees, the 48th Annual Workshop on Transportation Law, and the 34th Annual Ports, Waterways, Freight, and International Trade Conference.

Web-Based Seminars

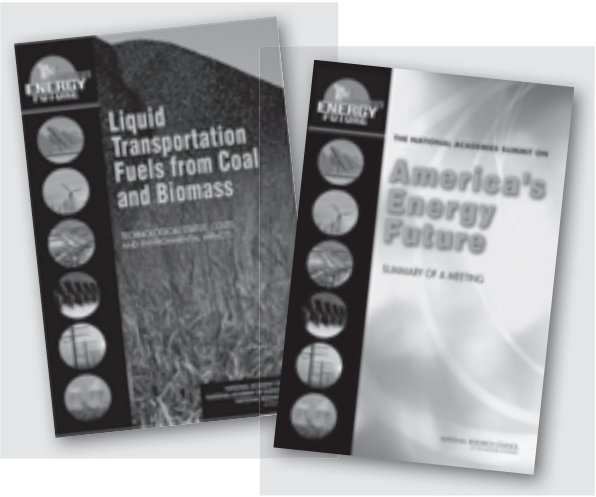
Web-based seminars, or webinars, provide highly cost-effective opportunities to share information and facilitate dialogue. In an era of cost consciousness and travel restrictions, webinars not only transfer information and knowledge efficiently but also serve as an expedient mechanism for engaging professionals—who may have difficulty traveling—in research and national policy issues.

TRB started its webinar program in 2007, expanded the concept in 2008, and in 2009 offered 28 webinars—more than 2 per month. The webinars averaged almost 300 participants each, which exceeds the attendance of many TRB conferences and workshops. Subject matter spanned all modes and covered the range of TRB activities. In 2010, TRB will continue an ambitious schedule of webinars, which will feature early results from the second Strategic Highway Research Program (SHRP 2) and a range of technical and policy-oriented topics.

Transportation, Energy, and Climate Change

As a new sense of urgency arose in 2009 about issues of transportation, energy, and climate change, TRB was well prepared to respond by providing forums for the presentation and discussion of scholarly papers, by sponsoring relevant research, and by producing authoritative studies by expert committees. Transportation, Energy, and Climate Change was the spotlight theme of the 2009 Annual Meeting, which featured more than 60 sessions on related topics, including Climate

Julia A. Gamas, Environmental Protection Agency, moderates the spotlight session, Climate 101: Basics of Climate Change, at the opening of the 2009 Annual Meeting; a companion session covered Climate Change and Transportation 101.



In 2009, the National Research Council released a series of major reports on America's energy future.

Change 101: Basics of Climate Change, at which climate experts explained the science underlying the phenomena. Many TRB standing committees developed and sponsored the sessions in an effort coordinated by TRB's Special Task Force on Climate Change and Energy.

During the year, TRB completed two studies of issues related to climate change—a congressionally mandated study on the effects of compact development on motorized travel, energy use, and carbon dioxide emissions (Special Report 298) and a study to identify research needs related to transportation mitigation and adaptation strategies, as well as research and development needed to introduce mileage-based taxation schemes (Special Report 299). A third study, assessing potential energy savings and greenhouse gas reductions from transportation, is nearing completion. In addition, the National Research Council (NRC), which includes TRB, released a series of major reports on America's energy future and—with the assistance of TRB staff—neared completion of a study on the climate choices facing America.

TRB's Cooperative Research Programs (CRPs) are sponsoring energy- and climate-related research that ranges from the tactical—such as renewable energy for highway maintenance facilities and ways to represent freight in models for air quality and greenhouse gas emissions—to the strategic, such as greenhouse gas reduction strategies for airports and the impacts of climate change on the highway system and approaches to adaptation. SHRP 2 has begun a project to identify within the transportation planning process the key decision points for considering the impacts on greenhouse gas emissions.

Research Management

The scale of TRB's research management activities—through the CRPs and SHRP 2—continued to increase during 2009.

The five CRPs together produced more than 130 publications documenting the results of completed research projects. Included were the first reports from the newest CRPs, which address freight and hazardous material transportation.

The Airport Cooperative Research Program (ACRP) hit its stride in 2009, releasing 35 research reports on topics such as safety management systems at airports, aircraft noise, terminal planning, airport parking, airport governance and ownership, and land use compatibility. Annual funding for ACRP increased from $10 to $15 million under the 2010 Omnibus Appropriations Act.

In addition to its typical portfolio of applied research, the Transit Cooperative Research Program (TCRP) has sponsored the development of bus mechanic certification tests. Two more tests were completed in 2009, bringing the total to nine. A master technician certification is now available

TRB's five Cooperative Research Programs together produced more than 130 publications in various series during 2009.

A special Annual Meeting poster session highlighted work in progress under the SHRP 2 Capacity focus area; Beverly Williams, ICF International, explains the Framework for Collaborative Decision Making on Additions to Highway Capacity.

through the National Institute for Automotive Service Excellence.

The National Cooperative Highway Research Program (NCHRP) added three volumes to its safety series, Guidance for Implementing the AASHTO Strategic Highway Safety Plan. The new volumes address safety data and analysis, reducing motorcycle collisions, and reducing speed-related crashes. NCHRP released a timely web-only research report that explores short-term measures to implement a mileage-based taxation system for highways.

With SHRP 2 approaching its halfway point, 2009 witnessed a shift from project initiation to project management, with $98 million committed to individual research projects. The program passed several other milestones, including the delivery to Congress of the mandated TRB-NRC report on implementing the products of SHRP 2 and the assignment of a Federal Highway Administration (FHWA) technology engineer to serve part-time at SHRP 2 to prepare for the agency's role in implementation.

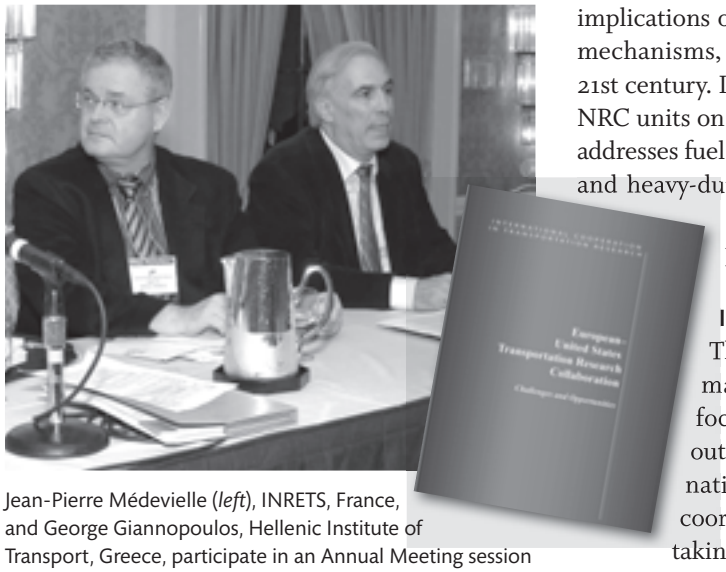
Another milestone was the selection of the six locations where the SHRP 2 Naturalistic Driving Study will be conducted; the recruitment of 1,950 volunteer drivers will begin in 2010. Before its expected conclusion in 2012, the study will monitor the driving habits of 3,000 ordinary motorists. The first five research reports, from the Renewal and Capacity focus areas, were published this year, with many more to follow. The Renewal focus area was the first to have all of its planned research—$32 million worth—fully under way.

Advice to Policy Makers

TRB completed more than 10 special studies during the course of 2009 and published reports. In addition to the reports related to energy and climate change, these include the following:

- *Funding Options for Freight Transportation Projects* (Special Report 297) examines the circumstances that merit a public-sector role in the development of freight transportation projects and recommends appropriate mechanisms for financial assistance.

A TRB letter report examines the State of Alaska's proposed risk assessments of its oil and gas infrastructure. (Photo: Joint Pipeline Office)



Jean-Pierre Médevielle (*left*), INRETS, France, and George Giannopoulos, Hellenic Institute of Transport, Greece, participate in an Annual Meeting session on International Research Collaboration; both are leaders in the European Conference of Transportation Research Institutes, which with TRB issued a report in early 2009 on European–U.S. collaboration in transportation research.

- *Alaska's Oil and Gas Infrastructure: Risk Assessment Peer Review* (letter report) provides a commentary and recommendations on the State of Alaska's proposed risk assessments of its oil and gas infrastructure.

Looking ahead to 2010, TRB will be completing studies on lessons from other countries in achieving ambitious road safety targets, on the equity implications of alternative transportation finance mechanisms, and on naval engineering for the 21st century. In addition, TRB is supporting other NRC units on two reports expected in 2010—one addresses fuel economy technologies for medium- and heavy-duty trucks, and the other is reviewing NASA's aviation safety research programs.

TRB International Activities Committee Chair Jorge A. Prozzi welcomes a full auditorium of attendees at the International Participants' Reception.

International Activities

The 2009 Annual Meeting featured many sessions and presentations focused on transportation activities outside of the United States. The International Activities Committee helped coordinate these sessions, while undertaking its own initiatives to foster closer ties between TRB and international research programs. These include a collaborative endeavor with the European Conference of Transport Research Institutes (ECTRI) to compare the ways that transportation research is organized, funded, and administered in the United States and in Europe. A joint report was published by ECTRI and is available on the TRB website.

The CRPs continued to support international scans that introduce U.S. professionals to innovative practices in other countries. In 2009, TCRP sponsored two scans on public transportation technology and practices; NCHRP, in conjunction with FHWA, sponsored four scans of highway technology and management practices. TRB staff reported on CRP security-related research at two meetings in Europe, aiming for closer coordination of research in this vital and emerging domain.

TRB's increased focus on international activities in the past several years has been guided by Michael D. Meyer, TRB's International Secretary. A former Executive Committee Chair, Meyer completed his tenure on the TRB Executive Committee in January, and Sandra Rosenbloom has succeeded him as our new International Secretary. Among other initiatives, Rosenbloom is organizing a 2010 Annual Meeting session that will explore transportation research collaborations between state departments of transportation in the United States and research organizations from other countries.

President Barack Obama spoke to members of the National Academy of Sciences on April 27, 2009, during the Academy's 146th annual meeting. (Photo: Patricia Pooladi, National Academy of Sciences)

National Academies Update

In this space last year, we announced that a 22-month project to restore the historic National Academy of Sciences building on Constitution Avenue in Washington, D.C., was scheduled to begin in mid-2009. The building's infrastructure systems—heating, air conditioning, and communication—are badly in need of upgrades. Because of the financial crisis, the project was delayed but now appears likely to proceed in 2010.

Several members of the National Academy of Sciences were appointed to senior positions in the new administration with responsibilities related to science and technology. They include Stephen Chu, the Secretary of Energy, and John P. Holdren, Assistant to the President for Science and Technology and Director of the White House Office of Science and Technology. Holdren is also a member of the National Academy of Engineering.


Stephen Chu (*left*), U.S. Secretary of Energy, and John P. Holdren, Assistant to the President for Science and Technology, and Director, White House Office of Science and Technology, are members of the National Academy of Sciences.

Adib K. Kanafani
Chair, Executive Committee

Robert E. Skinner, Jr.
Executive Director

TRANSPORTATION RESEARCH BOARD 2009 EXECUTIVE COMMITTEE*

Chair: Adib K. Kanafani, Cahill Professor of Civil Engineering, University of California, Berkeley
Vice Chair: Michael R. Morris, Director of Transportation, North Central Texas Council of Governments, Arlington
Executive Director: Robert E. Skinner, Jr., Transportation Research Board

J. Barry Barker, Executive Director, Transit Authority of River City, Louisville, Kentucky
Allen D. Biehler, Secretary, Pennsylvania Department of Transportation, Harrisburg
Larry L. Brown, Sr., Executive Director, Mississippi Department of Transportation, Jackson
Deborah H. Butler, Executive Vice President, Planning, and CIO, Norfolk Southern Corporation, Norfolk, Virginia
William A. V. Clark, Professor, Department of Geography, University of California, Los Angeles
David S. Ekern, Commissioner, Virginia Department of Transportation, Richmond
Nicholas J. Garber, Henry L. Kinnier Professor, Department of Civil Engineering, University of Virginia, Charlottesville
Jeffrey W. Hamiel, Executive Director, Metropolitan Airports Commission, Minneapolis, Minnesota
Edward A. (Ned) Helme, President, Center for Clean Air Policy, Washington, D.C.
Randell H. Iwasaki, Director, California Department of Transportation, Sacramento
Susan Martinovich, Director, Nevada Department of Transportation, Carson City
Debra L. Miller, Secretary, Kansas Department of Transportation, Topeka (Past Chair, 2008)
Neil J. Pedersen, Administrator, Maryland State Highway Administration, Baltimore
Pete K. Rahn, Director, Missouri Department of Transportation, Jefferson City
Sandra Rosenbloom, Professor of Planning, University of Arizona, Tucson
Tracy L. Rosser, Vice President, Regional General Manager, Wal-Mart Stores, Inc., Mandeville, Louisiana
Rosa Clausell Rountree, CEO–General Manager, Transroute International Canada Services, Inc., Pitt Meadows, British Columbia, Canada
Steven T. Scalzo, Chief Operating Officer, Marine Resources Group, Seattle, Washington
Henry G. (Gerry) Schwartz, Jr., Chairman (retired), Jacobs/Sverdrup Civil, Inc., St. Louis, Missouri
C. Michael Walton, Ernest H. Cockrell Centennial Chair in Engineering, University of Texas, Austin (Past Chair, 1991)
Linda S. Watson, CEO, LYNX–Central Florida Regional Transportation Authority, Orlando (Past Chair, 2007)
Steve Williams, Chairman and CEO, Maverick Transportation, Inc., Little Rock, Arkansas


Kanafani


Morris


Skinner


Barker


Biehler


Brown


Butler


Clark


Ekern


Garber


Hamiel


Helme


Iwasaki


Martinovich


Miller


Pedersen


Rahn


Rosenbloom


Rosser


Rountree


Scalzo


Schwartz


Walton


Watson


Williams


Allen


Appel


Babbitt


Brewster


Bugliarello


Ferro


Gishi


Hamberger


Horsley


Matsuda


Medford


Mendez


Millar


Quarterman


Rogoff


Szabo

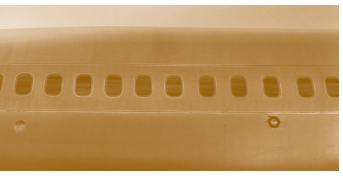

Trottenberg


Van Antwerp

Thad Allen (Adm., U.S. Coast Guard), Commandant, U.S. Coast Guard, Washington, D.C. (ex officio)
Peter H. Appel, Administrator, Research and Innovative Technology Administration, U.S. Department of Transportation (ex officio)
J. Randolph Babbitt, Administrator, Federal Aviation Administration, U.S. Department of Transportation (ex officio)
Rebecca M. Brewster, President and COO, American Transportation Research Institute, Smyrna, Georgia (ex officio)
George Bugliarello, President Emeritus and University Professor, Polytechnic Institute of New York University, Brooklyn; Foreign Secretary, National Academy of Engineering, Washington, D.C. (ex officio)
Anne S. Ferro, Administrator, Federal Motor Carrier 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)
Edward R. Hamberger, President and CEO, Association of American Railroads, Washington, D.C. (ex officio)
John C. Horsley, Executive Director, American Association of State Highway and Transportation Officials, Washington, D.C. (ex officio)
David Matsuda, Deputy Administrator, Maritime Administration, U.S. Department of Transportation (ex officio)
Ronald Medford, Acting Deputy Administrator, National Highway Traffic Safety Administration, U.S. Department of Transportation (ex officio)
Victor M. Mendez, Administrator, Federal Highway Administration, U.S. Department of Transportation (ex officio)
William W. Millar, President, American Public Transportation Association, Washington, D.C. (ex officio) (Past Chair, 1992)
Cynthia L. Quarterman, Administrator, Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, Washington, D.C. (ex officio)
Peter M. Rogoff, Administrator, Federal Transit Administration, U.S. Department of Transportation (ex officio)
Joseph C. Szabo, Administrator, Federal Railroad Administration, U.S. Department of Transportation (ex officio)
Polly Trottenberg, Assistant Secretary for Transportation Policy, U.S. Department of Transportation (ex officio)
Robert L. Van Antwerp (Lt. General, U.S. Army), Chief of Engineers and Commanding General, U.S. Army Corps of Engineers, Washington, D.C. (ex officio)

* Membership as of December 2009.

EXECUTIVE OFFICE



THE TRB EXECUTIVE OFFICE PROVIDES POLICY and operational guidance for programs and activities; oversees committee and panel appointments and report review; provides support and direction for human resource issues and staffing needs; develops and directs the Board's communications and outreach efforts; provides staff support to the Executive Committee and its Subcommittee for National Research Council (NRC) Oversight; and maintains liaison with the executive offices of the National Academies, the Board's parent institution. The Executive Office also manages the editing, production, design, and publication of many TRB reports, including its journal series, magazine, and other titles.

Debra L. Miller (*left*), completing her term as Chair, and Robert E. Skinner, Jr., TRB Executive Director, present the agenda for the TRB Executive Committee meeting in January.

OVERSIGHT ACTIVITIES

The Executive Office supports the work of the TRB Executive Committee, which provides policy direction to TRB programs and activities within the overall policies of the National Academies. Oversight of committee and panel appointments and of report review is the responsibility of the Executive Committee's Subcommittee for NRC Oversight (SNO), which ensures that TRB meets institutional standards and that its activities are appropriate for the National Academies. As part of its oversight function, the subcommittee monitors the Board's progress in expanding the representation of minorities and women on TRB committees and panels. C. Michael Walton, TRB Division Chair for NRC Oversight, heads this subcommittee and represents TRB as an ex officio member on the NRC Governing Board. Henry G. (Gerry) Schwartz, Jr., serves as the SNO Vice Chair, with oversight responsibilities for the second Strategic Highway Research Program (SHRP 2).

(*Left to right*:) Subcommittee for NRC Oversight members Henry G. (Gerry) Schwartz, Jr., Vice Chair; Suzanne B. Schneider, TRB Associate Executive Director; C. Michael Walton, Chair; Debra L. Miller, past chair of the Executive Committee; William A.V. Clark; Adib K. Kanafani, Executive Committee Chair; and Michael R. Morris, Executive Committee Vice Chair.

The Executive Office processes the Board's large volume of committee and panel appointments and maintains committee membership records. A hallmark of the National Academies is its institu-

tional process to ensure the independent, rigorous review of reports. In maintaining these high standards, TRB follows NRC-approved guidelines that carefully match the review criteria and procedures to the type of report.

C. Michael Walton
Chair
Subcommittee for NRC Oversight

H. Gerard (Gerry) Schwartz, Jr.
Vice Chair
Subcommittee for NRC Oversight

Robert E. Skinner, Jr.
Executive Director

Suzanne B. Schneider
Associate Executive Director

PUBLICATIONS

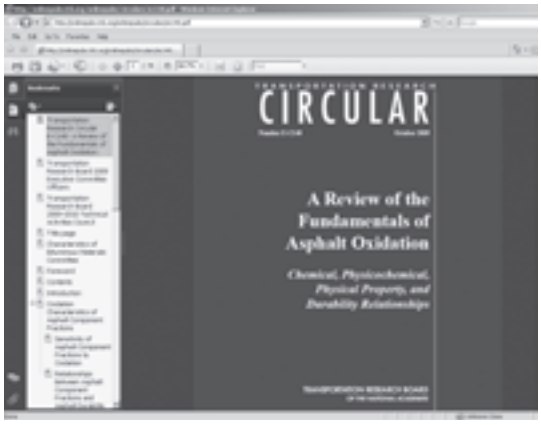
To fulfill one of its oldest missions, TRB disseminates transportation research results and technology information through an extensive array of timely publications. The Board has gained national and international prominence for its books and reports assessing the state of the art or practice in specific areas of transportation, presenting the results of transportation research, addressing major national transportation policy issues, and identifying research needs. TRB continues to expand its publishing effort by releasing a growing number of titles electronically, some exclusively in electronic format.

TRB books and reports span the range of transportation functions, disciplines, and modes. The TRB Publications Office produces titles in the following series:

- *Transportation Research Record: Journal of the Transportation Research Board* gathers technical papers that have been accepted for publication through a rigorous peer review process refereed by TRB technical committees. In 2009, the Board published 51 volumes of the journal, containing 779 papers grouped by subject. TRR Online, inaugurated in 2007, is an online subscription and pay-per-view service for the *Transportation Research Record* series. Record papers are posted simultaneously with release of each printed volume to a searchable, password-protected section of the TRB website, which includes all journal papers published since 1996. The TRR Online system now provides access to more than 10,000 papers that have been published in the TRR series since 1996.[1] The TRR Online service allows all visitors to identify papers of interest and review abstracts of those papers. Access to the full papers is available to service subscribers and employees of TRB sponsors. Papers also may be purchased individually.
- The bimonthly magazine *TR News* features timely articles on innovative and state-of-the-art research and practice in all modes of transportation. News items of interest to the transportation community, profiles of transportation professionals, book and journal summaries, meeting announcements, and highlights of TRB activities also are included. Special features this year included overviews of equity issues in transportation financing, the key role of transportation libraries in the digital age, and the collaborative decision-making framework in development under SHRP 2. The July–August issue focused on congestion pricing for roads; other theme issues examined transportation and the environ-

TRB disseminates transportation information and research findings through an array of publications.

[1] www.trb.org/Finance/Public/TRRJournalOnline1.aspx.



The work of TRB's technical activities committees is published in bookmarked electronic circulars, available on the TRB website.

ment, the impact of changing demographics on the transportation system, and innovations in winter maintenance. Selected features of TR News are posted on the TRB website, and the full issue is made accessible on the web on a four-month delay.[2]

- *Special Reports* contain the results of TRB policy studies on issues of national importance in transportation. These studies—many conducted at the request of federal agencies or of Congress—focus on a variety of complex, often controversial, topics. Special reports published in 2009 included *Implementing the Results of the Second Strategic Highway Research Program: Saving Lives, Reducing Congestion, Improving Quality of Life; Funding Options for Freight Transportation Projects; Driving and the Built Environment: The Effects of Compact Development on Motorized Travel, Energy Use, and CO_2 Emissions;* and *A Transportation Research Program for Mitigating and Adapting to Climate Change and Conserving Energy.* All current and selected out-of-print special reports are posted on the Board's website.[3]
- Conference Proceedings assemble formal papers, presentations, and summaries of discussions from TRB conferences and workshops. *U.S. Marine Salvage Assets and Capabilities in a Maritime Disaster: Summary of a Workshop* was published this year and posted on the web.[4]
- *Transportation Research E-Circulars* collect research problem statements, reports, and technical information from the work of TRB technical activities committees. Topics of Circulars published this year included young impaired drivers, roadway surface discontinuities and safety, maintenance management, critical issues in aviation and the environment, and accelerated pavement testing for maintenance and preservation treatments. Circulars are available exclusively in electronic format on the TRB website.[5]
- *Miscellaneous Reports* include special publications like the *Highway Capacity Manual 2000* and the *Access Management Manual*. The *Highway Capacity Manual 2000* was last updated in 2005 to incorporate corrections and changes as of July 2005; production has started on a new edition, scheduled for release in late 2010. A second printing of the *Access Management Manual* in November included several revisions and updates.

