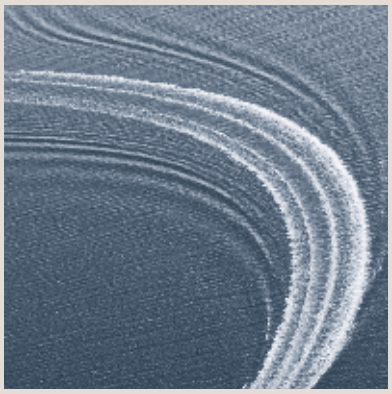
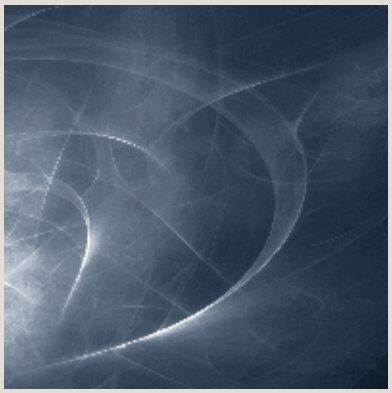


Transportation Research Board

2012 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

With few exceptions—most notably, railroads and pipelines—transportation infrastructure in the United States is publicly owned and maintained. As a result, marketplace forces are not steadily encouraging innovation. The public sector must *choose* to innovate to deliver better, more cost-effective services to users and other constituents. The public sector must *choose* to invest in research, development, and other steps in the innovation process.

Better service means faster, more reliable transportation; facilities and services with more positive community and environmental impacts and fewer negative impacts; and services that more effectively promote economic growth. The list of what is needed to make the U.S. transportation system better suited to the needs of the 21st century never seems to get shorter. The pressure to be more cost-effective and to lower life-cycle costs is relentless, and needs change as emphasis shifts from construction to operations and reconstruction, as population demographics change, and as societal values shift.

Deborah H. Butler, Executive Committee Vice Chair (*left*); Sandra Rosenbloom, Executive Committee Chair; and Robert E. Skinner, Jr., TRB Executive Director. (Photo: Risdon Photography)

At the 2012 TRB Annual Meeting, a panel of current and former U.S. Transportation Secretaries outlined the achievements and challenges in American transportation over the past 45 years. (*Left to right*:) 1967–1969 Secretary Alan Boyd, current Secretary Ray LaHood, 1992–1993 Secretary Andrew Card, and TRB Executive Director Robert E. Skinner, Jr. (Photo: Risdon Photography)

Like most of the world, the United States has relied on its national government to take a long-term view and choose to invest in transportation research and development (R&D), including the pilot tests and technology transfer activities that are necessary components of the innovation process. Directly or indirectly, our federal government is the dominant funder of R&D for highways, airports and air traffic control, public transportation, inland waterways, and multimodal policy, planning, and environmental needs.

Because of this dominant federal role, all us of involved with transportation R&D—including

Control tower at Sea-Tac Airport in Washington State. Funding for air traffic control, airport infrastructure, and other aviation needs was reauthorized in the Federal Aviation Administration Modernization and Reform Act of 2012. (Photo: Don Wilson, Port of Seattle)

those of us connected to TRB—are especially attentive when changes to federal transportation programs are under consideration and when programs are reauthorized. This year, federal funding for aviation was reauthorized by the Federal Aviation Administration (FAA) Modernization and Reform Act of 2012, and funding for surface transportation—highways and public transportation—by the Moving Ahead for Progress in the 21st Century Act (MAP-21). A variety of forums have summarized the changes to these programs and their R&D components, but the effects and potential effects that the changes will have specifically on TRB activities are worth highlighting.

EFFECTS OF REAUTHORIZATION

- **State Planning and Research (SP&R) funds and implementation of the second Strategic Highway Research Program (SHRP 2) products:** Under the SP&R provision of the federal highway program, a portion of federal aid must be devoted to planning and research; state departments of transportation (DOTs) use this funding to support TRB's core program—the work of standing committees, the Annual Meeting, many publications, and the TRID database—and the National Cooperative Highway Research Program (NCHRP).

  MAP-21 reauthorized the SP&R program, as well as federal spending to implement SHRP 2 products. The legislation, however, did not provide specific funding for SHRP 2 implementation but allowed state DOTs to spend SP&R funds for this purpose, as long as at least 75 percent of state DOTs consented. By a vote of 45 to 3, state DOTs decided in September to devote 4 percent of SP&R funding for fiscal year (FY) 2013 and FY 2014—approximately $60 million annually—to SHRP 2 implementation. The Federal Highway Administration (FHWA) will administer the SHRP 2 implementation funds.
- **Cooperative research programs:** The FAA Modernization and Reform Act of 2012 reauthorized the Airport Cooperative Research Program (ACRP), which TRB administers for FAA, but did not authorize a specific funding level, which had been $15 million annually. The impact on future funding remains to be seen; as in the past, the congressional appropriation process will determine actual funding.

  MAP-21 reauthorized the Transit Cooperative Research Program (TCRP) at a reduced level, from the previous $10 million to $7 million annually. This will be the maximum level of annual funding; congressional appropriations will determine the actual amount.