In addition, the Cooperative Research Programs Division produces an array of titles in several publications series. (For a list of all TRB publications, see pages 65–68.)

The Executive Office coordinates topics and speakers for Executive Committee policy sessions; Sue McNeil, University of Delaware, presented a detailed framework for a research and development program to help the transportation sector begin to adapt to the increases in sea level, flooding, and temperature that will accompany climate change.

[2] www.trb.org/Publications/Public/PubsTRNewsMagazine.aspx.

[3] www.trb.org/Publications/Public/PubsPolicyStudiesSpecialReports.aspx.

[4] www.trb.org/Publications/Public/PubsConferencesandWorkshopsConferenceProceedings.aspx.

[5] www.trb.org/Publications/Public/PubsTransportationResearchCirculars.aspx.

Communications Officer Russell Houston (*left*) conducts a survey at the Annual Meeting to gain user information for the new content management system implemented for TRB's website in June; with him is Rail Group Chair Robert Dorer (*right*), Research and Innovative Technology Administration; in the background, Qian Ding (*left*), Waterborne Transportation Institute, Beijing, completes the survey with Customer Service and Marketing Associate Reginald Gillum.

COMMUNICATIONS

TRB is committed to improving the communication and public awareness of transportation issues and to enhancing the dissemination of research findings worldwide. Under the direction of the Board's Senior Communications Officer, TRB has been developing and implementing a variety of initiatives intended to improve communications and outreach.

One of the Board's most successful communications initiatives is the weekly *Transportation Research E-Newsletter*,[6] which reports on transportation research and research-related events within TRB and beyond. Circulation of the free newsletter is currently more than 34,000 and growing. About one-fifth of the readership is from countries outside the United States.

This year, TRB unveiled a redesigned website and significantly enhanced its web briefing or webinar series. TRB's new website is designed to make it easier for users to find TRB news, announcements, and publications in more than 35 subject areas. The site also highlights selected transportation research-related products developed at the federal and state levels and within the academic and international transportation communities. New website functions—such as RSS (really simple syndication), Facebook, e-mail to a friend, and Twitter—allow users to keep up with and to share the latest developments in transportation research. In addition, postings for TRB's programs offer an array of links to content.

Through TRB webinars, transportation professionals share and receive information online in a conference-like atmosphere, but in their own offices. The webinars disseminate information on new TRB reports, TRB Annual Meeting sessions, and topics requested by TRB committees. Approximately three webinars are conducted each month, averaging 300 participants per session. (For a list of 2009 webinars, see page 64.)

Other communications activities include outreach to local government groups, other organizations, and individuals beyond traditional TRB constituencies; and targeting new audiences for specific reports and activities.

[6] www.trb.org/Publications/Public/PubsTRBENewsletter.aspx. To subscribe, send an e-mail to RHouston@nas.edu with "Subscribe TRB E-Newsletter" in the subject field.

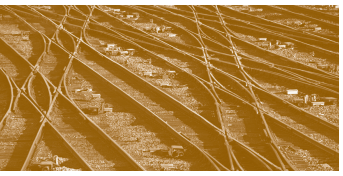
STAFF NEWS

Senior Communications Officer **Russell W. Houston** received a 2009 Communications Award from the National Academies.

Robert J. Summersgill, Committee Appointments and Database Manager, was honored with a National Academies' Community Service Award.

Lea M. Rice joined the staff of the TRB Executive Office–Publications as Assistant Editor, and **A. Regina Reid** came on board as Senior Editorial Assistant–Proofreader.

TECHNICAL ACTIVITIES



THE TRB TECHNICAL ACTIVITIES DIVISION provides a forum for transportation professionals to identify research needs and to share information on research and issues of interest. The division's staff of specialists in each mode and discipline work with thousands of volunteers to carry out activities on behalf of TRB sponsors and the transportation community, which includes the members and friends of more than 200 standing committees.

The TRB Technical Activities Council oversees the organization and activities of these committees. Robert Johns, Director of the Volpe National Transportation Systems Center of the U.S. Department of Transportation's (DOT) Research and Innovative Technology Administration, serves as Chair of the Technical Activities Council. The community is supplemented by TRB representatives in each state transportation department, in more than 150 universities, and in 25 transit agencies.

Common interests, communities, and committees have been the foundations of the Technical Activities Division since TRB started up in 1920. Communications has helped to make these possible and has been a key to their success.

Robert Johns, Chair, Technical Activities Council, introduces award winners for best papers and new emeritus members of standing committees at the TRB Annual Meeting Chairman's Luncheon in January.

EXPANDING THE COMMUNICATIONS PORTFOLIO

"Good communication is as stimulating as black coffee, and just as hard to sleep after."

—ANNE MORROW LINDBERGH

For decades, TRB's communications portfolio relied on face-to-face meetings and printed publications, but in recent years it has expanded as new technological tools have become available. With the economic downturn and restrictions on travel expenditures, applying the full complement of communications tools has become more important than ever. Enhancing TRB's communications portfolio effectively and efficiently was a goal of the Technical Activities Division during 2009. Steps taken to accomplish this goal included the following:

Aviation Economics and Forecasting Committee Chair Charles R. Chambers, Jr. (*right*) briefs a group interested in aviation on getting involved in TRB at the New and Young Attendees Welcome Reception.

- More than 170 TRB standing committees appointed a communications coordinator to work with TRB staff and other committees to enhance their communications portfolios.

Expanding the web presence of TRB committees was one of the goals of the Technical Activities Division in 2009.

Robert C. Johns
Council Chair
Technical Activities

Cynthia J. Burbank
Chair
Policy and Organization Group

Katherine F. Turnbull
Chair
Planning and Environment Group

Mary Lou Ralls
Chair
Design and Construction Group

Daniel S. Turner
Chair
Operations and Preservation Group

Edward Kussy
Chair
Legal Resources Group

Leanna Depue
Chair
System Users Group

Karla H. Karash
Chair
Public Transportation Group

Robert M. Dorer
Chair
Rail Group

Paul H. Bingham
Chair
Freight Systems Group

James M. Crites
Chair
Aviation Group

Jeannie Beckett
Chair
Marine Group

Mark R. Norman
Director
TRB Technical Activities Division

- Committees with exceptional use of new technologies and communications were asked to document their tools and to share their best practices with other committees.
- TRB provided committees with guidance, ideas, training, and a shared website on technological tools, including sample templates and guidance for committee web pages.
- The number of web-based seminars, or webinars, offered by TRB was increased. The average attendance at each webinar approached 300; many of the participants would not have been able to travel to meetings and conferences addressing these topics.
- Committees increased their reliance on conference calls and web-based meetings.
- TRB conducted and recorded training webinars for committee chairs, paper reviewers, Annual Meeting session developers, new committee members, and new TRB state representatives.

Face-to-Face Communications: Bringing People Together

Despite leaps in technology, face-to-face interactions remain the most valuable form of communication. Even in the current economic climate, TRB has continued to experience solid attendance at its major conferences and meetings—a testament to the continuing value of these opportunities for direct communication to the transportation community.

More than 10,000 people attended the 2009 TRB Annual Meeting, January 11–15, in Washington, D.C. The spotlight theme was Transportation, Energy, and Climate Change, with more than 60 sessions and workshops focusing on these critical issues. In addition, approximately 200 organizations participated in the meeting exhibit.

A record 3,700 papers were received by the

More than 10,000 people attended the 2009 TRB Annual Meeting in Washington, D.C., in January—and took home extensive notes to ensure the benefits from the vast program.

Michael Trentacoste, FHWA, addresses the meeting of TRB state representatives in January about upcoming project opportunities.

The TRB 2009 Joint Summer Meeting took place in Seattle, Washington, in July, with the sponsorship of more than 30 committees.

August 1 deadline for consideration for presentation at the TRB 2010 Annual Meeting or for publication in the *Transportation Research Record: Journal of the Transportation Research Board* (TRR), or both. The spotlight theme for the 2010 meeting is Investing in Our Transportation Future: Bold Ideas to Meet Big Challenges.

In addition, TRB was the lead sponsor for 22 conferences and cosponsored 12 others during 2009. Some of the highlights from annual conferences included the following:

- More than 30 standing committees participated in the TRB 2009 Joint Summer Meeting in July in Seattle, Washington. The program theme was Transportation Organizations: Forging Ahead in Uncertain Times.
- In May, the 34th Annual TRB Ports, Waterways, Freight, and International Trade Conference convened at the Beckman Center, with the theme, Critical Research Issues in Freight and Marine Transportation.
- Many sessions at the 48th Annual Workshop on Transportation Law in Denver, Colorado, in July addressed the legal issues raised by the American Recovery and Reinvestment Act (ARRA).

Communicating Across Borders

In January, Sandra Rosenbloom of the University of Arizona was appointed to serve as TRB's International Secretary, reporting to the TRB Executive Committee. Rosenbloom will serve as presiding officer at a TRB 2010 Annual Meeting session exploring transportation research collaboration between state DOTs and international organizations.

With the advent of commercial exhibits, the Annual Meeting exhibit hall is more than ever a focal point for meeting, learning, and networking.

TRB Senior Program Officer Martine Micozzi (*left*) meets with Helene Jacquot-Guimbal, Laboratoire Central des Ponts and des Chaussées, to discuss potential research projects involving international cooperation.

In March, the report, *European–United States Transportation Research Collaboration: Challenges and Opportunities*, was posted to TRB's website and subsequently published by the European Conference of Transport Research Institutes (ECTRI) and distributed throughout Europe.[1] Developed by a TRB-ECTRI working group under the auspices of TRB's International Activities Committee, the report compares and contrasts ways that transportation research is conceived, funded, managed, and administered in Europe and the United States and provides a framework for building a collaborative international transportation research program.

Communicating Through the Written Word

During 2009, TRB published 779 papers in 51 volumes of the TRR. In addition to the printed volumes, TRR papers going back to 1996 are available through an online subscription service.[2] The TRR citation impact factor for 2008, released in mid-2009 by Thomson Reuters Scientific, was 0.259, the highest in recent memory. The TRR Publication Board continued implementing steps to enhance

[1] http://onlinepubs.trb.org/onlinepubs/general/EU-USResearch.pdf.

[2] www.trb.org/Finance/Public/TRRJournalOnline1.aspx.

the TRR peer review process, including new guidelines and training for paper reviewers.

Many TRB standing committees also produced conference summaries and state-of-the-art reports published as e-circulars, as noted in the following sections.

Improving Effectiveness and Efficiency

The Technical Activities staff and volunteer leadership made a concerted effort in 2009 to enhance the effectiveness and efficiency of programs for TRB stakeholders. Division staff retreats early in the year identified, developed, and undertook initiatives in the areas of communications, staff efficiencies, relations with TRB sponsors, committee management, and the TRB Annual Meeting.

The Technical Activities Council established several directives to implement its strategic plan:

- Take maximum advantage of new technologies, communications, and information innovations;
- Identify and address emerging critical and cross-cutting issues;
- Increase the involvement of key constituencies and groups;
- Identify research needs, monitor ongoing research, and ensure the effective sharing of research results;
- Optimize the effectiveness and value of the TRB annual meeting and conferences;
- Ensure the quality, stature, accessibility, and usefulness of TRB publications and products; and
- Ensure the effectiveness of standing committees and recognize research leadership.

Technical Activities Director Mark R. Norman reports to the Executive Committee about standing committee initiatives and results.

More specifics on these efforts and other activities of the division are reported in the following sections.

POLICY AND ORGANIZATION

Transportation Policy

The Fourth International Conference on Women's Issues in Transportation took place October 27–30, 2009, at the Arnold and Mabel Beckman Center in Irvine, California. The conference featured the presentation of approximately 50 research papers addressing ways to meet transportation planning challenges in the context of aging populations and changing demographics, and highlighted efforts to ensure women's safe and secure mobility.

In July, the Native American Transportation Issues Committee met with the Historic and Archeological Preservation Committee in Wyoming to discuss plans to cosponsor a half-day workshop, Management of Historic Properties and Cultural Sites, at the 2010 TRB Annual Meeting. The Native American Transportation Issues Committee is sponsoring two additional workshops: Transportation Safety in Indian Country—Educational and Legal Challenges and The American Recovery and Reinvestment Act in Indian Country.

Seven committees in the Transportation Policy and the Management and Leadership Sections met at the TRB Joint Summer Meeting in Seattle in July. The Taxation and Finance, Congestion Pricing, Strategic Management, and Management and Productivity Committees conducted successful pre- and postconference workshops that collectively attracted more than 100 participants.

A specially appointed TRB–National Research Council Committee met in June to plan the program for the Fourth National Conference on Financing Surface Transportation, which will take place in New Orleans, May 19–21, 2010. The committee issued a call for presentations on innovative methods to leverage transportation funds and to stimulate creative approaches to fund new programs, services, and infrastructure after the expiration of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

In October, the 8th National Conference on Transportation Asset Management: Putting the

The 8th National Conference on Transportation Asset Management in Portland, Oregon, featured 24 sessions emphasizing practical examples of asset management. The opening session featured presentations by (*left to right:)* Anthony R. Kane, AASHTO; Randell H. Iwasaki, California DOT; Gail Achterman, Oregon Transportation Commission; and David S. Ekern (not pictured), Virginia DOT. (Photo: Oregon DOT)

Asset Management Pieces Together included three tracks—pavement management, safety, and data and information infrastructure. The Portland, Oregon, program offered 24 sessions emphasizing practical examples of asset management in a state, region, or local community. A peer exchange examined the topic, Laying the Groundwork for Cutting-Edge Safety Analysis Tools.

Security

Sessions at the 2009 Annual Meeting explored ways to ensure the safety and security of passenger and freight transport. These included the fifth annual workshop on bridge and tunnel security; a workshop focusing on risk management of multimodal transportation infrastructure; and sessions on disaster recovery, innovations in security and safety training, solutions to meeting the nation's energy needs, and a meet-the-author poster session on research in transportation security and critical transportation infrastructure protection. The Critical Transportation Infrastructure Protection Committee sponsored the publication of four peer-reviewed research papers in TRR 2137, *Safety 2009*.

In August, with support from the Federal Highway Administration (FHWA) and the Transportation Security Administration (TSA), TRB and the American Association of State Highway and Transportation Officials (AASHTO) hosted the Transportation Hazards and Security Summit: Progress Through Partnerships at the Beckman Center in Irvine. The four-day event included keynote reports from federal agencies, plus roundtable discussions on infrastructure security, emergency management, communications interoperability, technical assistance, freight and hazardous materials, transit, port security, and airports. Cross-group discussions focused on risk management, emergency response and operations, and policy research needs. TSA hosted an Intermodal Security Training Exercise Program on the final day of the summit. TRB also contributed to the programs of other 2009 security events held around the country.

Data and Information Systems

A series of workshops designed to establish a regional dialogue among data producers and users about successful strategies for the collection, analysis, and sharing of traffic data continued into 2009. In March, the Midwest Traffic Data Workshop attracted 126 participants to Columbus, Ohio, to learn about Successful Strategies in the Collection and Analysis of Data; more than half of the participants were from state, regional, and local governments. At the Northwest Traffic Data Workshop, the fifth in the series, held in Seattle in July, improving the mechanisms for data sharing was a major topic.

Data committees were active at the Joint Summer Meeting in Seattle, sponsoring a session on

Chairs Deborah Johnson, Research and Innovative Technology Administration (*seated, far right*), and Mark Wallace, U.S. Bureau of the Census (*second from right*), guide discussion at the 23rd North American Transportation Statistics Interchange in June.

TRB data workshops provided forums for researchers to share findings and promote dialogue.

Data Challenges and Advanced Solutions for Measuring System Reliability and a session on Finding Solutions Through Data Visualization.

In June, the Data and Tools for Linking Goods Movement, Air Quality, and Transportation Infrastructure Decisions Workshop, sponsored by California Department of Transportation and the California Air Resources Board, focused on defining near-term improvements to data sources to support decisions expected in the next 3 to 5 years.

The North American Freight Flows Conference: Understanding Changes and Improving Data Sources, sponsored by four U.S. agencies and Transport Canada at Irvine in September, continued a 2008 dialogue on improving North American freight transportation data. The program emphasized data partnerships, improving data availability, and using data and analytics to support investment decisions.

In September, the Integrated Corridor System Management Modeling Best Practices Workshop served as a forum for professionals to share experiences across a variety of contexts. In addition to describing modeling tools to analyze the impacts, costs, and benefits of mobility enhancement strategies, the program included group discussions that identified challenges and projected the next steps.

Research and Education

The Conduct of Research Committee and the Technology Transfer Committee met in June at the Keck Center in Washington, D.C., for combined business and technical sessions. A session on intellectual property gave participants many take-home ideas and approaches. The Special Libraries Conference took place in the capital at the same time, providing an opportunity for transportation librarians to gather informally with the TRB committee members and to discuss possible joint activities. In July, the Conduct of Research Committee sponsored a TRB webinar on writing effective research problem statements.

The Research and Education Section established an interest group to explore new media applications for TRB committee activities. With representatives from all of the committees in the section, the New Media group holds regular teleconferences and has established a Wiki site.[3] Activities focus on sharing best practices and improving TRB committee operations with new media and technology. The group is working with TRB staff to define the newly established roles and activities of the communications coordinators.

William A. McComas of Shapiro, Sher, Guinot, and Sandler discusses Intellectual Property Basics: Protecting and Commercializing Intellectual Property at the Conduct of Research Committee midyear meeting in June at the Keck Center.

PLANNING AND ENVIRONMENT

Transportation System Planning

The Transportation Network Committee developed a Primer for Dynamic Traffic Assignment to assist practitioners in determining the appropriateness of a dynamic traffic assignment model for their situation and the steps they would need to take to develop the dynamic traffic assignment. This volunteer effort to address a critical need identified by the Transportation Demand Forecasting Committee exemplifies the contributions that a technical committee can make to the profession.

The Multimodal Statewide Planning Committee revived a tradition of holding a summer peer exchange in Snoqualmie Pass, Washington. The exchange focused on transportation and the economy and produced several research proposals and

[3] http://trbnewmedia.pbworks.com.

Planning and Environmental Policy Group Chair Katherine Turnbull introduces the finalists of the Communicating with John and Jane Q. Public competition, which focused on energy and climate change concepts related to transportation.

plans to collaborate with other TRB committees.

The Public Involvement Committee sponsored the second annual communications competition, Communicating Energy and Climate Change Concepts Related to Transportation with John and Jane Q. Public; the finalists were announced at the 2009 TRB Annual Meeting. The winning entry was Transportation Town.com: A Regional Transportation Website, submitted by Melissa Miller of the Whatcom Council of Governments, Bellingham, Washington.

Several planning committees held summer meetings, many in conjunction with the TRB Joint Summer Meeting in Seattle. The Transportation Planning for Small and Medium Communities met in Denver, Colorado, to focus on strategic plans, developing many new ideas and activities for the coming years. The National Parks and Public Lands Committee met at the Johnsson Center in Woods Hole, Massachusetts, and toured several transportation facilities on Cape Cod. The 12th TRB National Transportation Planning Applications Conference was held in Houston, Texas, in May, drawing a large number of participants to learn from practitioners from around the country.

The May–June issue of *TR News,* coordinated by committees in the Environment and Energy Section, examined transportation and the environment, with the goal of "making [both] better than before."

Social, Economic, and Environmental

The Environmental Analysis in Transportation Committee met in July in Shepherdstown, West Virginia, to discuss the critical role that the evaluation of natural resources plays in addressing the national priority of reinvesting in transportation infrastructure. Also in July, the Transportation and Air Quality Committee participated in the 2009 Transportation Land Use Planning and Air Quality Conference in Denver, exploring the latest research in the coordination of transportation, land use, and air quality, with a focus on strategies to mitigate climate change.

The Ecology and Transportation Committee joined the International Conference on Ecology and Transportation biannual meeting in Duluth, Minnesota, and the Historic and Archeological Preservation Committee joined with the Native American Transportation Issues Committee to conduct a summer workshop in Sheridan, Wyoming. The Transportation-Related Noise and Vibration Committee met in Dayton, Ohio, for a workshop on multimodal noise issues and new technologies for reducing transportation noise and vibration. The Waste Management and Resource Efficiency Committee met in New York in July to discuss sustainable practices, resource management, and other environmental programs.

The Transportation and Sustainability Committee met in July during the TRB Joint Summer Meeting in Seattle to discuss cosponsorship of a 2010 TRB Annual Meeting workshop on Sustainability and Social Measures for Transportation Planning and Project Development. The workshop will identify data sources, processes to gather information, and potential measures to analyze the social, health, and equity aspects of sustainable transportation planning.

Energy and Climate Change

The spotlight theme for the 2009 TRB Annual Meeting was Transportation, Energy, and Climate Change. More than 60 sessions and workshops addressed the theme, ranging across transporta-

tion topics from law to planning to construction. Climate 101: Basics of Climate Change, an opening-day workshop, set the stage for the subsequent focused sessions. The Special Task Force (STF) on Climate Change and Energy helped to coordinate the development of sessions, which also generated a series of TRB webinars over the course of 2009.

The Transportation Energy Committee, the Alternative Transportation Fuels and Technologies Committee, and the Transportation and Sustainability Committee assisted in planning the 12th Biennial Asilomar Conference on Transportation and Energy Policy in July. The theme was Transportation and Climate Policy. Participants from government, industry, nongovernmental organizations, and academia discussed concerns about climate change and considered public and private initiatives to reduce greenhouse gases from the transportation sector.

The STF is working to develop a robust set of research needs statements on transportation and climate change. The effort will culminate in a workshop at the 2010 TRB Annual Meeting. The STF also assembled a set of white papers by expert authors, providing overviews of climate change issues by transportation mode.

DESIGN AND CONSTRUCTION

Design

Committees in the three design sections conducted an array of meetings, sessions, and workshops at the 2009 TRB Annual Meeting.

The Special Task Force on Climate Change and Energy made contributions to the planning of the spotlight theme sessions of the 2009 Annual Meeting and continued to develop initiatives, such as TRB webinars.

Repairs of critical roughness on a concrete bridge deck, from Transportation Research Circular E-C134, *Influence of Roadway Surface Discontinuities on Safety: State of the Art Report*.

The Landscape and Environmental Design Committee held its summer meeting at the 2009 International Conference on Ecology and Transportation in Duluth, Minnesota, in September. Most of the other design section committees met during the summer, often with other TRB committees, and sometimes in conjunction with an AASHTO meeting. Participants discussed progress on committee initiatives, recent research advances, progress in implementing research results, and collaborative efforts with stakeholders.

The Surface Properties–Vehicle Interaction Committee sponsored the publication of an electronic circular, *Influence of Roadway Surface Discontinuities on Safety: State of the Art Report*.[4] Several other committees cosponsored the National Conference on Preservation, Repair, and Rehabilitation of Concrete Pavements, which convened in St. Louis, Missouri, in April, and the Sixth International Conference on Maintenance and Rehabilitation of Pavements and Technology Control, conducted at Politecnico Di Torino, Torino, Italy, in July.

The Structures Section committees cosponsored the 26th Annual International Bridge Conference (IBC) in Pittsburgh, Pennsylvania, and the Lifeline Earthquake Engineering in a Multihazard Environment Conference in Oakland, California, both in June; and the 5th New York City Bridge Engi-

[4] http://onlinepubs.trb.org/onlinepubs/circulars/ec134.pdf.

Chair Mary Lou Ralls briefs the Design and Construction Group about National Cooperative Highway Research Program projects of interest.

neering Conference in Battery Park, New York, in August. At the 26th Annual IBC, committees sponsored two workshops, Bridge Aesthetics: Practical Ideas for Short- to Medium-Span Bridges, and Seismic Accelerated Bridge Construction.

Construction and Materials

A 2009 TRB Annual Meeting workshop examined risk management on highway projects. In February, the Construction Management Committee cosponsored the First International Conference on Transportation Construction Management in Orlando, Florida.

The Management of Quality Assurance Committee published its fourth update of the *Glossary of Highway Quality Assurance Terms* as an e-circular.[5] The Project Delivery Methods Committee sponsored a webinar on risk management in public–private partnerships in June.

Annual Meeting workshops presented the latest developments in the use of sustainable concrete and warm-mix asphalt. The Bituminous Section committees continued to encourage young doctoral student researchers to become involved in TRB by sponsoring a workshop for the presentation of their research in asphalt materials and mixtures. The General Issues in Asphalt Technology and the Characteristics of Bituminous Materials Committees cosponsored the Workshop on Polyphosphoric Acid Modification of Asphalt Binders, which took place in Minneapolis in April.

The Characteristics of Bituminous Materials Committee published an e-circular, *A Review of the Fundamentals of Asphalt Oxidation*, by J. Claine Petersen.[6] The committee also sponsored a TRB webinar in May on design and production of high–reclaimed asphalt pavement mixes.

Soils, Geology, and Foundations

Geotechnical engineering committees sponsored several workshops at the 2009 TRB Annual Meeting:

- The Mineral Aggregates Committee and committees in the Bituminous and Concrete Materials Sections sponsored Aggregate for a More Sustainable Environment;
- The Subsurface Drainage and Geosynthetics Committees sponsored Pavement Subsurface Drainage Principles: Design and State of the Practice, with Pavement Management Section committees;
- The Engineering Behavior of Unsaturated Soils, the Seasonal Climatic Effects Including Frost Action on Transportation Infrastructure, and the Subsurface Drainage Committees sponsored Environmental Effects in the Mechanistic–Empirical Pavement Design Guide, with Pavement Management Section committees;
- The Low-Volume Roads Committee sponsored Safety and Geometric Issues on Low-Volume

Deborah J. Goodings (*right*), Emeritus Member of the Modeling Techniques in Geomechanics Committee, moderates a spotlight session on Geomechanical Engineering Strategies to Meet Effects of Climate Change on Transportation Infrastructure; panelists included (*left to right*:) Ching Tsai, Gordana Petkovic, Mohammed M. Ettouney, Robert Bacchus, and Michael Kearney.

[5] http://onlinepubs.trb.org/onlinepubs/circulars/ec137.pdf.

[6] http://onlinepubs.trb.org/onlinepubs/circulars/ec140.pdf.

Roads, with the Roadside Safety Design Committee; and

- The Hydrology, Hydraulics, and Water Quality Committee sponsored Plan of Action for Scour-Critical Bridges: Regulatory Requirements and Implementation Tools, with the Subsurface Soil–Structure Interaction Committee.

In addition, committees sponsored three webinars: the Engineering Geology Committee, on slope maintenance and slide restoration; the Subsurface Soil–Structure Interaction Committee, on introduction to the capabilities of CANDE-2007; and the Mineral Aggregates and the Soils and Rock Instrumentation Committees, on estimating stiffness of subgrade and unbound materials for pavement design. The Foundation of Bridges and Other Structures Committee sponsored publication of the electronic circular, *Implementation Status of Load and Resistance Factor Design in State Departments of Transportation.*[7]

The Modeling Techniques in Geomechanics Committee cosponsored the 8th International Conference on the Bearing Capacity of Roads, Railways, and Airfields, in Champaign, Illinois, in June; and with the Soils and Rock Instrumentation Committee also cosponsored GeoHunan: Challenges and Recent Advances in Pavement and Transportation Geotechnics, in Hunan, China, in August. The Seasonal Climatic Effects Including Frost Action on Transportation Infrastructure Committee cosponsored the 14th Conference on Cold Regions Engineering, in Duluth, Minnesota, August 29–September 2.

OPERATIONS

Regional Traffic Operations and Management

The Workshop on Advancing Regional Traffic Operations and Management, held in December 2008 in Washington, D.C., brought together leaders in transportation systems management and operations to explore ways to advance regional transportation operations and improve system performance. Through panel discussions, breakout groups, and conversation circles, workshop participants identified effective approaches for advancing regional transportation operations. The Regional Transportation Systems Management and Operations Committee sponsored the workshop.

Traffic operations and management was the topic of a workshop; (*above:*) the Maryland State Highway Administration's Coordinated Highways Action Response Team (CHART) program, based at the Statewide Operations Center in Hanover. (Photo: Maryland SHA CHART Program)

To address issues involving traveler information, the Intelligent Transportation Systems (ITS) Committee sponsored a workshop in April on Identifying Traveler Information Research Needs to Achieve All Roads–All Modes–All the Time, in Irvine, California. Experts in ITS and traveler information systems gathered to suggest directions for real-time traveler information research, demonstration, and evaluation programs.

The 2nd TRB International Symposium on Freeway and Tollway Operations, held in June in Honolulu, Hawaii, drew more than 200 participants from 18 countries to share their views, knowledge,

Phillip Masters of the Ontario Ministry of Transportation (*left*) and chair of the TRB Committee on Freeway Operations chats with Hawaii Lieutenant Governor James Duke Aiona (*right*) and symposium Chair Panos Prevedouros (*center*) of the University of Hawaii at the 2nd International Symposium on Freeway and Tollway Operations in Hawaii in June. (Photo: State of Hawaii)

[7] http://onlinepubs.trb.org/onlinepubs/circulars/ec136.pdf.

and experience on freeway and tollway operations. The symposium's theme was active traffic management. Practitioners, policy makers, and researchers examined the state of the practice in freeway and tollway operations, including current programs and planned initiatives for active traffic management; assessed the costs and benefits of active traffic management; and explored the potential benefits of managed lanes, tolling, pricing, and other strategies to improve traffic operations on congested freeways. The Freeway Operations, the Highway Capacity and Quality of Service, and the Traffic Control Devices Committees organized the symposium, with the cosponsorship of Hawaii DOT, FHWA, the International Bridge Turnpike and Toll Association, and the Dutch Rijkswaterstaat.

MAINTENANCE AND PRESERVATION

All committees in the Maintenance Management Section developed Annual Meeting workshops and sessions and worked with the AASHTO Highway Subcommittee on Maintenance on the 12th AASHTO-TRB Maintenance Management Conference, in Annapolis, Maryland, in July. Major topics addressed in these programs included: asset management; bridge maintenance, inspection, and management; environmental issues; equipment; FHWA's long-term bridge performance program; infrastructure preservation; maintenance management; outsourcing; pavement maintenance; performance measures and performance-based contracting; quality assurance; safety; signing and marking retroreflectivity; vegetation management; winter services; and workforce development. The Roadside Maintenance Operations Committee cosponsored a webinar on Slope Maintenance and Slide Restoration.

Senior Program Officer Frank N. Lisle (*standing, right*) reports on the results of paper peer review to the Work Zone Traffic Control Committee.

Water is injected during a mixing operation as part of the construction process for full-depth reclamation of failed pavements, described in Transportation Research Circular E-C135, *Maintenance Management 2009.*

The annual conference showcasing the work of the University Transportation Centers focused on developing a Research Agenda for Transportation Infrastructure Preservation and Renewal. Participants at the November sessions identified potential opportunities for research addressing inventory and condition assessment; innovative materials for preservation, restoration, and reconstruction; strategies for rapid repair and rehabilitation; and methods to estimate life-cycle costs and support decision making for infrastructure preservation and renewal. In addition to breakout sessions on these topics, more than 60 presentations provided in-depth examples.

The Signing and Marking Materials Committee sponsored webinars on Maintenance Practices for Traffic Sign Retroreflectivity and on Maintenance Practices for Pavement Marking Retroreflectivity.

Members of the Winter Maintenance and Surface Transportation Weather Committees collaborated to develop a theme issue of *TR News* on the changing anatomy of winter maintenance operations.[8]

The structures-related committees in the Bridge Preservation Section—Sealants and Fillers for Joints and Cracks; Structures Maintenance; Bridge Management; Polymer Concretes, Adhesives, and Sealers; and Corrosion—formed a joint subcom-

[8] http://onlinepubs.trb.org/onlinepubs/trnews/trnews265.pdf.

mittee on bridge preservation, to foster bridge preservation research that "focuses on how to define and measure cost-effective bridge network management, cost-effective maximization of structure life, and the correlation of preservation activities, timing, performance, and measured outcomes."

SAFETY

The first edition of the Highway Safety Manual (HSM) was completed and, pending approval, will be published by AASHTO. An e-circular complementing the manual will offer a detailed explanation of the theory and criteria used to develop and apply accident modification factors in the HSM. The HSM Task Force and FHWA conducted a workshop on the Future of Crash Prediction Modeling, which also will be the subject of a forthcoming e-circular.

The Subcommittee on Young Drivers completed the text for an e-circular focusing on research needs in areas of promise beyond graduated driver licensing. The subcommittee's midyear workshop examined the Effectiveness of the Passenger Restriction in Graduated Driver Licensing. The Alcohol and Other Drugs in Transportation Committee prepared an e-circular, *Young Impaired Drivers: The Nature of the Problem and Possible Solutions*, with technical papers from a workshop.[9]

The Roundabouts Task Force completed a proceedings of its 2nd international conference, to be posted on the TRB website. The Railroad Operational Safety Committee held a conference on Teamwork in Railroad Operations; a proceedings is in preparation.

The Development of the Highway Safety Manual Task Force reviews work completed and future directions as the manual approaches publication by AASHTO.

Panelists present insights into Climate Change Law 101: What's in Place and What's Pending (*left to right:*) Kyle Danish, Van Ness Feldman; David H. McCray, California DOT; and Janet L. Myers, FHWA.

LEGAL RESOURCES

Committees in the Legal Resources Group often must respond to an extraordinary event or set of circumstances. These have included the security threat after the terrorist attacks of September 11, 2001; laws and regulations related to climate change; and the legal challenges raised by innovative contracting. This year, the ARRA generated a surge of legal issues. Almost half of the sessions at the 48th Annual Workshop on Transportation Law, which drew 175 participants to Denver in July, focused on this subject.

The Transit and Intermodal Transportation Law Committee examined the ARRA allocation for rail, which has generated interest among transit agencies. The Eminent Domain Committee considered the right-of-way issues that are likely to arise under the ARRA. Through presentations, research suggestions, and committee discussions, the Contract Law Committee examined the legal implications of ARRA provisions for public–private partnerships, as well as its antifraud measures and strict reporting requirements.

The Transportation Law Committee, in cooperation with other committees and independently,

[9] http://onlinepubs.trb.org/onlinepubs/circulars/ec132.pdf.

Michael Bell of the Centers for Disease Control and Prevention presents an overview of how infectious disease spreads, during the Symposium on Research on the Transmission of Disease in Airports and on Aircraft, at the National Academies' Keck Center in Washington, D.C., on September 17, 2009.

continued its work on a range of topics, including employment, Disadvantaged Business Enterprises programs, and conflicts of interest. The Environmental Issues in Transportation Law Committee pursued crosscutting issues in cooperation with other environmental committees.

AVIATION

The Aviation System Planning Committee held its 7th National Aviation System Planning Symposium in May in Pacific Grove, California. The symposium highlighted recent trends and developments in aviation system planning; the first research reports from TRB's Airport Cooperative Research Program; and policy, funding, and research needs to strengthen the aviation system planning process.

The Aviation Group sponsored its first webinar, hosted by the Intergovernmental Relations in Aviation Committee, Back to the Future: Do We Need Aviation Reregulation? The online session updated presentations from the 2009 Annual Meeting, covering the potential for government involvement as a remedy for such problems as increased operational demand that exceeds airport and airspace capacity, causing congestion and delays.

The Light Commercial and General Aviation Committee's subcommittees on regional and commuter airlines and on business aviation met in Washington, D.C., in June to discuss the economic and activity forecasts for the industry.

The Environmental Impacts of Aviation committee prepared *Critical Issues in Aviation and the Environment 2009*, an e-circular updating the 2005 edition.[10] New chapters identify research needs related to sustainability, climate change, and alternative fuels.

FREIGHT SYSTEMS

In keeping with the 2009 TRB Annual Meeting spotlight theme of Transportation, Energy, and Climate Change, the Freight Systems Group committees developed their Freight Day sessions on Moving Freight Through Global Change. Because global supply chains are significant contributors to greenhouse gas emissions, the first session highlighted actions that can be quickly implemented to reduce emissions. Subsequent sessions focused on public- and private-sector policies to reduce carbon emissions from freight transport; the potential impacts of climate change on the physical transportation infrastructure; and supply chain responses to the volatility of fuel prices.

Related spotlight sessions addressed carbon reduction in metropolitan areas; railroad contributions to energy efficiency; the impact of higher-productivity trucks on fuel consumption and emissions; and the risks associated with the transportation of renewable fuels. Other freight-related sessions focused on assessing and addressing the

A U.S. Customs and Border Protection agriculture specialist inspects a shipment of wood materials; the impacts of border inspections on international trade have been a topic at freight-related programs. (Photo: James Tourtellotte, CBP)

[10] http://onlinepubs.trb.org/onlinepubs/circulars/ec138.pdf.

impacts of border inspections on international trade, the Defense Transportation Coordination Initiative, improving the efficiency of intermodal freight terminals, and marine highway advances.

The Freight Systems committees held midyear meetings in conjunction with other events, including the TRB Ports, Waterways, Freight, and International Trade Conference; the TRB Joint Summer Meeting; the University of Michigan's International Conference on Truck Transportation; and the 2009 National Defense Transportation Association Symposium. Other committees met in Washington, D.C. Freight-related discussions at the Joint Summer Meeting addressed opportunities to strengthen economic competitiveness through regional partnerships and cooperation—with perspectives from representatives of a megaregion, a state, and a port—and the relationship between carbon emissions and competitiveness.

A morning session at the 4th International Congress of Smart Rivers 21: The Future of Inland Navigation, held in Vienna, Austria, and cosponsored by TRB in September. (Photo: M. Draper, Austria Tech)

MARINE TRANSPORTATION

Critical Research Issues in Freight and Marine Transportation was the theme of the 34th Annual TRB Ports, Waterways, Freight, and International Trade Conference, held at the Beckman Center in May. Nine speakers identified the most critical research needs in their sectors and challenged researchers to address the needs. Conference participants joined working groups that took up the challenges and developed research problem statements and calls for papers. The program also featured poster displays of student research and a tour of the Ports of Los Angeles and Long Beach, the Alameda Corridor, and the Pacer distribution facility.

Commandant of the U.S. Coast Guard, Admiral Thad Allen, presents the 2008 Harbor Safety Committee of the Year Award to the Southeast Texas Waterways Advisory Council. (Photo: Joedy Cambridge, TRB)

A highlight of TRB's 88th Annual Meeting was the Thomas B. Deen Distinguished Lecture delivered by Geraldine Knatz, Executive Director of the Port of Los Angeles and past Chair of the Marine Board. Knatz's presentation, Local Seaports Driving International Policy, highlighted a range of topics, including the economic value of the nation's seaports, the rationale for a more cohesive national maritime policy, air emissions from port operations, and the impact of port expansion on communities. The lecture and related peer-reviewed papers were published in TRR 2100, *Marine Transportation and Port Operations 2009*.

TRB and the Marine Board, along with the U.S. Coast Guard and the National Oceanic and Atmospheric Administration, hosted the 11th Annual Harbor Safety Committee Conference in Tampa, Florida, in May, with the theme, Critical Path to Safe and Secure Harbors: Communication, Collaboration, and Coordination. Sessions examined marine transportation system challenges, initiatives for maritime safety and security, safety lessons from major maritime incidents, developments in navigational information and services, and issues associated with onshore and offshore energy installations.

Ports, Waterways, Freight, and International Trade Conference participants tour the rail trench of California's Alameda Corridor. (Photo: Eric C. Shen, Port of Long Beach)

Charles R. Cushing of the Marine Board (*left*) congratulates Keith Tantlinger, recipient of the Gibbs Brothers Medal for outstanding achievement in naval architecture and marine engineering, presented by the National Academy of Sciences at the TRB Marine Board spring meeting in May. (Photo: Joedy Cambridge, TRB)

In September, TRB cosponsored the Smart Rivers 2009 conference in Vienna, Austria, which included workshops on financing waterway infrastructure, education and training in inland navigation, and intermodal nodes for efficient logistic chains. Four tracks of concurrent sessions addressed financing, ITS in waterborne transport, successful transportation services on inland waterways, economic development, sustainable transportation systems, and climate change.

The Marine Board held its spring meeting at the Aquarium of the Pacific in Long Beach, California. Presentations and discussions focused on naval engineering in the 21st century, air emissions from ships, the *Cosco Busan* incident and related issues of maritime safety and human factors, offshore operations safety, offshore alternative energy, and ocean observing systems. The Board held its fall meeting in Washington, D.C., in November, with a focus on new activities, including projects for the Office of Naval Research, the Minerals Management Service, and the U.S. Coast Guard.

PUBLIC TRANSPORTATION

Committees in the Public Transportation Group conducted two major conferences and five midyear meetings and published several research documents, including three volumes of the TRR and an issue of *LRT News*.[11] An e-circular of the proceedings of the 11th Joint Light Rail Transit Conference is in preparation and is scheduled for release in spring 2010.

The 11th Joint Light Rail Transit Conference, organized by the TRB Light Rail Transit Committee and the American Public Transportation Association's (APTA) Light Rail Technical Forum, was held in Los Angeles, California, in April, with APTA and the Los Angeles County Metropolitan Transportation Authority as cosponsors. More than 350 transit researchers attended the program, which offered 15 sessions, two meet-the-author poster sessions, a workshop, and five technical tours of Los Angeles light rail lines in operation or under construction.

The 4th National Bus Rapid Transit Conference, organized by the TRB Bus Rapid Transit Systems Committee and cosponsored with APTA, King County Transit, and Community Transit of Snohomish County, convened in Seattle in May. More than 150 participants discussed bus rapid transit in eight program sessions and two tours. The conference was part of the APTA Bus and Paratransit Conference and International Bus Roadeo.

Rendering of King County Metro Transit's upcoming RapidRide bus rapid transit service. Prototypes of the buses were on display at the American Public Transportation Association's International Roadeo in May; TRB organized a conference on bus rapid transit in conjunction with the event. (Source: Karen Rosenzweig)

[11] http://onlinepubs.trb.org/Onlinepubs/lrtnews/LRTv21n1.pdf.

The ARRA has provided funds for the development of rail projects, drawing the attention of TRB Rail Group committees; Washington State DOT has submitted applications for several capital rail projects, including an extension of Amtrak Cascades service between Seattle and Vancouver, British Columbia. (Photo: Washington State DOT)

RAIL

The enactment of two landmark pieces of legislation in October 2008 set the stage for many changes in rail transportation for private industry and public agencies. The Rail Safety Improvement Act of 2008 included a requirement for the implementation of positive train control for much of the nation's rail network by 2015. The Passenger Rail Investment and Improvement Act of 2008 created three new programs to assist in the development of intercity and high-speed passenger rail; in February, the ARRA provided $8 billion to fund this effort. The new programs have begun to influence TRB committee agendas and activities.

Rail committee midyear meetings were held in conjunction with the Annual Research Review of the Association of American Railroads–Transportation Technology Center, Inc., in Pueblo, Colorado, in March, followed by joint meetings in Washington, D.C., in May. In April, the Rail Transit Infrastructure Committee met in Newark, New Jersey, and toured several rail transit operations in Northern New Jersey. In August, the Local and Regional Rail Freight Transport Committee conducted a meeting and tour in conjunction with the Iowa Interstate Railroad.

Rail-related Annual Meeting highlights included workshops on New Technologies for Railroad Infrastructure Assessment and A Careful Look at Rail Transit Project Cost Estimates Versus Actual Delivered Costs. A session on Revitalizing the Link Between Railways and Academia, cosponsored by four rail committees, focused on the need for increased rail education and research. The committee on Intercity Passenger Rail published issues of the online newsletter, *Intercity Rail Passenger Systems Update*, in January and September.[12]

STAFF NEWS

Frederick D. Hejl was named an Associate Division Director; he also was appointed chair of the *TR News* editorial board.

Mary O. Kissi was promoted to Senior Program Associate.

Brie Schwartz was transferred to full-time Web and Software Usability Specialist, to enhance the communications portfolios of the division and its standing committees.

Lyndsey Ann Williams joined the staff as Senior Program Associate in the areas of marine and intermodal freight.

Janet Fraser, a graduate student at Marshall University, served on the staff from September to December as a National Academies Mirzayan Fellow.

[12] http://onlinepubs.trb.org/onlinepubs/irps/irps_14.pdf; http://onlinepubs.trb.org/onlinepubs/irps/irps_15.pdf.

MAJOR AWARDS PRESENTED IN 2009

Thomas B. Deen (*left*), Past Executive Director of TRB, was the recipient of the Frank Turner Medal for Lifetime Achievement in Transportation—an award with multiple sponsors, which is presented biennially. The award recognizes lifetime achievement in transportation, as demonstrated by a distinguished career in the field, professional prominence, and a distinctive, widely recognized contribution to transportation policy, administration, or research. The award citation noted Deen's career accomplishments and international leadership in transportation planning, research, and innovation. He served with distinction as TRB's Executive Director from 1980 to 1994. Before joining TRB, Deen was chief planner for the Washington, D.C., Metrorail system and served for 16 years as Vice President and then President of the transportation consulting firm of Alan M. Voorhees and Associates.

The W. N. Carey, Jr., Distinguished Service Award was presented to **Michael D. Meyer** (*below*), Professor in the School of Civil and Environmental Engineering at Georgia Institute of Technology, Atlanta, Georgia. The award recognizes leadership and distinguished service to TRB. Active in TRB for more than 30 years, Meyer has served on 50 TRB committees, panels, and task forces and has chaired or cochaired more than 15 of these groups, including the Executive Committee in 2006. The award cited Meyer for his energy and vision and for his diversity of interests and expertise in contributing to the entire spectrum of TRB activities and programs.

Dennis C. Judycki (*below*), who retired in 2008 as Associate Administrator for Research, Development, and Technology at the Federal Highway Administration (FHWA), Washington, D.C., was honored with the Roy W. Crum Distinguished Service Award, which recognizes outstanding leadership in transportation research or research administration. Judycki was also Director of FHWA's Turner-Fairbank Highway Research Center. As FHWA's chief manager, overseer, and champion of research, he worked to enhance national programs and develop partnerships in highway research and technology, reaching out systematically to stakeholders and promoting the implementation of innovative research results.

Geraldine Knatz (*above*), Executive Director of the Port of Los Angeles and former chair of the TRB Marine Board, was the recipient of the Thomas B. Deen Distinguished Lectureship. Her topic was "Local Seaport Initiatives Driving International Policy: Eliminating the Effects of Air Pollution and Drawing Up 'Green Prints' for Responsible Growth." Her presentation included a memorable, staged demonstration to dramatize issues related to communities and port expansion. The lectureship award recognizes career contributions and achievements in areas covered by the Board's Technical Activities Division.

STUDIES AND SPECIAL PROGRAMS

THE STUDIES AND SPECIAL PROGRAMS Division conducts policy studies at the request of the U.S. Congress, the executive branch agencies, states, and other sponsors; develops and operates bibliographic databases of ongoing and completed research and provides library reference services; produces syntheses of current practices in highway, transit, airport operations, and commercial truck and bus safety; and manages Innovations Deserving Exploratory Analysis (IDEA) programs in highway, transit, rail and truck safety, and high-speed rail applications.

POLICY STUDIES

With the guidance of committees drawn from the nation's leading experts, the Policy Studies group produces reports examining complex and controversial transportation issues. Studies cover all modes of transportation and a variety of safety, economic, environmental, and research policy issues. The U.S. Congress and the executive branch have adopted many recommendations from TRB policy reports, attesting to the substantive value of the findings.

The Subcommittee on Planning and Policy Review provides oversight for TRB's policy work, under the leadership of former TRB Executive Committee Chair Debra L. Miller, Secretary, Kansas Department of Transportation. Since 1998, all completed policy study reports are posted on the TRB website.[1] *Informing Transportation Policy Choices*, a web document that provides an overview of all TRB policy studies from 1983 through 2006, is also posted on the Policy Studies page of the website.[2]

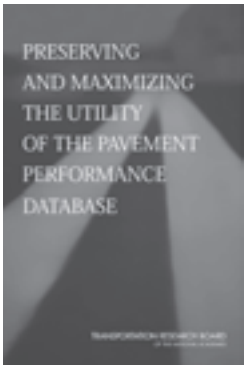
[1] www.trb.org/Publications/Public/PubsPolicyStudiesSpecialReports.aspx.

[2] www.trb.org/Publications/Public/PubsPolicyStudiesInformingTransportationPolicyChoi.aspx.

Completed Reports

Preserving and Maximizing the Utility of the Pavement Performance Database

■ FEBRUARY 2009



The TRB Long-Term Pavement Performance (LTPP) Committee's report, *Preserving and Maximizing the Utility of the Pavement Performance Database*, presents a recommendation for the safekeeping, management, and operation of the LTPP database for the next decades.[3] The LTTP Committee advises the Federal Highway Administration (FHWA) and the American Association of State Highway and Transportation Officials (AASHTO) about the planning and execution of the LTPP studies, a set of operational activities to gather and analyze data from more than 2,500 in-service pavements in the United States and Canada. The principal objective is to further the understanding of how and why pavements deteriorate under traffic loadings and environmental conditions. FHWA funds the committee's work. Victor Mendez chaired the study committee until June 2009, when he was appointed FHWA Administrator.

Funding Options for Freight Transportation Projects

■ AUGUST 2009

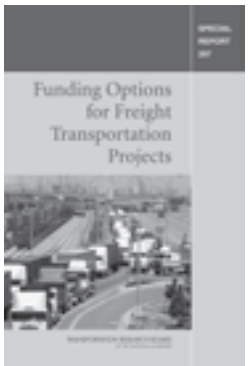
Special Report 297, *Funding Options for Freight Transportation Projects*, explores the public role in financing major freight infrastructure improvement projects, which often span modes, as well as

[3] http://onlinepubs.trb.org/Onlinepubs/sp/ltpp_report_2008.pdf.

Debra L. Miller
Chair
Subcommittee on Planning and Policy Review

Stephen R. Godwin
Director
Studies and Special Programs

Freight truck and automobile traffic on I-81 in Virginia. The study committee for Special Report 297 offers guidance on increased federal involvement in financing freight projects. (Photo: Al Covey, Virginia Department of Transportation)



the public and private sectors. The study committee analyzes "national significance" as a possible criterion for determining federal responsibility and examines alternative finance arrangements for freight infrastructure.[4]

The report presents findings about the following:

- The adequacy of current finance arrangements for maintaining and improving freight system performance;
- The goals that finance reform should serve; and
- The impact of various reforms on system performance.

The committee's recommendations offer guidance on increased federal involvement in financing freight projects and on the form that this involvement should take. Initiated by the TRB Executive Committee, the study was funded by TRB and the UPS Foundation. Genevieve Giuliano, University of Southern California, chaired the study committee.

Driving and the Built Environment: The Effects of Compact Development on Motorized Travel, Energy Use, and CO_2 Emissions

■ SEPTEMBER 2009

Special Report 298, *Driving and the Built Environment: The Effects of Compact Development on Motorized Travel, Energy Use, and CO_2 Emissions*, is the result of a study requested by Congress in the Energy Policy Act of 2005 and funded by the Department of Energy in 2007. The study committee compares present development patterns with patterns of increased density and mixed use and develops estimates of the impact on personal vehicle travel, energy consumption, and carbon dioxide (CO_2) emissions.[5]

The committee develops scenarios that rely on (*a*) a critical review of studies that estimate the relationships between development patterns and personal vehicle travel and (*b*) projected changes in residential development as the population expands. According to the findings, if 25 to 75 percent of future residential development occurs at density levels that are twice as high as current levels and includes greater mixed use and transit, then personal vehicle travel, energy consumption, and CO_2 emissions would decline by 1 to 11 percent by 2050, compared to the business-as-usual base case. The committee disagreed, however, about the plausibility of compact and mixed-use development reaching a level of 75 percent. José A. Gómez-Ibáñez, Harvard University, chaired the study committee.

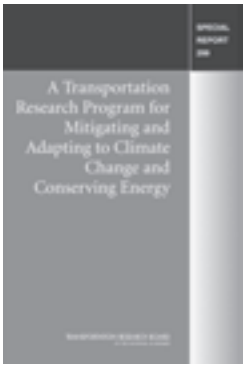
According to findings published in Special Report 298, if a large part of future residential development occurs at high density, with increases in mixed use and transit—as in the Clarendon area of Northern Virginia—personal vehicle travel, energy consumption, and CO_2 emissions could decline by 1 to 11 percent by 2050. (Photo: Arlington County, Virginia)

[4] http://onlinepubs.trb.org/Onlinepubs/sr/sr297.pdf.

[5] http://onlinepubs.trb.org/Onlinepubs/sr/sr298.pdf.

A Transportation Research Program for Mitigating and Adapting to Climate Change and Conserving Energy

■ OCTOBER 2009



The TRB Executive Committee initiated the study that produced Special Report 299, *A Transportation Research Program for Mitigating and Adapting to Climate Change and Conserving Energy*, with funding from TRB and the National Cooperative Highway Research Program (NCHRP). With reauthorization of surface transportation programs pending, the study committee develops research program proposals to examine the costs and effectiveness of strategies to mitigate the contributions of surface transportation to greenhouse gases and to the consumption of energy, as well as appropriate strategies for adapting transportation infrastructure and operations to climate change.[6] The goal of the recommended research programs is to close knowledge gaps, inform policy makers, and promote implementation of effective and cost-efficient strategies. Michael D. Meyer, Georgia Institute of Technology, chaired the committee.

Letter Reports

Pavement Technology Review and Evaluation

■ MARCH 2009

The Committee for Pavement Technology Review and Evaluation provides an ongoing peer review of FHWA's pavement technology research and deployment programs. The committee's letter report addresses stakeholder involvement; the issues, needs, and gaps in the program's focus areas; program performance measures; the objectives and accomplishments of programs earmarked for pavement technology; the training of highway personnel for technology deployment and implementation; and the status of the Long-Term Pavement Performance (LTPP) program.[7] FHWA funds the committee's work. Carlos Braceras, Utah Department of Transportation, chairs the committee.

With committee member Carl Monismith of the University of California, Berkeley, attending via video (*far right*), the Long-Term Pavement Performance Committee meets at the Keck Center in October.

Review of U.S. Department of Transportation Study on Implementation of Changes to the Section 4(f) Process

■ MARCH 2009

In the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), Congress allowed the Secretary of Transportation to forgo regulatory procedures for analyzing projects involving 4(f) resources when the impacts on the environment are minor, or de minimis. In addition, Congress instructed U.S. DOT to clarify inconsistent judicial rulings on the feasibility and prudence of alternative analyses; to study the impact of these changes; and to have the study plan and report reviewed by a TRB committee. In its second letter report, the committee reviews the U.S. DOT Phase I draft report's findings about the de minimis impacts.[8] The committee notes that the sample size selected by U.S. DOT is inadequate and that the opinions collected through surveys and interviews lack diversity.

The committee recommends that U.S. DOT either temper the findings in the draft or delay completion of the report until more information is gained about the projects from a wider diversity of stakeholders. Michael D. Meyer, Georgia Institute of Technology, chairs the committee. FHWA funds the work.

[6] http://onlinepubs.trb.org/Onlinepubs/sr/sr299.pdf.

[7] http://onlinepubs.trb.org/onlinepubs/reports/PavTecComm_mar_2009.pdf.

[8] http://onlinepubs.trb.org/Onlinepubs/reports/4f_march2009.pdf.

The Committee on Alaska's Oil and Gas Pipeline Infrastructure discusses a contractor's proposed approach for a comprehensive risk assessment of the State of Alaska's oil and gas infrastructure.

Review of the Federal Railroad Administration's Research and Development Program

■ APRIL 2009

TRB's Committee for Review of the Federal Railroad Administration (FRA) Research and Development Program issued a letter report about the fundamental changes taking place at the agency as a result of implementation of the Rail Safety Improvement Act of 2008 and the Passenger Rail Investment and Improvement Act of 2008, the change of administration in January, and the enactment of the American Recovery and Reinvestment Act in February 2009.[9] The letter report offers recommendations to support FRA's research and development (R&D) efforts during this transition period, reviews FRA's proposed rail research against the proposals identified in a 2006 workshop organized by the committee, and examines priority research areas that FRA should pursue. The committee is chaired by Robert Gallamore, Northwestern University (retired). Its work is supported by FRA.

Review of the Federal Transit Administration's R&D Program

■ MAY 2009

The Transit Research Analysis Committee (TRAC) was established in 2004 to help the Federal Transit Administration (FTA) develop and implement a strategic plan for transit R&D and to provide guidance on the federal role. In its sixth letter report, the committee expresses support for the steps that FTA is taking in its strategic planning process. FTA proposes to organize its R&D into a series of portfolios, each directed at measurable targets that meet the objectives of FTA's strategic goals.[10]

The committee's letter report reviews the most developed portfolio, on electric drive, and expresses some concerns. Nonetheless, the committee notes FTA's progress in developing a strategic R&D planning process that will make the agency a national leader in R&D.

The committee urges FTA to move expeditiously in developing its other portfolios and in establishing a schedule for updating the plan to meet the information needs of policy makers within and outside FTA. J. Barry Barker, Transit Authority of River City, Louisville, Kentucky, chairs the committee. Its work is funded by FTA.

Peer Review of Alaska's Oil and Gas Infrastructure Proposed Risk Assessment

■ OCTOBER 2009

In 2006, a spill from a corroded pipeline led to the short-term shutdown of North Slope oil production in Alaska. In May 2007, the state of Alaska decided to conduct a comprehensive risk assessment of its oil and gas infrastructure. The Alaska Department of Environmental Conservation selected a contractor to design a risk assessment and asked TRB to review the design before the state made a commitment.

The committee's review points out flaws in the proposed design and recommends an improved approach.[11] The project is funded by the Alaska

[9] http://onlinepubs.trb.org/onlinepubs/reports/frar&d_April_2009.pdf.

[10] http://onlinepubs.trb.org/onlinepubs/reports/trac_May_2009.pdf.

[11] http://onlinepubs.trb.org/onlinepubs/reports/AlaskaRiskAssessment_Oct_2009.pdf.

Department of Environmental Conservation. Paul Fischbeck, Carnegie-Mellon University, chairs the committee.

Ongoing Studies

The Policy Studies group supports committees that provide ongoing reviews of FHWA's research and technology programs, pavement technology deployment programs, and the LTPP program, as well as the research programs of FRA and FTA. The group also works on a variety of important—and sometimes controversial—topics. Ongoing studies are described below.

Reducing Greenhouse Gas Emissions and Saving Energy in Transportation

In recognition of the renewed interest in saving energy and reducing greenhouse gas emissions, the TRB Executive Committee initiated a study to examine the full array of options for transportation and to identify promising strategies for policy makers. The project began in late 2007 and will be completed by early 2010.

Traffic Safety Lessons from Benchmark Nations

Another study initiated by the TRB Executive Committee is examining the experience of nations that have been most successful in reducing traffic fatalities and injuries. The study will determine how these nations built the political will to implement controversial behavioral interventions and which approaches may be transferable to the United States. The report will be released in early 2010. Funding is provided by TRB and the General Motors Foundation.

Equity Implications of Alternative Forms of Transportation Finance

Because of the growing interest in alternative finance mechanisms and the inclusion of equity among the *Critical Issues in Transportation* defined by the Executive Committee,[12] a policy study is examining the equity implications of alternative forms of transportation finance. The study committee held a symposium in September 2009 to review and discuss commissioned papers. The committee will provide guidance to public officials in a report slated for completion in mid-2010.

Brian Taylor (*left*), confers with Jeffrey Buxbaum (*center*) and T. Keith Lawton at a meeting of the Committee on Equity Implications of Alternative Transportation Finance Mechanisms. The committee convened in May at the Keck Center to explore the equity implications of alternative funding mechanisms for transportation projects.

International Experience in Multimodal Transportation Research Framework Development and Research Implementation

Encouraged by successes observed abroad on a research management scan sponsored by NCHRP and FHWA, participants recommended an analysis of international experience in developing multimodal transportation research frameworks. The study examines how the frameworks support national goals and rely on independent research institutes to facilitate the implementation of research results.

Naval Engineering for the 21st Century

The U.S. Navy Office of Naval Research has requested a TRB Marine Board project to assess whether the national investment in human capital and research infrastructure for naval engineering is sufficient for conducting and implementing the research needed to design advanced warships. The project will be completed in early 2011.

Review of Advanced Models That Estimate Air Traffic Complexity

At the request of the Federal Aviation Administration (FAA), a committee is reviewing a suite of models developed by the MITRE Corporation for FAA. The models combine historic records of air

Bruce Schaller, Deputy Commissioner of Planning and Sustainability, New York City Department of Transportation, presents findings on congestion pricing in New York at the Symposium on Equity Issues in Financing Transportation at the Keck Center, September 2.

[12] http://onlinepubs.trb.org/Onlinepubs/general/CriticalIssues09.pdf.

A Federal Aviation Administration controller works in Denver International Airport's control tower at dusk; a study committee is reviewing models for air traffic flows and the demands on air traffic controllers. (Photo: Denver International Airport)

traffic flows with advanced models of the demands that such traffic places on air traffic controllers. This study is expected to be completed in the fall of 2010.

Other New Projects

Other new studies starting up at the end of the year include Strategies for Improved Travel Data, funded by FHWA, NCHRP, the Bureau of Transportation Statistics (BTS), and TRB; a TRB Marine Board project, Offshore Oil and Gas Platform Safety Inspection Program: A Review, funded by the Minerals Management Service; and Economic Benefits of Highway Investments During Economic Downturns: A Scoping Study, funded by NCHRP and TRB.

INFORMATION SERVICES

Transportation Research Information Services

The Transportation Research Information Services (TRIS) database is the world's most comprehensive online bibliographic database of transportation research information. TRIS contains more than 740,000 records of published and ongoing research in all modes and disciplines of transportation. Approximately 30,000 new records were added in 2009.

TRIS expanded its international coverage this year by exchanging records with the ARRB Group in Australia, the Swedish National Road and Transport Research Institute, and the Institute for Road Safety Research in the Netherlands. TRIS also now includes transportation theses and dissertations collected from graduate schools by the transportation libraries at Northwestern University and the University of California, Berkeley.

Several enhancements were made to TRIS to help users access indexed documents. More than 50,000 records now have direct links to full-text documents. Other new links allow TRIS users to locate libraries that own a document of interest.

Most of the TRIS database is available on the Internet as TRIS Online through the BTS National Transportation Library website.[13] TRB produces and maintains TRIS, and BTS makes the database accessible on the web without charge.

In 2009, TRB released TRISworld, a new product for sponsors, supplementing the TRIS database with 112,000 English language records from the International Transport Research Documentation (ITRD) database of the Organisation for Economic Co-Operation and Development (OECD).[14] Among the many features requested by TRB sponsors, TRISworld provides simple and advanced searching and allows users to print, export, and e-mail results in a variety of formats.

TRIS is also available on the Internet for a fee through Dialog, Inc., and as part of the TRANSPORT database, a cooperative effort between TRB and ITRD. TRANSPORT is produced and distributed by Ovid–SilverPlatter.

During 2008, the Information Services group began developing a strategic plan to examine options for TRIS and the Research in Progress (RiP) database in the changing information environment. A survey of users was conducted with the help of TRB committees; four focus groups were convened; and a white paper by information professionals was commissioned. A draft of the strategic plan was presented at the TRB 2009 Annual Meeting and subsequently has been refined to inform TRB management decisions.

The TRB Publications Index is a searchable database available on TRB's website that contains all

[13] http://ntlsearch.bts.gov/tris/index.do.

[14] http://trisworld.trb.org/.

TRB's Information Services staff: (*standing, left to right*) James W. Yates, Jr., Shirley A. Morin, Barbara L. Post, Jack C. Chen, Norma Hansell-Price, and (*seated, left to right*) Jessica Fomalont and Nancy D. Choudhry.

TRB, Highway Research Board (HRB), Strategic Highway Research Program (SHRP), and Marine Board publications since 1923.[15] The TRB Publications Index offers simple and advanced searching and allows users to view, download, and e-mail the results in a variety of formats. The index provides direct web links to available full-text documents and to ordering information.

Research Needs Statements Database

The Research Needs Statements Database is a dynamic collection developed by TRB technical standing committees and reflects priorities.[16] The database serves as a tool for reviewing transportation research needs, setting research priorities, and identifying gaps in current research. More than 800 statements of research needs are available on the database.

Research in Progress Database

RiP is a searchable database of more than 11,000 records of active or recently completed research projects.[17] University transportation centers use the RiP as a clearinghouse for research, fulfilling a requirement in SAFETEA-LU. The Research and Innovative Technology Administration funded the software enhancements to facilitate this application.

Individuals from state DOTs and university transportation centers can add, modify, or delete records of research through a web-based data entry system. A current awareness service notifies users automatically about new and updated project records in specified subject areas. The RiP contains international project records from ITRD's Transport Research in Progress (TRIP) database. The RiP website received more than half a million visits from users worldwide in 2009.

TRB Library

The TRB Library is a small, specialized library that provides reference and information services to TRB sponsors, committee members, and staff. Many state DOTs regularly request the library's services. The library subscribes to more than 370 serial titles and contains a complete collection of TRB, HRB, SHRP, and Marine Board publications.

The TRB Library is included in the Transportation Library Catalog through the National Transportation Library and the Online Computer Library Center's WorldCat and participates in the Eastern Transportation Knowledge Network.

SYNTHESIS PROGRAMS

Cooperative Research Programs Synthesis Studies

Under the sponsorship of the Cooperative Research Programs administered by TRB, the Synthesis unit prepares reports on current practice and knowledge for a range of key highway, transit, and airport topics. Practitioners and researchers make extensive use of the reports.

A highway panel, a transit panel, and an airport panel of the Cooperative Research Programs select the study topics each year. In 2009, the panels selected 12 new highway, 7 new transit, and 5 new airport studies. A consultant experienced in the topic area researches and writes each Synthesis report, with guidance from an expert panel.

[15] www.trb.org/InformationServices/Public/TRBPublicationsIndex.aspx.

[16] http://rns.trb.org/.

[17] http://rip.trb.org/.

ILLUSTRATIVE SYNTHESIS REPORTS, 2009

Synthesis of Airport Practice

16 Compilation of Noise Programs in Areas Outside DNL 65
17 Integrating Airport Development and Federal Environmental Review Processes

Synthesis of Highway Practice

388 Pre-Overlay Treatment of Existing Pavements
391 Public-Sector Decision Making for Public–Private Partnerships
392 Transportation's Role in Emergency Evacuation and Reentry
396 Monitoring Scour-Critical Bridges

Synthesis of Transit Practice

79 Light Rail Vehicle Collisions with Vehicles at Signalized Intersections
80 Transit Security Update

Synthesis of Commercial Truck and Bus Safety Practice

MC-22 Special Safety Concerns of School Bus Drivers

A list of reports published in the past 12 months appears on pages 66–68. Approximately 3,500 copies of each report are published in hard copy, and 3,000 of these are distributed to state DOTs, transit agencies, airport operators, and TRB topic-area subscribers. The reports also are posted on the TRB website.[18]

TRB maintains an inventory of hard-copy Synthesis reports for sale. Illustrative airport, highway, and transit titles published in 2009 are listed in the box above.[19]

Commercial Truck and Bus Safety Synthesis Program

The Commercial Truck and Bus Safety Synthesis Program (CTBSSP) is a cooperative research program sponsored by the Federal Motor Carrier Safety Administration (FMCSA) and administered by TRB. The program was authorized in 2001 to support FMCSA's safety research programs. In 2007, FMCSA reauthorized CTBSSP through a cooperative agreement, providing $200,000 annually through 2012. This funding supports two new studies each year.

The studies summarize current practice in a specific technical area in commercial truck and bus safety, usually through a literature search and a survey of organizations such as state DOTs, enforcement agencies, commercial truck and bus companies, or other appropriate groups. The program is modeled on the synthesis programs of NCHRP and the Transit Cooperative Research Program (TCRP). The primary users of the synthesis final reports are practitioners who are facing the issues or problems addressed, in a variety of settings.

A program oversight committee monitors CTBSSP and the program procedures; selects topics annually, after periodic, industrywide solicitations; refines scopes; selects researchers to prepare each synthesis; reviews products; and makes publication recommendations. The program oversight panel has authorized 23 synthesis topics. One CTBSSP report, listed on page 68, was published in 2009 and is available on the TRB website.[20] Two new topics started up in 2009.

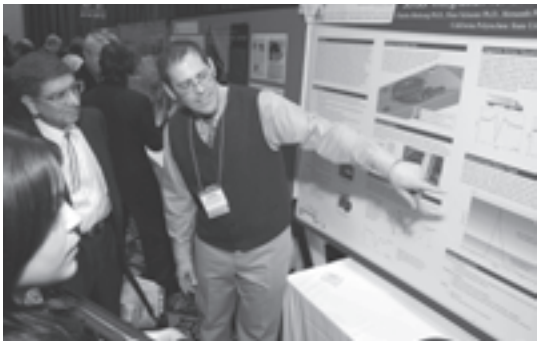
INNOVATIONS DESERVING EXPLORATORY ANALYSIS PROGRAMS

IDEA programs fund early-stage investigations of potential breakthroughs in transportation technology. Through small projects, researchers investigate the feasibility of innovative concepts that could advance transportation practice. IDEA programs sponsor high-risk research that is independent of the immediate mission concerns of public agencies and of the short-term financial imperatives of the private sector.

[18] Airport syntheses: www.trb.org/Publications/Public/PubsACRPSynthesisReports.aspx; highway syntheses: www.trb.org/Publications/Public/PubsNCHRPSynthesisReports.aspx; transit syntheses: www.trb.org/Publications/Public/PubsTCRPSynthesisReports.aspx.

[19] Synthesis reports may be ordered from the TRB Online Bookstore, www.trb.org/Finance/Public/Bookstore.aspx, or by calling 202-334-3213.

[20] www.trb.org/Publications/Public/PubsCTBSSPSynthesisReports.aspx.



Peter Schuster, California Polytechnic University, highlights progress on an automatic diagnostic system for air brakes in trucks at the poster session, TRB's IDEA Programs: Sparking Innovation in Transportation.

The state DOTs collectively fund highway-related research through the NCHRP IDEA program. Research on innovations applicable to transit practice is carried out under the Transit IDEA program, funded by FTA through TCRP. FRA and FMCSA cosponsor the Safety IDEA program, which supports projects to improve the safety of truck, intercity bus, and rail operations.

In 2009, the High-Speed Rail (HSR) IDEA program, sponsored by FRA to advance the safety and performance of the U.S. rail system, ceased operation after the U.S. Congress discontinued funding for the national HSR program. A renewed national high-speed rail program has been proposed, however, offering an opportunity to renew the HSR IDEA program.

Each IDEA program follows a similar administrative model, adapted for sponsorship arrangements and target audiences. Each program operates through a committee or panel of volunteer transportation experts who solicit, review, and select proposals that merit research contracts. Because IDEA projects are high-risk investigations of unproven concepts, funds awarded for any one project are usually less than $100,000. Frequently, however, IDEA funds are augmented through cost-share arrangements, nearly doubling the amount of research that can be supported through the IDEA programs.

At the 2009 TRB Annual Meeting, the highway, rail, and safety IDEA programs conducted a joint poster session, TRB's IDEA Program: Sparking Innovation in Transportation. The Transit IDEA program held a similar session. The two sessions highlighted 18 of the most promising current projects and received a constant stream of interested visitors, who were able to interact directly with the inventors.

An annual report that includes summaries of completed and current projects is published for each of the IDEA programs and is distributed at the TRB Annual Meeting. These summaries also are available on the IDEA page of the TRB website, along with the IDEA Program Announcement, which contains forms and guidelines for submitting proposals.[21] A less formal publication, *Ignition*, features interviews with IDEA investigators and transportation leaders, plus articles that highlight promising projects.[22] Issues of *Ignition* are archived on the IDEA website.

In 2009, contractor final reports for completed IDEA projects were made publicly available through the TRB website.[23]

News and updates on the IDEA program can be found in the magazine *Ignition.*

Gordon Drukier of Advanced Fuel Research, Inc., presents a project that would detect radioactivity in transit stations to a panel for the Transit IDEA program in August.

STAFF NEWS

Jo Allen Gause joined the Synthesis staff as a contractor responsible for NCHRP Synthesis studies.

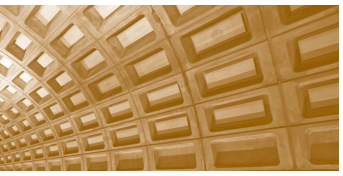
Demisha Williams started as Senior Program Assistant for the IDEA Program and for Synthesis Studies.

[21] www .trb.org/IDEAProgram/Public/IDEAProgram.aspx.

[22] www.trb.org/Publications/Public/PubsIDEAIgnitionMagazines.aspx.

[23] www.trb.org/IDEAProgram/Public/IDEAProgram.aspx.

COOPERATIVE RESEARCH PROGRAMS



TRB ADMINISTERS FIVE COOPERATIVE research programs:

- The National Cooperative Highway Research Program (NCHRP), sponsored by the American Association of State Highway and Transportation Officials (AASHTO) in cooperation with the Federal Highway Administration (FHWA);
- The Transit Cooperative Research Program (TCRP), sponsored by the Federal Transit Administration (FTA);
- The Airport Cooperative Research Program (ACRP), sponsored by the Federal Aviation Administration (FAA);
- The National Cooperative Freight Research Program (NCFRP), sponsored by the Research and Innovative Technology Administration (RITA); and
- The Hazardous Materials Cooperative Research Program (HMCRP), sponsored by the Pipeline and Hazardous Materials Safety Administration (PHMSA).

Cooperative Research Programs (CRP) Director Christopher W. Jenks provides the Executive Committee with an overview of the growth, activity, productivity, and progress in TRB's five CRPs.

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

NCHRP is an applied research program that responds to the needs of state highway and transportation departments by solving pressing operational problems. Although NCHRP accounts for a small percentage of the nation's annual investment in highway research, its close association with AASHTO and its position within the National Academies have enabled the program to carry out important research resulting in practical products.

Since 1962, NCHRP has administered 1,320 research projects. More than 1,068 publications have appeared in the *NCHRP Report* and *NCHRP Synthesis of Highway Practice* series, in addition to 339 volumes of *Research Results Digest* and 53 volumes of *Legal Research Digest*, as well as 200 other deliverables published electronically.

NCHRP projects for federal fiscal year (FY) 2009 were placed under contract as funds became available. Proposal solicitations for 35 research projects in federal FY 2010 (October 1, 2009, through September 30, 2010) were released starting in August 2009; depending on the availability of the funding authorized in federal legislation, contracts should be executed in the first three months of 2010.

Under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), the Federal-Aid Highway State Planning and Research Funds have been increasing slightly, and NCHRP funding is affected proportionally. Funding available for NCHRP in FY 2005 totaled $33 million; in FY 2006, $32.7 million; in FY 2007, $36.5 million; in FY 2008, $36.7 million; in FY 2009, $37.5 million; and in FY 2010, an estimated $37.5 million is anticipated.

AASHTO considered 124 new problem statements submitted by states, AASHTO committees, and FHWA for the FY 2010 program. The quantity

Susan Martinovich
Chair
AASHTO Standing Committee on Research

Ann August
Chair
TCRP Oversight and Project Selection Committee

Cheryl A. Burke
Chair
HMCRP Technical Oversight Panel

Michael P. Huerta
Chair
NCFRP Oversight Committee

James A. Wilding
Chair
ACRP Oversight Committee

Christopher W. Jenks
Director
Cooperative Research Programs

Crawford F. Jencks
Deputy Director
Cooperative Research Programs

and quality of the requests ensure optimal use of the authorized funds. In September, AASHTO began to formulate the FY 2011 program and will determine the program content in March 2010.

NCHRP reports published during the past 12 months are listed on pages 66–67. A total of 294 projects were under contract as of September 1, 2009, with 92 additional projects under development or awaiting contract.

Each NCHRP study follows an approved research plan under the guidance of a panel of technical specialists and experienced practitioners. The panel defines the scope of work, selects the contractor under a competitive proposal process, and monitors the research from beginning to end. The panel's participation ensures the credibility of the research findings, facilitating adoption by AASHTO, state departments of transportation (DOTs), and other organizations.

The American Association of State Highway and Transportation Officials' Standing Committee on Research (SCOR) met in March to review the National Cooperative Highway Research Program (NCHRP) and to choose projects for FY 2010.

NCHRP panels convened for more than 120 project meetings in 2009; panel members contributed more than 2,460 days of volunteer time to attend meetings, plus a comparable amount of time to review materials. NCHRP benefits from nearly 2,750 volunteers who expend time and energy primarily for the challenges and the satisfaction of making significant contributions to the field.

Many NCHRP research projects have had a direct impact on practice through products such as recommended specifications, manuals, and guidelines. NCHRP emphasizes working with practitioners who will use the research results. Impacts on Practice, a new series of web postings, highlights successful applications of NCHRP research results and encourages use by others.[1]

The program's close relationship with AASHTO committees is important in achieving the goal of improving practice—approximately 66 percent of the research funds for new projects in FY 2010 are allocated to 20 projects requested by 9 AASHTO committees. Experience has shown that AASHTO committees are more likely to adopt NCHRP research results when (*a*) the committee identifies and requests the research, (*b*) committee members serve on the NCHRP project panel guiding the research, and (*c*) findings and recommendations are presented to the committee at the conclusion of the study. NCHRP projects frequently incorporate these three steps. The NCHRP web page includes a tally of products of direct interest to various AASHTO committees.[2]

Many NCHRP projects develop and recommend revisions to AASHTO publications at the request

[1] www.trb.org/NCHRP/NCHRPImpactsonPractice.aspx.

[2] www.trb.org/NCHRP/NCHRP.aspx.

of committees. When AASHTO adopts an NCHRP project's recommendations as a guide or specification, practitioners who may not be able to stay abreast of research results benefit from having the best information available through the AASHTO documents. General information on all projects is available in *NCHRP Summary of Progress, December 31, 2009* and on the web.[3]

NCHRP projects completed during the past year that were of particular importance to AASHTO are summarized in the following sections. All reports are available on the web.[4]

Administration and Management

The third in a triennial series of leadership forums convened April 19–21, under Project 20-24(67), State DOT CEO Leadership Forum 2009. Federal and state DOT leaders addressed the theme of state-driven, performance-based management. AASHTO has published a report on the discussions.

NCHRP Report 610, *Communication Matters: Communicating the Value of Transportation Research—Guidebook,* explores ways to integrate communications throughout the research process and introduces new approaches for communicating the value of research. The report examines good communications practices, the communication process, planning and evaluating communications efforts, and communicating with specific audiences, along with case studies.

NCHRP Report 636, *Tools to Aid State DOTs in Responding to Workforce Challenges*, examines tools that state DOT officials can use in recruiting, developing, and retaining a productive and effective workforce. NCHRP Report 623, *Identifying and Quantifying Rates of State Motor Fuel Tax Evasion*, presents an approach to determine evasion rates for state motor fuel taxes and to reduce differences between total fuel tax liability and actual tax collections.

NCHRP Web-Only Document 143, *Implementable Strategies for Shifting to Direct Usage-Based Charges for Transportation Funding,* presents and analyzes ways to implement direct charges to road users, based on vehicle-miles of travel (VMT), within the next 5 years. VMT fees can be an alternative or supplement to fuel taxes, which have been a principal mechanism for funding the transportation system.

Planning and the Environment

NCHRP Report 632, *An Asset-Management Framework for the Interstate Highway System,* establishes a framework for applying asset-management principles and practices to investments in the Interstate system. NCHRP Legal Research Digest 51, *Major Legal Issues for Highway Public–Private Partnerships,* explores legal issues that are likely to arise as public–private partnerships are implemented in the U.S. highway sector.

Design

NCHRP Report 612, *Safe and Aesthetic Design of Urban Roadside Treatments* reviews a toolbox of roadside treatments that address the safety and mobility of pedestrians, bicyclists, and motorists. NCHRP Report 625, *Procedures Guide for Right-of-Way Cost Estimation and Cost Management,* examines the practical and effective development of right-of-way (ROW) cost estimates and the tracking and managing of ROW cost during all phases of project development, including planning, programming, and preliminary and final design.

NCHRP Research Results Digest 337, *Design Flexibility Considerations for Built Urban Environments,* explores issues related to roadway design

NCHRP Report 612 reviews the design of roadside treatments addressing the safety and mobility of pedestrians, bicyclists, and motorists in urban areas. (Photo: Dan Burden)

[3] www.trb.org/NCHRP/NCHRP.aspx.

[4] www.trb.org/Publications/PubsNCHRPPublications.aspx.

Members of the NCHRP Project 9-49 panel meet to review their project, Performance of Warm-Mix Asphalt Technologies: Stage 1, Moisture Susceptibility.

exceptions or variances. The report also examines processes to manage exceptions and presents a timely procedure for addressing the issues.

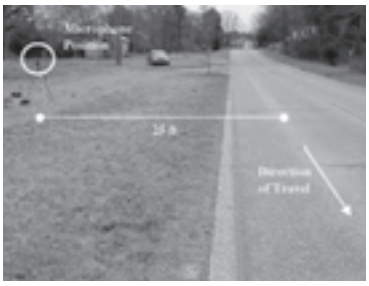
Materials

NCHRP Report 629, *Ruggedness Testing of the Dynamic Modulus and Flow Number Tests with the Simple Performance Tester*, examines the results of ruggedness testing and makes modifications to the equipment specification and test procedures for permanent deformation.

NCHRP Research Results Digest 328, *Color Effectiveness of Yellow Pavement Marking Materials*, explores the range of chromaticity coordinates that observers classify as yellow or white under daytime and incandescent illumination. The full report of the project was released as NCHRP Web-Only Document 125.

Pavements

NCHRP Report 630, *Measuring Tire–Pavement Noise at the Source*, examines the on-board sound intensity method for measuring tire–pavement noise.



Pass-by noise measurement setup for a portland cement concrete test site in Waverly, Alabama, from NCHRP Report 630, *Measuring Tire–Pavement Noise at the Source.*

Bridges and Other Structures

NCHRP Report 628, *Self-Consolidating Concrete for Precast, Prestressed Concrete Bridge Elements*, recommends guidelines and examines the selection of constituent materials for self-consolidating concrete, including mixture proportioning, testing methods, the properties of fresh and hardened concrete, and production and quality control.

Related reports in this topic area include

- NCHRP Report 611, *Seismic Analysis and Design of Retaining Walls, Buried Structures, Slopes, and Embankments;* and
- NCHRP Report 639, *Adhesive Anchors in Concrete Under Sustained Loading Conditions.*

Construction and Maintenance

NCHRP Report 627, *Traffic Safety Evaluation of Nighttime and Daytime Work Zones*, explores the crash rates for work zones and examines management practices that promote work zone safety and mobility. The report highlights work zone crash reporting, with suggestions to improve the data collected on work zone crashes.

NCHRP Report 637, *Guidelines for Dowel Alignment in Concrete Pavements*, examines the effects of dowel misalignment on concrete pavement performance and highlights measures for reducing misalignment and its adverse effects.

Other reports on construction and maintenance include

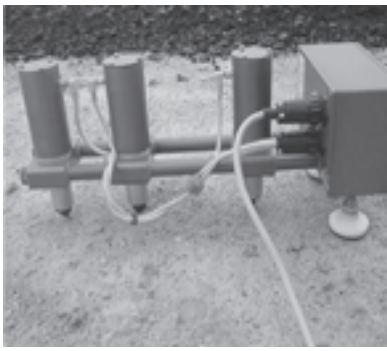
- NCHRP Report 626, *NDT Technology for Quality Assurance of HMA Pavement Construction*, and
- NCHRP Research Results Digest 335, *Performance Measures for Snow and Ice Control Operations.*

Traffic Operations and Safety

The NCHRP Report 500 series, Guidance for Implementation of the AASHTO Strategic Highway Safety Plan, released Volume 22, *A Guide for Addressing Collisions Involving Motorcycles*, and Volume 23, *A Guide for Reducing Speeding-Related Crashes.*

NCHRP Report 616, *Multimodal Level of Service Analysis for Urban Streets*, describes a method for assessing how well an urban street serves the needs of users. The multimodal level of service for an urban

Senior Program Officer Waseem Dekelbab updates an audience of standing committee chairs on NCHRP ongoing and recently completed bridge-related projects.



Seismic pavement analyzers are used in the nondestructive testing of different materials; findings appear in NCHRP Report 626, *NDT Technology for Quality Assurance of HMA Pavement Construction.*

street incorporates the automobile, bus, bicycle, and pedestrian levels of service, combining readily available data with data that agencies normally gather to assess the levels of service for automobiles and transit.

NCHRP Report 622, *Effectiveness of Behavioral Highway Safety Countermeasures,* explores a framework and provides guidance for estimating the costs and benefits of emerging, experimental, untried, or unproven behavioral countermeasures for highway safety.

NCHRP Research Results Digest 329, *Highway Safety Manual Data Needs Guide,* is a resource for users of the first edition of the *Highway Safety Manual,* to be published by AASHTO. The guide focuses on assembling and assessing the data necessary to apply the Part C safety prediction methodologies for rural two-lane highways, rural multilane highways, and urban and suburban arterials.

Senior Program Officer Stephan A. Parker displays the regularly updated list of TRB hazard and security activities during an Annual Meeting workshop on Bridge and Tunnel Security. The document is posted at http://onlinepubs.trb.org/Onlinepubs/dva/SecurityActivities.pdf.

Security

NCHRP Report 525, Volume 13, *A Guide to Traffic Control of Rural Roads in an Agricultural Emergency,* explores recommended practices and procedures and examines three levels of traffic control on local and state roads, based on the type of disease and the location of the control point.

NCHRP Report 525, Volume 14, *Security 101: A Physical Security Primer for Transportation Agencies,* provides transportation managers and employees with an introduction to security concepts, guidelines, definitions, and standards. The report focuses on physical security—measures designed to safeguard personnel; to prevent unauthorized access to equipment, installations, matériel, and documents; and to safeguard against espionage, sabotage, damage, and theft.

A thermal imaging photo, which can increase the value of video surveillance, from NCHRP Report 525, Volume 14, *Security 101: A Physical Security Primer for Transportation Agencies.*

NCHRP Report 525, Volume 15, *Costing Asset Protection: An All-Hazards Guide for Transportation Agencies (CAPTA),* is a planning tool for top-down estimation of the capital and operating budget implications of measures to reduce risks to locally acceptable levels. CAPTA supports an integrated, high-level, all-hazards, multimodal, consequence-driven risk management process that is responsive to the national incident management system and part of the mainstream of transportation agency programs and activities.

Continuing Projects

NCHRP supports several continuing projects with studies, some completed and some under way:

- Project 20-5, Synthesis of Information Related to Highway Problems, produces state-of-the-practice reports (see Studies and Special Programs Division section, page 37).
- Project 20-6, Legal Problems Arising out of Highway Programs, conducts reviews of case law and publishes the results in the NCHRP Legal Research Digest series.
- Project 20-30, NCHRP IDEA (Innovations Deserving Exploratory Analysis), funds projects to explore innovative concepts and to initiate product development (see Studies and Special

Programs Division section, page 38).

- Project 20-36, Highway Research and Technology—International Information Sharing, provides financial support for state DOT representatives to participate in foreign meetings and to host foreign experts in the United States. The project also shares expenses with FHWA for international scanning tours.
- Project 20-68, U.S. Domestic Scan Program, was adopted after a successful pilot test. Three or four domestic scans will be conducted annually.

TRANSIT COOPERATIVE RESEARCH PROGRAM

Authorized by the Intermodal Surface Transportation Efficiency Act and initiated under TRB management in July 1992, TCRP is supported by annual grants from FTA. The TCRP Oversight and Project Selection (TOPS) Committee chooses research for the program; the committee also serves as the board of directors of the Transit Development Corporation (TDC), a nonprofit educational and research affiliate of the American Public Transportation Association (APTA). A three-way memorandum of agreement by FTA, TDC, and TRB outlines the program's operating procedures. In its 17 years, TCRP has undertaken 564 studies; of these, 489 have been completed and 75 are in progress.

TCRP receives submissions of research problem statements throughout the year and has considered approximately 2,400 since 1992. In early 2009, TCRP issued a call for FY 2010 problem statements to more than 4,000 individuals and organizations in the transit community, emphasizing research consistent with FTA's Strategic Research Goals and the TCRP Strategic Plan. TCRP received and processed 100 problem statements for FY 2010.

TRB submits quarterly progress reports on TCRP to FTA, describing the work accomplished during the quarter and anticipated for the next period. Details of the program's progress since 1992 can be found in the 2009 TCRP Annual Report.

TCRP project oversight panels develop requests for proposals, select contractors, and monitor the research. In 2009, TCRP panels held a total of 57 meetings: 12 panel meetings to prepare research problem statements and to select research agencies; 35 interim project meetings to review project status at midcourse; and 10 meetings on special projects. These meetings involved approximately 450 professionals and represented more than 600 days of volunteer time. The TOPS Committee also met twice during the year.

At the TCRP Oversight and Project Selection (TOPS) Committee meeting in November, Vincent Valdes (*left*) and Therese McMillan, Federal Transit Administration; Keith Parker, VIA Metropolitan Transit and TOPS Vice Chair; Ann August, Santee Wateree Regional Transportation Authority and TOPS Chair; Christopher Jenks, CRP Director; and Robert E. Skinner, Jr., TRB Executive Director, participate in reviewing potential TCRP projects for FY 2010.

TCRP published 26 project reports in 2009 (see pages 67–68), bringing the total to 500 publications: 176 Reports, 80 Syntheses of Transit Practice, 92 Research Results Digests, 29 Legal Research Digests, 50 IDEA reports, 46 Web-Only Documents, and 27 CD-ROMs.

Research Dissemination

Dissemination of TCRP research results is a concerted activity. APTA administers TCRP Project J-1, Dissemination and Implementation of TCRP Research Findings, to distribute research materials to targeted audiences. This outreach includes various forms of promotion, as well as the Internet. APTA also disseminates TCRP information through *Passenger Transport*, the industry's weekly newspaper, as well as through announcements, press releases, and news reports.

APTA solicits research problem statements; conducts surveys; arranges for workshops, field visits, and training; and oversees other activities to ensure that public transportation industry practitioners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PASSENGER Transport

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The American Public Transportation Association disseminates TCRP information through the weekly newspaper, *Passenger Transport*.

receive and implement TCRP research results. The Conference of Minority Transportation Officials also distributes TCRP materials through the TCRP Ambassador Program, which maintains a roster of transit professionals who promote project findings to practitioners.

The J-1 Program has developed a TCRP dissemination website maintained by APTA; has distributed catalogs of publications on general and rural topics; has coordinated industry mailings and surveys to ascertain use and awareness of the program's products; and has produced informational CDs. TCRP reports are available online through APTA's TCRP dissemination website[5] and through TRB's TCRP web page.[6]

The following TCRP activities of particular interest were in progress or were completed during the year.

Transit Vehicles and Maintenance

TCRP Project E-6, Transit Bus Mechanics: Building for Success—The ASE Transit Bus Maintenance Certification Test Series, is developing tests for the Institute for Automotive Service Excellence (ASE) to certify transit bus mechanics. The tests are similar to those for the automotive, medium- and heavy-duty truck, and school bus industries. The project panel has identified 10 subject areas for testing.

In 2009, ASE administered nine transit bus tests—electrical and electronics; brakes; diesel engines; electronic diesel engine specialist; heating, ventilation, and air conditioning; transmission and drivetrain; suspension and steering; compressed natural gas engines; and preventive maintenance inspections. The compressed natural gas engines and preventive maintenance inspections tests were introduced this past spring. ASE offers the tests nationwide twice a year.

Subject-matter experts have started work on developing the final transit bus test—transit bus hybrid systems. The test is likely to be delayed, however, while the technologies develop and gain adoption, and the number of technicians eligible to take the test increases.

The ASE Board of Directors has approved a Transit Bus Master Technician designation for technicians who pass seven of the tests—electrical and electronics; brakes; diesel or compressed natural gas engines; heating, ventilation, and air conditioning; transmission and drivetrain; suspension and steering; and preventive maintenance inspections. The development of the test series has involved

Mechanics take a certification test at the Institute for Automotive Service Excellence (ASE). A TCRP project is developing ASE tests to certify transit bus mechanics. (Photo: ASE)

[5] www.tcrponline.org/index.cgi.

[6] www.trb.org/Publications/PubsTCRPPublications.aspx.

coordination with organized labor to ensure the availability of relevant training to develop the bus maintenance workforce.

TCRP Report 132, *Assessment of Hybrid-Electric Transit Bus Technology,* provides decision-making guidelines coupled with a comprehensive life-cycle cost model to assist transit managers in evaluating, selecting, and implementing hybrid-electric technology options for transit buses. The guidelines and the model incorporate site data and a comprehensive review of the capital requirements and the operating costs of hybrid-electric buses.

Major findings are that bus routes, characterized by average speed, have a profound effect on determining the cost advantage of hybrid buses. The model can be used to determine the threshold speed for which hybrid and conventional buses have equivalent life-cycle cost, based on fuel prices.

A train-activated warning sign in Los Angeles, from TCRP Synthesis 79, *Light Rail Vehicle Collisions with Vehicles at Signalized Intersections.*

Planning, Funding, and Project Delivery

TCRP Report 129, *Local and Regional Funding Mechanisms for Public Transportation,* with an accompanying database posted on the TRB website, provides an extensive list of funding sources that are in use or that may be used at the local and regional levels to support public transportation. The research identifies and defines six major categories of local and regional funding for public transportation but focuses on two: traditional tax- and fee-based funding sources and common business, activity, and related funding sources. The Local and Regional Funding Database provides an interactive, updatable repository of information from transit systems. The report includes guidance on evaluating funding mechanisms; criteria for selecting funding sources; and a description of international experiences.

TCRP Report 131, *A Guidebook for the Evaluation of Project Delivery Methods,* addresses major transit capital projects and evaluates the impacts, advantages, and disadvantages of including operations and maintenance in a contract for project delivery. The project delivery methods include design–bid–build, construction manager at risk, design–build, and design–build–operate–maintain. The guidebook offers a three-tiered project delivery selection framework to evaluate and select the most appropriate method for a project: a qualitative approach; a weighted-matrix approach; and an approach that uses the principles of risk analysis.

TCRP Synthesis 77, *Passenger Counting Systems,* describes the state of the practice for analytical tools and technologies for collecting transit ridership data and provides information from a survey of transit agencies about the effectiveness and reliability of automatic passenger counter systems. Six detailed case studies characterize best practices and highlight common problems in implementing automatic systems.

Operations and Safety

TCRP Report 135, *Controlling System Costs: Basic and Advanced Scheduling Manuals and Contemporary Issues in Transit Scheduling,* updates TCRP Report 30, *Transit Scheduling: Basic and Advanced Manuals*. The report provides information on scheduling tools, techniques, and capabilities and provides guidance on a variety of scheduling issues, including service running times, optimization of transfers, headway-interval scheduling, skip-stop and limited-stop operations, alternative work week structure, and operator relief techniques and relative costs.

TCRP Report 130, *Shared Use of Railroad Infrastructure with Noncompliant Public Transit Rail*

Vehicles: A Practitioner's Guide, presents a business case and a business model for the shared use of non-FRA-compliant public transit rail vehicles—such as light rail—with freight operations. The guide identifies the advantages and disadvantages of shared-use operations and the issues and barriers in implementation. A section identifies and evaluates available and emerging technology, operating procedures, and techniques to minimize the risks.

TCRP Synthesis 79, *Light Rail Vehicle Collisions with Vehicles at Signalized Intersections,* reports on methods to reduce collisions between light rail vehicles and motor vehicles when light rail transit (LRT) runs through—or adjacent to—highway intersections controlled by conventional traffic signals. The synthesis addresses issues and solutions for a range of LRT operations and environments, urban and suburban settings, and geographic regions.

TCRP Synthesis 80, *Transit Security Update,* addresses terrorism, as well as conventional crime, and covers counterterrorism and anticrime measures and practices, crime and security incident trends, and other related issues, including obstacles to security and policing management.

Rural Public Transportation

TCRP Report 136, *Rural Demand-Response Transportation: Guidebook for Measuring, Assessing, and Improving Performance,* defines rural demand-response transportation (DRT); identifies key performance data; presents a limited set of performance measures; describes the factors that influence DRT performance; assembles performance data from representative DRT systems; and presents policies, procedures, strategies, and practices to improve performance.

TCRP Research Results Digest 93, *Rural Transit Achievements: Assessing the Outcomes of Increased Funding for Rural Passenger Services Under SAFETEA-LU,* provides data and information on the changes in rural public and intercity bus transportation as a result of increased funding under SAFETEA-LU. The digest examines the growth in federal funding for passenger transportation in rural areas; improvements in services; the impact on local communities; and the barriers to development of new or expanded transit services in rural areas.

Transit Marketing

TCRP Report 133, *Practical Measures to Increase Transit Industry Advertising Revenues,* describes decision makers' perceptions about advertising on transit vehicles and includes a strategic, responsive communications plan and recommendations to improve those perceptions and increase transit revenue. The research team interviewed media planners, advertisers, and advertising sales contractors and identified the best strategies to increase transit's share of total advertising expenditures. A strategic communications plan addresses the target audience, key messages, tactics, metrics, public relations, positioning, timing, and sales tools for transit agencies of all sizes.

TCRP Report 134, *Transit Call Centers and 511,* provides a comprehensive review of the operational characteristics of 511 telephone traveler information systems and their interactions with transit system call centers. The report inventories 511 systems, documents the extent of transit participation and transit agency experience with 511, and presents guidance on determining a viable transit-511 strategy. Key findings reveal that few 511 systems include the basic transit content and features recommended by the national 511 Deployment Coalition and that, in most regions, even modest benefits justify participation. Benefits are most likely in environments with multiple transit providers and significant numbers of travelers who make day-to-day mode choice decisions.

Legal Research for Public Transportation Systems

TCRP Project J-5, Legal Aspects of Transit and Intermodal Transportation Programs, provides authoritatively researched, specific, limited-scope studies of legal issues and problems that have national significance and application to transit agencies. Two publications were released in 2009:

- TCRP Legal Research Digest 28, *Use of Fees or Alternatives to Fund Transit,* reviews the use of impact fees and other developer exactions for transit in the United States; the circumstances that have contributed to the development of transit impact fees; and the various strategies that states, municipalities, and transit systems have used to develop impact fees or other exactions to fund transit related to growth.

- TCRP Legal Research Digest 29, *First Amendment Implications for Transit Facilities: Speech, Advertising, and Loitering,* provides an analytical legal synthesis of regulations, statutes, policies, and case decisions about permissible and impermissible restrictions on speech and expressive behavior at transit facilities and aboard transit vehicles; sidewalks and transit facilities as public forums; attempts to regulate advertising on public property; and the enforcement of antiloitering and antipanhandling regulations on or near transit facilities.

Transit Lessons from Abroad

Since 1994, TCRP Project J-3, International Transit Studies Program, has sponsored 31 leadership development missions to expand the horizons of U.S. transit managers, and more than 400 professionals have participated in missions to Europe, Asia, Canada, South America, New Zealand, and Australia. The findings and observations of the participants are published in the TCRP Research Results Digest Series.[7]

AIRPORT COOPERATIVE RESEARCH PROGRAM

ACRP was authorized in the Vision 100: Century of Aviation Reauthorization Act, and a memorandum of agreement was signed in October 2005 to initiate the program. FAA sponsors ACRP, TRB manages the program, and representatives of airport operating agencies provide oversight and governance.

ACRP carries out applied research on problems shared by airport operating agencies but not adequately addressed in federal research programs. A 2003 study sponsored by FAA and published as TRB Special Report 272, *Airport Research Needs: Cooperative Solutions,* identified the need for ACRP. The program undertakes research and other technical activities in a variety of airport subject areas, including design, construction, maintenance, operations, safety, security, policy, planning, human resources, and administration.

The Vision 100 Act authorized $10 million per year for ACRP through FY 2008, and funding was increased to $15 million in FY 2009. To date, federal appropriations have included $3 million in FY 2005; $10 million in FY 2006, FY 2007, and FY 2008; and $15 million in FY 2009. Funding beyond FY 2009 is subject to the Vision 100 Act reauthorization, now under way; the expectation is that $15 million will be authorized and appropriated for FY 2010.

The ACRP Oversight Committee met to review projects in January.

The ACRP Oversight Committee (AOC), appointed by the U.S. Secretary of Transportation, met twice in 2009 and selected research projects for the FY 2010 program. To date, the AOC has authorized 166 projects totaling $46.6 million in a variety of subject areas of interest to the airport community.[8] The AOC will meet again in early 2010 to review progress.

In 2009, ACRP issued 35 publications (15 Reports, 5 Syntheses, 4 Research Results Digests, 3 Legal Research Digests, and 8 Web-Only Documents—see page 66).

More than 400 individuals from the airport community participate on ACRP project panels, which held approximately 80 meetings and 40 conference calls during 2009 to develop scopes of work, select research contractors, and review interim products. This volunteer assistance from project panel members ensures that the research and products are oriented to airport practitioners.

The following ACRP activities were in progress or were completed during the year.

[7] TCRP Research Results Digests 20, 22, 27, 31, 33, 36, 42, 47, 49, 53, 54, 58, 62, 64, 66, 68, 70, 71, 77, 81, 85, 88, 89, and 92.

[8] www.trb.org/Publications/PubsACRPPublications.aspx.

Airport Safety

ACRP Report 1, Volume 2, *Safety Management Systems for Airports, Volume 2: Guidebook,* is a comprehensive reference on airport safety management systems (SMS), with guidance and detailed information on planning, implementation, and operation. Safety risk management is a key component of an SMS—classifying potential airport risks according to the probabilities and the severity of the consequences, prioritizing the risks, and defining and continuously monitoring actions to mitigate the risks.

ACRP Report 12, *An Airport Guide for Regional Emergency Planning for CBRNE Events,* details hazard and threat assessments and airport emergency plans (AEPs) for responding thoroughly and accurately to significant incidents. The report also examines terrorist use of chemical, biological, radiological, nuclear, or explosive (CBRNE) materials in targeting airports, as well as the aid that would be summoned from beyond the immediate area. The report includes results of an airport survey on preparedness, along with highlights from selected AEPs.

ACRP Synthesis 15, *Identification of the Requirements and Training to Obtain Driving Privileges on Airfields,* reviews the differences and similarities in driving privileges at various airports throughout the country and describes the types of training programs available to airport employees to help prevent and reduce runway incursions.

ACRP Research Results Digest 6, *Guidance for Identifying and Mitigating Approach Lighting System Hazards,* provides tools for defining response procedures to hazards associated with aircraft and approach lighting systems. The digest includes a checklist of measures to reduce the identified hazards. The procedures also may be useful in mitigating hazards with other airport lighting systems, such as runway end identifier lights, and taxiway lights. The contractor's final report is available as ACRP Web-Only Document 4.

Airport Environmental Challenges

ACRP Report 11, *Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories,* provides a framework for identifying and quantifying components of airport contributions to greenhouse gas (GHG) emissions. This guidebook can be used to prepare an airport-specific inventory of emissions. The calculation methods can be applied consistently, improving comparability among airports and enhancing understanding of the relative contributions of GHGs to local environments. The methods focus on the six primary GHGs: carbon dioxide (CO_2), methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons. The guidebook includes instructions on how to calculate emissions from specific sources and how to create CO_2 equivalencies.

ACRP Report 14, *Deicing Planning Guidelines and Practices for Stormwater Management Systems,* is one of the first references on deicing operations. The guidelines describe practices for the cost-effective control of runoff from aircraft and airfield deicing and anti-icing operations. Fact sheets present overviews of practices, factors that affect applicability, the capital costs, and the operating and maintenance costs.

ACRP Report 15, *Aircraft Noise: A Toolkit for Managing Community Expectations,* presents ways to improve communications with the public about exposure to aircraft noise. The guidebook presents best practices for an effective communications program and assembles basic information about noise and its abatement to assist in responding to public inquiries. An accompanying CD-ROM contains a toolkit with examples of material successfully used to communicate about noise.

ACRP Synthesis 16, *Compilation of Noise Programs in Areas Outside DNL 65,* summarizes actions that airports take to address noise that exceeds the day–night average noise level (DNL) of 65, iden-

tified in federal policy as the "significant" level of cumulative aircraft noise. Through a survey of airports, the synthesis identifies a range of noise abatement, mitigation, and communication techniques to address noise outside DNL 65.

ACRP Synthesis 17, *Approaches to Integrating Airport Development and Federal Environmental Review Processes,* describes practices used by airports and FAA to integrate the environmental review and airport project development processes. The synthesis assembles techniques to involve environmental activities at each stage of airport project development and identifies time- and cost-effective practices and approaches.

Airport Planning and Project Delivery

Volume 1 of ACRP Report 17, *Airports and the Newest Generation of General Aviation Aircraft,* forecasts fleet activity, with 2007 as the baseline, and generates 5- and 10-year fleet size projections. Activity projections also are provided for very light jets in commercial air taxi services at more than 1,800 U.S. airports. Volume 2 serves as a guidebook for assessing the practical requirements and innovative approaches to accommodate these new aircraft.

ACRP Report 21, *A Guidebook for Selecting Airport Capital Project Delivery Methods,* describes project delivery methods and evaluates the impacts, advantages, and disadvantages of various project delivery systems: design–bid–build, construction manager at risk, design–build, and design–build–operate–maintain. The guidebook offers a two-tiered project delivery selection framework: an analytical delivery decision approach and a weighted matrix delivery decision approach. A companion publication, ACRP Web-Only Document 6, *Evaluation and Selection of Airport Capital Project Delivery Methods,* reviews the literature and research findings related to various project delivery methods for airports, describes the methods, and reviews the selection approaches commonly used by airports.

ACRP Report 23, *Airport Passenger-Related Processing Rates Guidebook,* provides user-friendly guidance on collecting accurate passenger-related processing data for evaluating facility requirements and efficient, cost-effective airport terminal designs. The dynamic nature of the airport industry necessitates an understanding of rapidly changing passenger characteristics, processing technologies, and security protocols that affect terminal development.

ACRP Report 24, *A Guidebook for Evaluating Airport Parking Strategies and Supporting Technologies,* presents parking strategies and technologies that are employed at airports in the United States or that have potential applications. The guidebook assists in determining parking goals and customer needs; understanding the strategies and technologies appropriate to the goals; and evaluating benefits, costs, and implementation to improve customer service, increase operational efficiency, and enhance net revenues.

ACRP Report 26, *Airport User Survey Methodology,* reviews the planning, design, conduct, and analysis of surveys of airport users. The guide covers surveying and sampling methods, testing, interviewer selection and training, and survey logistics, as well as the latest technology, such as electronic data collection devices. The guide notes that the survey method and sampling plan depend on the target group of users, the types of information to be collected, airport-related factors, the experience of the survey team, and budgetary considerations.

ACRP Report 27, *Enhancing Airport Land Use Compatibility,* provides information and tools to protect airports and local governments from incompatible land uses that could impair airport and aircraft operations and safety and eventually constrain airport development. The report defines compatible land uses, offers techniques to address land use issues around airports, defines the roles and responsibilities of stakeholders, summarizes related federal legislation and regulations, and reviews 15 case studies. Tools include sample airport land use compatibility model state legislation, a model local zoning ordinance, a sample navigation and noise easement, and a sample disclosure statement to real estate buyers.

A new ACRP Report assembles comprehensive and practical information about surveys of airport users. (Photo: David Benbennick, Wikimedia Commons)

ACRP Synthesis 13, *Effective Practices for Preparing Airport Improvement Program Benefit–Cost Analysis,* describes successful assessment techniques for performing benefit–cost analyses (BCAs) for hard-to-quantify benefits from projects that require

ACRP Report 16, *Guidebook for Managing Small Airports,* provides direction to managers of small airports. (Photo: Chisholm-Hibbing Airport Authority)

more than $5 million in Airport Improvement Program discretionary funding. The synthesis summarizes the literature, describes techniques for preparing BCAs, and presents six case studies.

ACRP Synthesis 14, *Airport System Planning Practices,* documents the results from surveys of state aviation agencies and regional planning organizations about their involvement in airport system planning, the types of studies they perform, and their success in meeting the objectives.

Small Airports

ACRP Report 16, *Guidebook for Managing Small Airports,* introduces the critically important issues that practitioners—owners, operators, managers, and policy makers—face at small airports as managers. The guidebook presents practical resources and references to address and resolve the issues.

ACRP Report 18, *Passenger Air Service Development Techniques,* provides information on the air service development (ASD) tools and programs that smaller communities have used, including minimum revenue guarantees, cost subsidies, marketing and advertising, and in-kind contributions, among others. The first section discusses the context for ASD, particularly the financial condition of the U.S. aviation industry and the competitive challenges that small communities face in retaining or enhancing commercial air service. The second section looks at how communities can address the challenges and develop and execute an ASD program.

Airport Human Resources

ACRP Report 22, *Helping Airport and Air Carrier Employees Cope with Traumatic Events,* is a resource manual for addressing the difficult emotional and psychological implications from response and exposure to traumatic events—such as accidents, acts of terrorism, or natural disasters—in the vicinity of an airport or resulting from the operation of an air carrier. The manual assists in developing plans for mitigating the emotional impacts of traumatic events and in preparing responders to understand and recognize the symptoms and signs of those affected and to develop their own resilience to overcome the trauma.

Legal Aspects of Airport Programs

ACRP Project 11-01, *Legal Aspects of Airport Programs,* provides authoritatively researched, specific, limited-scope studies of legal issues and problems of national significance and application to airports. During 2009, the results of three research topics were published:

- ACRP Legal Research Digest 5, *Responsibility for Implementation and Enforcement of Airport Land Use Zoning Restrictions,* examines federal, state, and local laws and regulations about aviation land use and zoning and identifies the legal bodies primarily responsible for communication and enforcement.
- ACRP Legal Research Digest 6, *The Impact of Airline Bankruptcies on Airports,* identifies the legal issues presented by the filing of airline bankruptcies and explores the response of airport lawyers and courts. The digest explains the basics of bankruptcy theory and law in relation to airport

operating agreements with airlines and reviews issues—such as lease recharacterization and payment of stub-period rent—that affect airports dealing with airlines in bankruptcy.

- ACRP Legal Research Digest 7, *Airport Governance and Ownership,* addresses the issue of essential powers to operate an airport; defines what airport governance includes; describes the advantages and disadvantages of the governance structures; identifies and analyzes projects that have transferred airports from one form of governance to another; and determines the legal problems encountered during the transfers.

The National Cooperative Freight Research Program Oversight Committee hears about current research projects at a meeting on October 1.

NATIONAL COOPERATIVE FREIGHT RESEARCH PROGRAM

NCFRP was authorized in 2005 under the SAFETEA-LU legislation. NCFRP is sponsored by RITA and managed by TRB, with program guidance provided by an oversight committee comprising a representative cross-section of freight stakeholders. On September 6, 2006, RITA and the National Academies executed a contract to begin work. The total available funds in FY 2006 were $2.65 million; in FY 2007, $2.9 million; in FY 2008, $2.93 million; in FY 2009, $3.9 million; and in FY 2010, an estimated $3.4 million is anticipated.

NCFRP conducts applied research on freight industry problems that are not being adequately addressed by other research programs. The NCFRP strategic plan has five objectives:

1. **Analyze the business of freight transportation.** Trends in the global and national movement of freight and business logistics are likely to place greater demands on the nation's freight transportation system. NCFRP research will improve information and provide clearer insight into the market-driven factors that lead and respond to current and future freight demand.

2. **Develop reliable data and tools for the analysis of freight transportation.** Successful decision making depends on credible and reliable analysis, which requires high-quality data. NCFRP research will identify improvements in collecting, analyzing, and using data and will develop tools for analyzing and managing the economic, safety, security, environmental, health, energy, and community impacts of freight transportation decisions.

3. **Explore operational improvements for freight transportation.** Enhancing the system performance should not focus only on providing new infrastructure but should include operational strategies and more efficient management of capacity. NCFRP research will provide guidance on implementing improvements in operational and system management.

4. **Evaluate investment decisions for adding physical capacity to the freight transportation system.** Quantifying benefits—including the return on the investment—is a key input for decision making. NCFRP research will provide information and guidance on making sound decisions for adding capacity when the investment makes economic sense.

5. **Identify ways to strengthen the institutional framework for the freight transportation system.** Institutional capacity is often a prerequisite for successful planning and implementation of freight-oriented strategies. NCFRP research will identify institutional barriers, organizational capacity issues, and innovative solutions to freight transportation challenges. Of particular interest is the evolving concept of public–private partnerships that often does not conform to jurisdictional boundaries or to the traditional dividing line between government and business.

The Freight Research Oversight Committee met in November 2008 to select projects for the FY 2009 program and chose 10 new projects—including two jointly funded by NCHRP—and approved the continuation of a project. During 2009, technical panels were formed, requests for proposals were

(*From left*:) George Famini, Bill Rogers, Barbara Windsor, William L. Reese, Randolph Martin, Crawford Jencks, Charles H. Hochman, Cheryl Burke, and Christopher Jenks listen to a briefing at a meeting of the Hazardous Materials Cooperative Research Program Technical Oversight Panel, October 13.

posted, contractors were selected, and research contracts were executed.

The Oversight Committee met again in October 2009 to select the FY 2010 program. Panels are being formed and are starting to write requests for proposals.

After 3 years of activity, several projects are coming to a conclusion. The results of two projects were published this year:[9]

- NCFRP Report 1, *Public- and Private-Sector Interdependence in Freight Transportation Markets*, is a primer to provide public agencies with a basic understanding of decision making in the private sector and of the interdependence between public and private decision making in freight transportation.
- NCFRP Report 2, *Institutional Arrangements in the Freight Transportation System*, describes successful and promising institutional arrangements for improving freight movement.

HAZARDOUS MATERIALS COOPERATIVE RESEARCH PROGRAM

SAFETEA-LU authorized a pilot cooperative research program on hazardous materials transportation. HMCRP is sponsored by PHMSA, and a contract to begin work on the pilot went into effect in September 2006. HMCRP complements other U.S. DOT research programs as a stakeholder-driven, problem-solving program, funding research on real-world, day-to-day operational issues with near-term to midterm time frames. The total available funding in FY 2006 was $0.88 million; in FY 2007, $0.97 million; in FY 2008, $0.98 million; and in FY 2009, approximately $1.28 million. In FY 2010, an estimated $1.1 million is anticipated.

The Hazardous Materials Technical Oversight Panel met in December 2008 to select projects and chose three new projects for the FY 2009 program. Technical panels were formed, requests for proposals were posted, contractors were selected, and contracts were initiated.

The Oversight Panel met again in October 2009 to select the FY 2010 program of projects. Panels are being formed and are starting to write requests for proposals.

Several projects are coming to a conclusion, and one has been published as HMCRP Report 1, *Hazardous Materials Transportation Incident Data for Root Cause Analysis*.[10]

STAFF NEWS

Eileen P. Delaney, CRP Director of Publications, received an individual distinguished service award from the National Academies in October.

Ellen M. Chafee was promoted to Editor in March.

Joseph D. Navarrete joined the ACRP staff in September as a Senior Program Officer.

Joining the CRP staff were Senior Program Assistants **Rachel J. Kirkland**, in January; **Tiana M. Barnes**, in May; **Melanie J. Adcock**, in November; and Program Assistant **Stephanie L. Campbell**, in February.

Charles Douglas English joined the CRP staff as an Editor in August.

[9] www.trb.org/Publications/Public/PubsNCFRPProjectReports.aspx.

[10] www.trb.org/Publications/PubsHMCRPPublications.aspx.

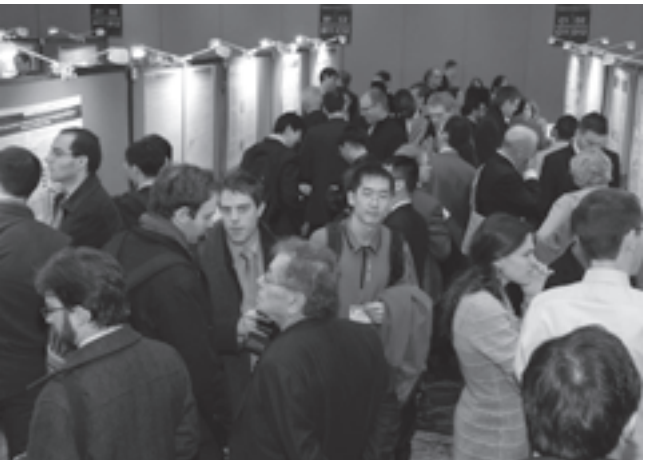
STRATEGIC HIGHWAY RESEARCH PROGRAM

SHRP 2

CONGRESS AUTHORIZED THE SECOND Strategic Highway Research Program (SHRP 2) in August 2005 to investigate the underlying causes of high traffic fatality rates and of intensified congestion and to find methods for rapidly renewing the nation's aging transportation infrastructure without contributing to traffic fatalities or congestion. To meet this charge, SHRP 2 has developed research plans in four integrated focus areas to

- Reduce crash risk,
- Identify and develop innovative methods for rapid highway renewal,
- Improve highway and transportation planning through collaborative decision making, and
- Address the causes of congestion and delay.

Roughly halfway into the expected 7-year life span of the program, nearly 20 percent of the planned research projects in SHRP 2 are complete and about 60 percent are active. As of December 2009, SHRP 2 had committed more than $97 million to 65 research projects in its four focus areas.



A combined poster session at the 2009 Annual Meeting showcased the SHRP 2 Capacity and Reliability projects in progress, attracting a large audience to the researchers' reports.

Kirk T. Steudle
Chair
SHRP 2 Oversight Committee

Neil F. Hawks
Director
SHRP 2

Ann M. Brach
Deputy Director
SHRP 2

The first four research reports of the program are available on the TRB website. A report from the Capacity focus area describes a framework for performance measurement, one of the tools to be integrated into the overarching collaborative decision-making framework. The other three reports are from the Renewal focus area—two address the challenges related to underground utilities, and the other explores a variety of nondestructive testing procedures.

Progress in each focus area is described briefly in the following sections. Also highlighted are program outreach activities—including international conferences—and the fourth SHRP 2 Safety Symposium. Detailed project information is available on the SHRP 2 website.[1]

FOCUS AREAS

Safety

Safety research in SHRP 2 will apply advanced technologies to understand how drivers interact with and adapt to a variety of factors—the vehicle, the traffic, the roadway characteristics, the traffic control devices, and the environment—and to

[1] www.trb.org/StrategicHighwayResearchProgram2SHRP2/Public/Blank2.aspx.

Video data from equipment installed in the vehicles of approximately 3,000 volunteer drivers will be collected over a 2-year period in the SHRP 2 naturalistic driving study.

assess the changes in collision risk associated with each factor.

Continuous collection of a vast array of data will support a study of the entire driving process, including near-collisions, critical incidents, traffic conflicts, and event-free driving. The goal is to measure crash risk factors and to develop surrogate measures for specific traffic maneuvers.

The study of driving behavior will gather data through a sophisticated instrumentation package installed in the vehicles of approximately 3,000 volunteer drivers over a 2-year period. Six sites were selected for the $26 million naturalistic study of driving behavior, and data collection will begin in 2010.

SHRP 2 is sponsoring development of a roadside video system to record the movement of all vehicles at each site. Seven safety projects are complete, four are active, and at least three others are anticipated during the course of the program.

Renewal

SHRP 2 renewal research aims at developing advanced approaches to renew highways and to ensure their durability with rapid and minimally disruptive techniques. The task involves identifying and developing materials and methods for design, construction, and inspection that reduce life-cycle costs, extend useful life, improve constructability, and decrease the time spent on onsite construction.

The renewal research plan supports the goal to "get in, get out, and stay out" by addressing such strategies as prefabrication, modular construction, standardized components, and roll-in technologies for bridges and pavements. Five projects are complete and 23 are active. These projects fully commit the available funds for renewal research. Research reports are available for two projects that address utility issues (Projects R01 and R15) and one that explores nondestructive testing procedures (R06).

Reliability

SHRP 2 reliability research investigates the root causes of uncertain travel times by focusing on highway system operations. Travelers and shippers value reliable travel times, which can be compromised by unexpected, nonrecurring congestion. By

Bridge construction in Utah deploys self-propelled modular transporters, an innovative technique examined in SHRP 2 renewal research. (Photo: Utah Department of Transportation)

Emergency responders participate in a role-playing exercise designed to provide practical insights on clearing incidents faster through close coordination of on-scene tasks.
SHRP 2 reliability research will help to identify, integrate, and implement operations strategies.

reducing nonrecurring congestion, transportation agencies can make significant gains in assuring reliability, even as travel demand grows.

Reliability research projects will identify effective operations strategies; will improve the means of integrating operations activities into planning, modeling, and decision making; and will assist in implementing operations strategies. Two reliability projects are complete, 10 are active, and another 6 are anticipated. Research reports will be available soon. In January 2010, TRB's Innovations Deserving Exploratory Analysis (IDEA) program will initiate Reliability IDEA to encourage innovation by funding early-stage investigations of concepts to advance reliable highway travel times.

Capacity

Capacity research within SHRP 2 is developing approaches and tools for systematically integrating environmental, economic, and community requirements into the analysis, planning, and design of new highway capacity. At the core of the research program is a web-based framework for collaborative decision making to improve solutions to capacity problems. This interactive web tool is under construction and will be pilot-tested in an upcoming project.

Supporting the framework are projects that focus on system-based performance measures, the regional economic impact of new highway capacity, ways to incorporate the capacity gains from highway management into the planning process, and the effects of congestion and pricing on the behavior of highway users. Results and insights from the early projects will contribute to the development of tools that target the most critical barriers to success.

The final report for Project C02, which developed the performance measurement framework to support collaborative decision making, is available on the TRB website and through the online bookstore. Twelve capacity projects are currently active and seven additional projects are included in the research plan.

BUILDING FRAMEWORKS

The report to Congress on SHRP 2 implementation—TRB Special Report 296, *Implementing the Results of the Second Strategic Highway Research Program: Saving Lives, Reducing Congestion, Improving Quality of Life*—was released in January 2009. The report explores promising results expected from SHRP 2 research and makes recommendations for the effective implementation of the results.

According to the committee that developed the report, the widespread implementation of products developed by SHRP 2 is critical for addressing the nation's roadway safety, renewal, reliability, and capacity issues. To move the research results into practice when the implementation phase begins, SHRP 2 has started constructing collaborative frameworks with other organizations. For example, several members of organizations in Canada, the

SHRP 2 Director Neil F. Hawks updates the TRB Executive Committee on progress of the SHRP 2 program.

International updates were shared at the SHRP 2 Safety Symposium by (*left to right:*) Wu Hongbo, China; Fred Wegman, SWOV, the Netherlands; Derek Sweet, SHRP 2; Tom Dingus, Virginia Tech Transportation Institute; Trent Victor, Volvo; and Jim Sayer, University of Michigan Transportation Institute.

Netherlands, and Israel have participated in SHRP 2 committees and expert task groups.

In May, the Federal Highway Administration (FHWA) designated Mary Huie of the Highways for LIFE program to coordinate its involvement in SHRP 2 Renewal implementation. Huie works onsite in the SHRP 2 office several times a month, advising staff about FHWA-related activities and keeping current on SHRP 2 progress.

The fourth SHRP 2 Safety Symposium convened in July in Washington, D.C., drawing more than 100 members of the international highway safety community, including participants from Canada, the Netherlands, Sweden, South Africa, and China. Presentations covered such topics as naturalistic driving studies and international data sharing.

In October, SHRP 2 and the Joint Transport Research Centre of the Organisation for Economic Co-Operation and Development and the International Transport Forum cohosted the International Meeting on Values of Travel Time Reliability and Cost–Benefit Analysis in Vancouver, British Columbia, Canada. The meeting examined recent research results on the measurement and valuation of travel time reliability, including national experiences, and explored successful practices in integrating reliability into cost–benefit analyses.

PARTNERSHIP OPPORTUNITIES

As methods and technologies emerge from SHRP 2 research projects, opportunities will arise for transportation agencies to participate in evaluations and trials of the proposed solutions for transportation problems. For example, host sites are needed for a fall 2010 demonstration project developing standardized approaches to designing, constructing, and reusing complete bridge systems. Another project will provide funding for a state department of transportation or other agency to pilot-test an ecological approach and business model for environmental protection, developed under the Capacity focus area. The SHRP 2 web page includes descriptions of these and other partnership opportunities.

Rijkswaterstaat, the Dutch DOT, is supporting SHRP 2 with the loan of staff member Hans Van Saan (*second from left*), who with Director Hawks briefs Bob Randsdorp and Monique Van Raamsdonk, attending the TRB Annual Meeting from Rijkswaterstaat.

STAFF NEWS

In January, **Michael Miller** took the position of Senior Program Assistant in the Capacity focus area.

Dean Trackman joined the staff in August as Managing Editor for SHRP 2 publications.

ADMINISTRATION AND FINANCE

THE TRB ADMINISTRATION AND FINANCE Division provides financial, technological, and administrative support for the work of TRB staff; financial oversight of the contracts and grants related to TRB activities; expenditure controls; administration of publications sales and distribution; maintenance of the benefits and services for sponsor and affiliate organizations; and liaison to the administrative and financial offices of the National Academies.

FINANCIAL MANAGEMENT

The division manages the contracts and grants that support TRB's work, prepares budgets for continuing operations and individual projects, and controls expenditures. TRB's total income and expenditures have increased consistently each year to nearly $100 million (see bar chart at right). A statement of income and expenditures is provided on pages 60–61.

AFFILIATE AND SPONSOR SERVICES

TRB's core programs have five main levels of support: student affiliates, individual affiliates, organizational affiliates, sustaining affiliates, and sponsors. All affiliates and sponsors contribute to the support of TRB activities through annual fees based on the level of services selected.

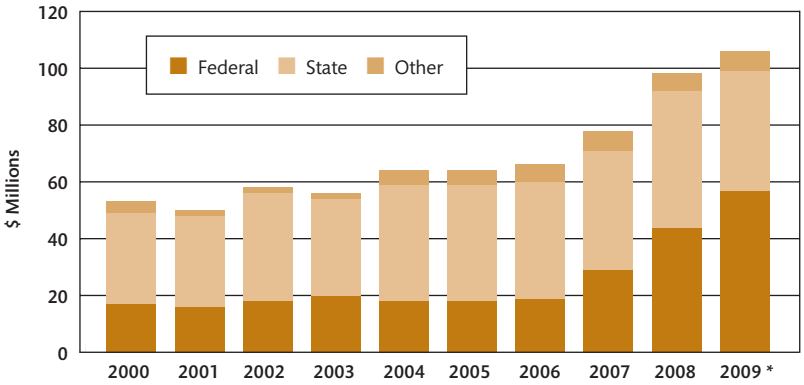
A student registers at the Annual Meeting; student affiliates receive a special rate for TRB affiliate benefits, such as reduced Annual Meeting registration fees, use of the TRB library, and more.

Individual and student affiliates' benefits include reduced registration fees for the TRB Annual Meeting; a complimentary subscription to *TR News;* discounts on most TRB books and reports—including access to the new TRR Online, the web posting of papers from TRB's journal; use of the TRB library; and assistance with TRB computer-based information services. Individual and student affiliates also may subscribe to publications at a substantially reduced rate through a selective distribution program.

Organizational affiliates include government agencies, academic organizations, private organizations, and consultants committed to the advancement of knowledge about the nature and performance of transportation systems and system components. In addition to the range of benefits that individual affiliates receive, organizational affiliates obtain most publications at no cost and complimentary registrations—as well as marketing and exhibit opportunities—at the TRB Annual

(continued on page 62)

TRB Activity Level by Year



* Calendar Year 2009 data use actual data for the first three quarters and an estimate for the fourth quarter.

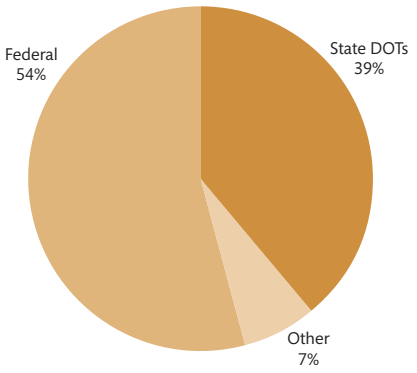
Michael P. LaPlante
Director
Finance and Business Operations

STATEMENT OF ACTIVITIES

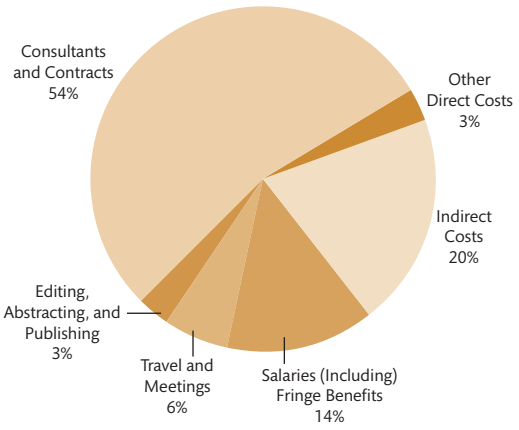
Funding Support by Program and Expenditures
Calendar Years 2008 and 2009

	2008 (Actual)	2009 (Projected)*
Core Technical Activities		
State Highway and Transportation Departments (State DOTs)	$7,400,000	$7,400,000
Federal Government		
Federal Highway Administration (FHWA)	1,632,000	2,300,000
Research and Innovative Technology Administration	300,000	300,000
Federal Transit Administration (FTA)	200,000	200,000
National Highway Traffic Safety Administration	198,000	198,000
Bureau of Indian Affairs	80,000	80,000
Federal Motor Carrier Safety Administration (FMCSA)	70,000	75,000
U.S. Army Corps of Engineers	60,000	65,000
Federal Railroad Administration (FRA)	60,000	65,000
Federal Aviation Administration (FAA)	60,000	60,000
Subtotal, Federal Government	$2,660,000	$3,343,000
Other		
Association of American Railroads	60,000	65,000
American Transportation Research Institute	60,000	65,000
American Public Transportation Association	60,000	65,000
Fees and Sales	4,489,586	4,500,000
Subtotal, Other	$4,669,586	$4,695,000
Total, Core Technical Activities	**$14,729,586**	**$15,438,000**
Marine Board Core Program		
U.S. Coast Guard	100,000	100,000
U.S. Army Corps of Engineers	30,000	30,000
Maritime Administration	15,000	10,000
Minerals Management Service	30,000	30,000
U.S. Navy	25,000	0
Office of Naval Research	40,000	0
National Oceanic and Atmospheric Administration	30,000	30,000
Total, Marine Board Core Program	**$270,000**	**$200,000**
Cooperative Research Programs		
National Cooperative Highway Research Program (State DOTs)	33,169,454	28,113,283
Transit Cooperative Research Program (FTA)	6,101,931	7,762,283
Airport Cooperative Research Program (FAA)	9,708,671	10,844,318
HazMat Cooperative Research Program (Pipeline and Hazardous Materials Safety Administration)	734,634	930,611
Freight Cooperative Research Program (FMCSA)	1,383,459	3,101,974
Total, Cooperative Research Programs	**$51,098,149**	**$50,752,470**

TRB Funding Support



Distribution of TRB Expenditures



	2008 (Actual)	2009 (Projected)*
Strategic Highway Research Program 2	**$13,815,538**	**$20,500,875**
Continuing Programs		
Pavement Research Program Review (FHWA)	$266,997	$238,159
Research and Technology Coordinating Committee (FHWA)	169,984	114,529
Innovations Deserving Exploratory Analysis (IDEA)		
NCHRP IDEA (State DOTs)	1,107,404	1,111,586
Intelligent Transportation System/High-Speed Rail IDEA (FRA)	318,323	137,037
Transit IDEA (FTA)	466,196	447,239
Safety IDEA (FRA and FMCSA)	181,757	205,917
Subtotal, IDEA Program	$2,073,680	$1,901,779
Synthesis Programs		
NCHRP Synthesis (State DOTs)	1,371,201	1,132,869
TCRP Synthesis (FTA)	528,165	473,298
Commercial Truck and Bus Safety Synthesis (FMCSA)	103,045	298,343
ACRP Synthesis (FAA)	514,409	418,477
Subtotal, Synthesis Programs	$2,516,820	$2,322,987
Legal Programs		
NCHRP Legal (State DOTs)	222,497	144,161
TCRP Legal (FTA)	180,548	179,998
ACRP Legal (FAA)	276,933	278,000
Subtotal, Legal Programs	$679,978	$602,159
Total, Continuing Programs	**$5,707,459**	**$5,179,613**
Policy Studies	**$2,298,141**	**$2,197,331**
Conferences and Workshops	**$2,421,577**	**$2,271,279**
TRB TOTAL	**$90,340,450**	**$96,539,569**
Sources of Funds		
Federal	40,614,984	52,257,698
State DOTs	43,270,556	37,901,899
Other	6,454,911	6,379,973
	$90,340,451	**$96,539,570**
Expenditures by Major Cost Category		
Salaries (including fringe benefits)	$12,743,621	$13,218,248
Travel and Meetings	4,866,000	5,311,125
Editing, Abstracting, and Publishing	2,639,442	2,482,762
Consultants and Contracts	48,714,516	51,867,003
Other Direct Costs	2,288,206	2,398,674
Indirect Costs	18,046,435	19,453,174
Total Expenditures	**$89,298,220**	**$94,730,987**

TRB Reserve Fund		
Fund balance, end of previous fiscal year	**$7,368,074**	**$8,410,305**
Plus (minus) current fiscal year income over (under) expenditures	**1,042,231**	**1,808,583**
Balance, current fiscal year	**$8,410,305**	**$10,218,888**

In 1965, the TRB Executive Committee approved a reserve fund to provide for orderly adjustments in the event of a temporary shortfall in anticipated revenues for TRB Technical Activities. This fund, built up over the years from surplus income in excess of expenditures from nonfederal sources for any one fiscal year, is reserved for expenditures in excess of income for any later fiscal year under a fixed budget approved triennially by the TRB Executive Committee.

* Calendar Year 2009 data use actual data for the first three quarters and an estimate for the fourth quarter.

Customer Service Representative Cydni Johnson inventories titles for TRB publication sales and distribution, which have an international scope.

(continued from page 59)

Meeting. Organizational affiliate contributions range from $4,300 to $10,500, depending on the level of benefits selected.

Sustaining affiliates are agencies and organizations—including individual corporations and businesses—that support TRB at a level considerably higher than the direct cost of all of the services and publications received. The minimum annual contribution is $15,000.

Sponsors are the major source of financial support for TRB's core programs. Federal, state, and local government agencies and professional societies and organizations that represent industry groups are eligible to be TRB sponsors. Fees and services are negotiated to serve each sponsor's needs and to provide fundamental support for the Board's programs and activities of interest to the entire transportation community. The minimum annual sponsor fee is $65,000. Sponsors are represented on the TRB Executive Committee. (See pages 69–70 for a list of TRB sponsors and sustaining affiliates.)

The new look of TRB's website, http://TRB.org, was unveiled in July.

PUBLICATION SALES AND DISTRIBUTION

TRB's timely distribution of publications disseminates the results of transportation research and technology worldwide. TRB also releases selected publications—some exclusively—in electronic format. A list of TRB publications issued from January 1 through December 31, 2009, appears on pages 65–68.

WEB AND STRATEGIC APPLICATIONS

The TRB Information Technology (IT) unit develops and supports many of the applications used by TRB's program divisions and is the liaison for computer network infrastructure to the Information Technology Services office of the National Academies.

In 2009, TRB redesigned, reorganized, and relaunched its website at http://TRB.org. The new website, dynamically driven by a content management system (CMS), has replaced the previously static web pages that fell out of date quickly.

The CMS clusters transportation information by topic and by mode and creates consistency in the organization of information on the website. The system improves the ability of website visitors to find the information they want, quickly and efficiently. New features include RSS (really simple syndication) feed capability, to issue immediate updates on specific topics to interested readers; and connections to social networking sites, such as Twitter and Facebook. The website soon will allow visitors to create individualized "My TRB" pages.

STAFF NEWS

Kwame A. Obeng was promoted to Senior Accounting–Financial Assistant.

Joining the staff as Accounting–Financial Assistants were **Tameka S. Covert** and **Eduardo N. Cusicanqui**.

Martina C. Duvernay came on board as Office Assistant for Publication Sales and Affiliate Services.

TRB CONFERENCES AND WORKSHOPS

JANUARY 1, 2009–DECEMBER 31, 2009

January

11–15	TRB 88th Annual Meeting

February

9–12	1st International Conference on Transportation Construction Management*

March

24–25	Midwest Traffic Monitoring Workshop

April

1–3	Design–Build in Transportation Conference
7–8	Workshop on Polyphosphoric Acid Modification of Asphalt Binders*
15–17	Workshop on Identifying Traveler Information Research Needs to Achieve All Roads, All Modes, All the Time
19–22	11th Joint Light Rail Transit Conference*
21–23	Strategic Highway Safety Plan and State DOT Safety Engineer Peer Exchanges
22–24	National Conference on Preservation, Repair, and Rehabilitation of Concrete Pavements*
22–24	Teamwork in U.S. Railroad Operations
22–24	Strategic Highway Safety Plan Peer Exchange

May

3–5	7th National Aviation System Planning Symposium
4–6	4th Bus Rapid Transit Conference*
4–6	34th Annual Ports, Waterways, Freight, and International Trade Conference
12–14	19th Biennial Visibility Symposium
17–21	12th National Transportation Planning Applications Conference
27–29	11th Annual Harbor Safety Committee Conference*

June

2–3	Data and Tools for Linking Goods Movement, Air Quality, and Transportation Infrastructure Decisions Workshop
14–17	26th International Bridge Conference*
21–24	2nd International Symposium on Freeway and Tollway Operations*
22–24	North American Transportation Statistics Interchange
22–26	5th International Driving Symposium on Human Factors in Driver Assessment, Training, and Vehicle Design*
28–July 1	Earthquake Engineering in a Multihazard Environment*
29–July 2	8th International Conference on the Bearing Capacity of Roads, Roadways, and Airfields*

July

8–10	6th International Conference on Maintenance and Rehabilitation of Pavements and Technological Control*
19–22	48th Annual Workshop on Transportation Law
19–22	2009 TRB Joint Summer Conference
19–23	12th AASHTO–TRB Maintenance Management Conference*
22	Northwest Traffic Data Workshop
28–29	2009 Transportation Planning, Land Use, and Air Quality Conference

August

3–6	GeoHunan: Challenges and Recent Advances in Pavement Technologies and Transportation Geotechnics*
17–18	5th New York City Bridge Conference*
24–27	Transportation Hazards and Security Summit 2009: Progress Through Partnership
29–Sept. 2	14th Conference on Cold Regions Engineering*

September

2	Symposium on Equity Issues in Financing Transportation
6–9	4th International Congress of Smart Rivers 21: The Future of Inland Navigation*
14–15	Integrated Corridor System Management Modeling Best Practices Workshop
16–17	North American Freight Flows Conference 2009
17–18	Research on the Transmission of Disease in Airports and on Aircraft: A Symposium
28	Long-Term Performance of Geotechnical Infrastructure

October

5–7	European Transport Conference*
13–14	Infrastructure and Security Workshop*
15–16	Value of Travel Time Reliability and Cost-Benefit Analysis
19–22	8th National Conference on Asset Management
27–30	4th International Conference on Women's Issues in Transportation
28–29	Workshop on Innovations in Traffic Congestion Monitoring*
29	Emergency Medical Services Summit and Midyear Meeting

November

12–13	Developing a Research Agenda for Transportation Infrastructure Preservation and Renewal Conference
16–18	5th National Transit GIS Conference*

December

13–18	12th International Conference on Travel Behavior Research*

*TRB is cosponsor of the meeting.

TRB WEBINAR SERIES 2009

March

26 Inspecting and Managing Highway Bridges

April

27 Performance-Based Hot-Mix Asphalt Construction Specification

May

7 Design and Production of High-Reclaimed Asphalt Pavement Mixes
12 Animal–Vehicle Collisions
19 Back to the Future: Do We Need Aviation Reregulation?

June

8 Risk Management in Public–Private Partnerships
18 Defining and Measuring Bridge Performance
30 Climate Change 101

July

9 Planning Guidelines and Best Management Practices for Aircraft and Airfield Deicing Stormwater Management System
13 How to Write an Effective Research Statement

August

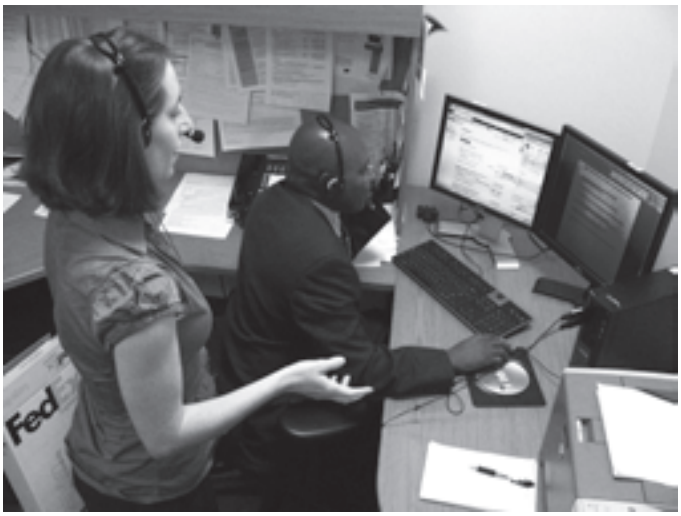
5 Introduction to the Capabilities of Culvert Analysis and Design
19 Energy Solutions
26 Funding Options for Freight Transportation Projects

September

10 U.S. Transportation System Scenarios to 2050 in a World Addressing Climate Change
17 Slope Maintenance and Slide Restoration

October

1 Creating an Innovative Workforce: Augmenting Words, Equations, and Data with Visualization
6 State and Local Government Responses to Climate Change
13 Asphalt Emulsions: Chemistry, Manufacturing, and Applications
21 Driving and the Built Environment: The Effects of Compact Development on Motorized Travel, Energy Use, and CO_2 Emissions
28 Estimating Stiffness of Subgrade and Unbound Materials for Pavement Design



Program Officer, Electronic Dissemination, Lisa Berardi Marflak (*left*) and Customer Service and Marketing Associate Reginald Gillum produce a webinar, or web-based seminar. TRB continued to expand its webinar program in 2009, with 27 sessions that averaged nearly 300 participants each.

November

4 Costing Asset Protection: An All-Hazards Guide for Transportation Agencies
10 Rheology of Asphalt Binders and Implications for Performance
17 Maintenance Practices for Traffic Sign Retroreflectivity
23 Using Pavement Management to Control Costs and Improve Services

December

2 A Transportation Research Program for Mitigating and Adapting to Climate Change and Conserving Energy
10 Encouraging Innovation in Locating and Characterizing Underground Utilities
16 Maintenance Practices for Pavement Marking Retroreflectivity

TRB PUBLICATIONS

Transportation Research Records

2090 Network Modeling 2009, Vol. 1
2091 Network Modeling 2009, Vol. 2
2092 Operational Effects of Geometrics and Access Management 2009
2093 Pavement Management 2009, Vol. 1
2094 Pavement Management 2009, Vol. 2
2095 Pavement Management 2009, Vol. 3
2096 Traffic Safety: Roundabouts, Trucks, Older Drivers, and Traffic Law Enforcement
2097 Freight Systems 2009
2098 Construction 2009
2099 Freeway Operations; Regional Systems Management and Operations; Managed Lanes 2009
2100 Marine Transportation and Port Operations 2009—Including 2009 Thomas B. Deen Distinguished Lecture
2101 Geology and Properties of Earth Materials 2009
2102 Safety Data, Analysis, and Evaluation 2009, Vol. 1
2103 Safety Data, Analysis, and Evaluation 2009, Vol. 2
2104 Geomaterials 2009
2105 Information Systems, Geographic Information Systems, and Advanced Computing 2009
2106 Aviation 2009
2107 Safety Maintenance and Surface Weather
2108 Maintenance and Management of the Infrastructure
2109 Research and Education 2009
2110 Transit 2009, Vol. 1
2111 Transit 2009, Vol. 2
2112 Transit 2009, Vol. 3
2113 Concrete Materials 2009
2114 Developing Countries 2009
2115 Finance, Pricing, Economics, and Economic Development
2116 Soil Mechanics 2009
2117 Railways 2009
2118 Behavioral and Social Factors
2119 Planning 2009
2120 Highway Design 2009
2121 Data Systems and Travel Survey Methods 2009
2122 Traffic Control Devices, Visibility, and Highway–Rail Grade Crossings 2009
2123 Environment 2009
2124 Traffic Flow Theory, Characteristics, and Simulation Models 2009
2125 Social Equity, Gender Issues, and Mobility
2126 Bituminous Materials and Mixtures 2009, Vol. 1
2127 Bituminous Materials and Mixtures 2009, Vol. 2
2128 Traffic Signal Systems 2009
2129 Intelligent Transportation Systems and Vehicle–Highway Automation 2009
2130 Highway Capacity and Quality of Service 2009
2131 Structures 2009
2132 Travel Demand Forecasting 2009, Vol. 1
2133 Travel Demand Forecasting 2009, Vol. 2
2134 Travel Behavior 2009, Vol. 1
2135 Travel Behavior 2009, Vol. 2
2136 Statistical Methods 2009
2137 Safety 2009: Security, Emergencies, Management, and School Transportation
2138 Human Performance, Information Systems, Simulation, and Visualization
2139 Energy and Global Climate Change 2009
2140 Pedestrians, Bicycles, and Motorcycles

Special Reports[1]

296 Implementing the Results of the Second Strategic Highway Research Program: Saving Lives, Reducing Congestion, Improving Quality of Life
297 Funding Options for Freight Transportation Projects
298 Driving and the Built Environment: Effects of Compact Development on Motorized Travel, Energy Use, and CO_2 Emissions
299 A Transportation Research Program for Mitigating and Adapting to Climate Change and Conserving Energy

Conference Proceedings[1]

45 U.S. Marine Salvage Assets and Capabilities in a Maritime Disaster: Summary of a Workshop

Letter Reports (online)

Committee for Pavement Technology Review and Evaluation, March 12, 2009
Committee for a Review of the U.S. Department of Transportation Study on Implementation of Changes to the Section 4(f) Process, April 7, 2009
Committee for Review of the Federal Railroad Administration Research and Development Program, April 22, 2009
Transit Research Analysis Committee, May 26, 2009
Long-Term Pavement Performance Committee, June 17, 2009
Committee on Alaska's Oil and Gas Infrastructure: Risk Assessment Peer Review, September 29, 2009

Long-Term Pavement Performance Committee Report

Preserving and Maximizing the Utility of the Pavement Performance Database

Transportation Research E-Circulars (online)

132 Young Impaired Drivers: The Nature of the Problem and Possible Solutions
133 Glossary of Regional Transportation Systems Management and Operations Terms
134 Influence of Roadway Surface Discontinuities on Safety: State of the Art Report
135 Maintenance Management 2009: Presentations from the 12th AASHTO–TRB Maintenance Management Conference
136 Implementation Status for Geotechnical Load and Resistance Factor Design in State Departments of Transportation
137 Glossary of Highway Quality Assurance Terms (Fourth Update)

138 Critical Issues in Aviation and the Environment 2009
139 Use of Accelerated Pavement Testing to Evaluate Maintenance and Pavement Preservation Treatments
140 A Review of the Fundamentals of Asphalt Oxidation: Chemical, Physicochemical, Physical Property, and Durability Relationships
141 Colorado's Full-Scale Field Testing of Rockfall Attenuator Systems

TR News

Nos. 260–265

Online Newsletters

Intercity Rail Passenger Systems Update, Nos. 14–15
LRT News, Vol. 21, No. 1
TRB Transportation Research Electronic Newsletter

ACRP Reports[2]

1 Safety Management Systems for Airports, Vol. 2: Guidebook
11 Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories
12 An Airport Guide for Regional Emergency Planning for CBRNE Events
13 Integrating Airport Information Systems
14 Deicing Planning Guidelines and Practices for Stormwater Management Systems
15 Aircraft Noise: A Toolkit for Managing Community Expectations
16 Guidebook for Managing Small Airports
17 Airports and the Newest Generation of General Aviation Aircraft
- Vol. 1: Forecast
- Vol. 2: Guidebook

18 Passenger Air Service Development Techniques
20 Strategic Planning in the Airport Industry
21 A Guidebook for Selecting Airport Capital Project Delivery Methods
22 Helping Airport and Air Carrier Employees Cope with Traumatic Events
23 Airport Passenger-Related Processing Rates Guidebook
24 Guidebook for Evaluating Airport Parking Strategies and Supporting Technologies
26 Guidebook for Conducting Airport Users Surveys
27 Enhancing Airport Land Use Compatibility

ACRP Syntheses of Airport Practice[2]

13 Effective Practices for Preparing Airport Improvement Program Benefit–Cost Analysis
14 Airport System Planning Practices
15 Identification of the Requirements and Training to Obtain Driving Privileges on Airfields
16 Compilation of Noise Programs in Areas Outside DNL 65
17 Approaches to Integrating Airport Development and Federal Environmental Review Processes

ACRP Research Results Digests[2]

4 Synthesis of Information Related to Airport Practices
5 Current and Emerging Issues Facing the Airport Industry
6 Guidance for Identifying and Mitigating Approach Lighting System Hazards
7 A Summary of How Proposed Firefighting Standards Would Impact Airports

ACRP Legal Research Digests[2]

5 Responsibility for Implementation and Enforcement of Airport Land Use Zoning Restrictions
6 The Impact of Airline Bankruptcies on Airports
7 Airport Governance and Ownership
8 The Right to Self-Fuel

ACRP Web-Only Documents (online)

1 Analysis and Recommendations for Developing Integrated Airport Information Systems
2 Appendices to ACRP Report 11: Guidebook on Preparing Airport GHG Emissions Inventories
3 Formulations for Aircraft and Airfield Deicing and Anti-Icing: Aquatic Toxicity and Biochemical Oxygen Demand
4 Guidance for Identifying and Mitigating Approach Lighting System Hazards
5 Development of a Guidebook for Managing Small Airports
6 Evaluation and Selection of Airport Capital Project Delivery Methods
7 How Proposed ARFF Standards Would Impact Airports
9 Enhanced Modeling of Aircraft Taxiway Noise-Scoping

National Cooperative Freight Research Program (NCFRP) Reports[2]

1 Public- and Private-Sector Interdependence in Freight Transportation Markets
2 Institutional Arrangements for Freight Transportation Systems

NCFRP Research Results Digests[2]

1 National Cooperative Freight Research Program: A Status Report

Hazardous Materials Cooperative Research Program (HMCRP) Reports[2]

1 Hazardous Materials Transportation Incident Data for Root Cause Analysis

National Cooperative Highway Research Program (NCHRP) Reports[3]

500 Guidance for Implementation of the AASHTO Strategic Highway Safety Plan, Vol. 23: A Guide for Reducing Speeding-Related Crashes
525 Surface Transportation Security
- Vol. 14: Security 101—A Physical Security Primer for Transportation Agencies
- Vol. 15: Costing Asset Protection—An All-Hazards Guide for Transportation Agencies

610 Communication Matters: Communicating the Value of Transportation Research—Guidebook
625 Procedures Guide for Right-of-Way Cost Estimation and Cost Management
626 NDT Technology for Quality Assurance of HMA Pavement Construction

628 Self-Consolidating Concrete for Precast, Prestressed Concrete Bridge Elements
630 Measuring Tire–Pavement Noise at the Source
631 Updated Test and Design Methods for Thermoplastic Drainage Pipe
632 An Asset-Management Framework for the Interstate Highway System
633 Impact of Shoulder Width and Median Width on Safety
634 Texturing of Concrete Pavements
635 Acoustic Beamforming: Mapping Sources of Truck Noise
636 Tools to Aid State DOTs in Responding to Workforce Challenges
637 Guidelines for Dowel Alignment in Concrete Pavements
638 Guidelines for Guardrail Implementation
639 Adhesive Anchors in Concrete Under Sustained Loading Conditions
640 Construction and Maintenance Practices for Permeable Friction Courses
641 Guidance for the Design and Application of Shoulder and Centerline Rumble Strips
642 Quantifying the Benefits of Context-Sensitive Solutions
643 Implementing Transportation Knowledge Networks

NCHRP Syntheses of Highway Practice[3]

388 Pre-Overlay Treatment of Existing Pavements
389 Performance-Based Contracting for Maintenance
390 Performance-Based Construction Contractor Prequalification
391 Public-Sector Decision Making for Public–Private Partnerships
392 Transportation's Role in Emergency Evacuation and Reentry
393 Adjacent Precast Concrete Box Beam Bridges: Connection Details
394 Reducing Litter on Roadsides
395 Debt Finance Practices for Surface Transportation
397 Bridge Management Systems for Transportation Agency Decision Making
398 Cathodic Protection for Life Extension of Existing Reinforced Concrete Bridge Elements
399 Real-Time Traveler Information Systems
400 Identifying Promising Technologies for Environmental Surveys
401 Quality Management of Pavement Condition Data Collection
402 Construction Manager-at-Risk Project Delivery for Highway Programs

NCHRP Research Results Digests[3]

321 Guide for Pavement Friction: Background and Research
331 Preparing Coordinated Transportation Plans: A Guidebook for State Departments of Transportation
332 Continuing Project to Synthesize Information on Highway Problems
333 A Guide to Planning Resources on Transportation and Hazards (joint with TCRP Research Results Digest 90)
334 Joint Workshop on Abutment Scour: Present Knowledge and Future Needs—June 2008
335 Performance Measures for Snow and Ice Control Operations
336 Benefit–Cost Analysis of Converting a Lane for Bus Rapid Transit
337 Design Flexibility Considerations for Built Urban Environments
338 Utilization by States of the Flexibility to Transfer Federal Funds Among Eligible Federal Programs
339 Improving the Safety of Mobile Lane Closures
340 State DOT Best Practices for Developing a Title VI Civil Rights Program Document

NCHRP Legal Research Digests[3]

51 Major Legal Issues for Highway Public–Private Partnerships
52 Record Keeping Requirements for State Departments of Transportation

NCHRP Web-Only Documents (online)

131 Communicating the Value of Transportation Research
132 Right-of-Way Methods and Tools to Control Project Cost Escalation
133 Supporting Materials for NCHRP Report 626
134 An Experimental Plan for Validation of an Endurance Limit for HMA Pavements
135 Protocols for Collecting and Using Traffic Data in Bridge Design
136 Performance Measures for Snow and Ice Control Operations
137 Guidance for Transportation Project Management
138 Annotated Literature Review for NCHRP Report 640
139 Precision Estimates for AASHTO Test Method T 105, Determined Using CCRL Proficiency Sample Data
140 Precision Estimates for AASHTO Test Methods T 186, T 154, and T 22, Determined Using CCRL Proficiency Sample Data
141 Precision Estimates for AASHTO Test Method T 104, Determined Using AMRL Proficiency Sample Data
142 Precision Estimates of AASHTO T 242
143 Implementable Strategies for Shifting to Direct Usage-Based Charges for Transportation Funding
144 Recommended Practice for Stabilization of Subgrade Soils and Base Materials
145 Recommended Practice for Stabilization of Sulfate-Rich Subgrade Soils
146 Replacement Processes for LED Traffic Signals

Transit Cooperative Research Program (TCRP) Reports[2]

129 Local and Regional Funding Mechanisms for Public Transportation
130 Shared Use of Railroad Infrastructure with Noncompliant Public Transit Rail Vehicles: A Practitioner's Guide
131 A Guidebook for the Evaluation of Project Delivery Methods
132 Assessment of Hybrid–Electric Transit Bus Technology
133 Practical Measures to Increase Transit Advertising Revenues
134 Transit, Call Centers, and 511: A Guide for Decision Makers
135 Controlling System Costs: Basic and Advanced Scheduling Manuals and Contemporary Issues in Transit Scheduling
136 Rural Demand-Responsive Transportation: Guidebook for Measuring, Assessing, and Improving Performance
137 Improving Pedestrian and Motorist Safety Along Light Rail Alignments

TCRP Syntheses of Transit Practice[2]

79 Light Rail Vehicle Collisions with Vehicles at Signalized Intersections
80 Transit Security Update

TCRP Research Results Digests[2]

89 Public Transportation's Role in Addressing Global Climate Change
90 A Guide to Planning Resources on Transportation and Hazards (joint with NCHRP Report 333)
91 Synthesis of Information Related to Transit Problems
92 Balancing Infrastructure Reinvestment with System Expansion
93 Rural Transit Achievements: Assessing the Outcomes of Increased Funding for Rural Passenger Services Under SAFETEA-LU

TCRP Legal Research Digests[2]

29 First Amendment Implications for Transit Facilities: Speech, Advertising, and Loitering

TCRP Web-Only Documents (online)

41 Evaluation of Project Delivery Methods
43 Track Maintenance Costs on Rail Transit Properties
44 Literature Review for Providing Access to Public Transportation Stations
45 Appendixes to TCRP Report 135: Controlling System Costs—Basic and Advanced Scheduling Manuals and Contemporary Issues in Transit Scheduling
46 Rural Transit Achievements: Assessing the Outcomes of Increased Funding for Rural Passenger Services Under SAFETEA-LU
47 Guidelines for Rail Base Inspection and Rail Condemnation Limits for Corrosion-Induced Material Loss

Cooperative Research Programs CD-ROMs

20 Selected Studies in Transportation Law: Vol. 2, Eminent Domain
70 Toolkit for ACRP Report 15
71 Appendixes to and Toolkit for TCRP Report 132: Assessment of Hybrid–Electric Transit Bus Technology
72 Appendixes to and Supporting Materials for NCFRP Report 2: Institutional Arrangements for Freight Transportation Systems
73 Workbook for ACRP Report 20: Strategic Planning in the Airport Industry

Commercial Truck and Bus Safety Synthesis Program (CTBSSP) Synthesis Reports[2]

17 Special Safety Concerns of School Bus Drivers

CTBSSP Research Results Digest[2]

7 Commercial Truck and Bus Safety Synthesis Program: A Status Report

Strategic Highway Research Program 2 (SHRP 2) Capacity Research Reports[2]

2 Performance Measurement Framework for Highway Capacity Decision Making

SHRP 2 Reliability Research Reports (online)

1 Encouraging Innovation in Locating and Characterizing Underground Utilities
6 A Plan for Developing High-Speed, Nondestructive Testing Procedures for Both Design Evaluation and Construction Inspection
15 Integrating the Priorities of Transportation Agencies and Utility Companies

Ignition[2]

No. 15

TRB PUBLICATIONS

January 1–December 31, 2009

51 *Transportation Research Record: Journal of the Transportation Research Board*
4 Special Reports
1 Conference Proceedings
6 Letter Reports (online)
1 LTPP Report
10 Transportation Research Circulars (online)
6 Issues of *TR News*
2 Issues of *Intercity Rail Passenger Systems Update* (online)
1 Issue of *LRT News* (online)
49 Issues of *TRB E-Newsletter* (online)
17 ACRP Reports
5 ACRP Syntheses
4 ACRP Research Results Digests
4 ACRP Legal Research Digests
9 ACRP Web Documents (online)
2 NCFRP Reports
1 NCFRP Research Results Digest
1 HMCRP Report
21 NCHRP Reports
14 NCHRP Syntheses
11 NCHRP Research Results Digests
2 NCHRP Legal Research Digests
16 NCHRP Web Documents (online)
9 TCRP Reports
2 TCRP Syntheses
5 TCRP Research Results Digests
1 TCRP Legal Research Digest
6 TCRP Web Documents (online)
5 CRP CD-ROMs
1 CTBSSP Synthesis
1 CTBSSP Research Results Digest
1 SHRP 2 Capacity Research Report
3 SHRP 2 Reliability Research Reports
1 Issue of *Ignition*

[1] Available in print and online.
[2] Entire series available in print and online.
[3] Publications released since 2001 are available in print and online.

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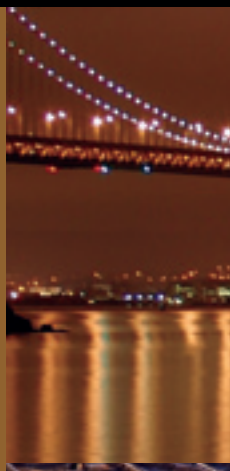

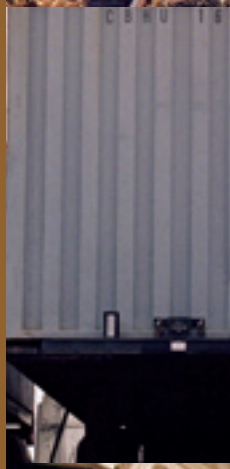

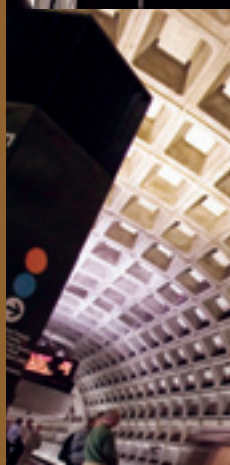

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