  MAP-21 failed to reauthorize the National Cooperative Freight Research Program (NCFRP) and the Hazardous Materials Cooperative Research Program (HMCRP), which TRB has managed on behalf of the Research

At a meeting with TRB state representatives, Gregory Winfree, Acting Administrator, Research and Innovative Technology Administration, discussed funding for research. (Photo: Risdon Photography)

and Innovative Technology Administration (RITA) and the Pipeline and Hazardous Materials Safety Administration, respectively. Accordingly, TRB has begun the process of shutting down these programs.

- **Special studies:** Reauthorization of federal transportation programs often has served as the mechanism by which Congress has requested special studies to be performed by TRB and other parts of the National Academies. The FAA Modernization and Reform Act of 2012 authorized three National Academies studies related to air traffic control; TRB will take the lead on one dealing with staffing levels for air traffic controllers. MAP-21 requested only one transportation-related National Academies project—a review of a planned report by the U.S. Department of Transportation on the deployment of vehicle-to-vehicle and vehicle-to-infrastructure communications systems. An earlier congressional request for a TRB review of U.S. DOT's strategic plan for R&D remains in place.

Reauthorization activities and reauthorization bills, although affecting TRB in the future, had minimal effects on the Board's 2012 programs, which were as vibrant and productive as ever, as highlighted below.

ANNUAL MEETING AND CONFERENCES

Participation in the 2012 Annual Meeting continued recent trends with a record number of paper submissions—more than 4,200—and with another attendance record of more than 11,000. Program highlights included the Chairman's Luncheon address by Virginia-based journalist and author Earl Swift, who shared his perspective on the history of the Interstate Highway System, the subject of his 2011 book, *The Big Roads: The Untold Story of the Engineers, Visionaries, and Trailblazers Who Created The American Superhighways*; the Thomas B. Deen Distinguished lecture by William W. Millar, recently retired as president of the American Public Transportation Association (APTA); and a remarkable session at which five former secretaries of the U.S. DOT, including the first Secretary Alan Boyd, joined current Secretary Ray LaHood in a spirited discussion about the future of transportation.

With more than 11,000 attendees, the 2012 Annual Meeting continued a trend of record-setting attendance. (Photo: Risdon Photography)

In addition to the Annual Meeting, TRB sponsored 25 national and international conferences in 2012 and cosponsored 25 others. These included the biennial Transportation Asset Management Conference; the biennial North American Travel Monitoring Exposition and Conference; the 14th International Managed Lanes Conference; and in conjunction with the Waterways Association of Pittsburgh, Pennsylvania, a conference on America's Maritime Infrastructure: Investing for Safety, Security, and Prosperity. TRB also produced two important public transportation conferences, sponsoring the Fifth National Bus Rapid Transit Conference and cosponsoring the 12th National Light Rail Conference with APTA.

TECHNICAL ACTIVITIES

Under the guidance and oversight of the Technical Activities Council, several initiatives aimed at improving the Annual Meeting and other core program activities. Three deserve special mention:

- To increase the input from young professionals, TRB established a Young Members Council. The group's chair serves on the Technical Activities Council and participates at Executive Committee meetings as an ex officio member.
- To increase recognition for special accomplishments, TRB established the William W. Millar Award for best paper in public trans-

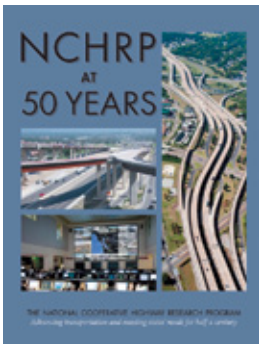
Earl Swift, author of *The Big Roads*, spoke on highway history—with insights on TRB's role and connections—in his Chairman's Luncheon address. (Photo: Risdon Photography)

The Young Members Council provides input to the Technical Activities Council and TRB leadership on programs and activities important to members age 35 and under. (Photo: Risdon Photography)

portation and is introducing blue ribbon awards for outstanding accomplishments by TRB standing committees.

- To advance its strategic review of the structure, content, and business practices of the *Transportation Research Record* (TRR), TRB's peer-reviewed journal, the TRR Publication Board conducted a survey of TRR stakeholders, which found that most respondents believed that the stature and quality of the TRR had increased in the past decade. Stakeholders generated many suggestions for further improvements, which the Publication Board and staff are now considering.

RESEARCH MANAGEMENT



NCHRP's 50-year anniversary was recognized with a special brochure and video.

Cooperative Research Programs

TRB's cooperative research programs celebrated two significant anniversaries this year: NCHRP's 50th and TCRP's 20th.

Because each state and the District of Columbia voluntarily provide financial support for NCHRP, this 50-year milestone is especially significant—a testament to the efforts of state DOTs working through the American Association of State Highway and Transportation Officials (AASHTO), to TRB volunteers and staff, to our FHWA partners, and to the research community. These coordinated efforts make the program effective and continuously relevant to the needs of agencies and practicing professionals in the highway field.

A special brochure and video highlighting NCHRP accomplishments and impacts on highway transportation in the past 50 years were developed and presented at various AASHTO and TRB venues during the year and will be available at our 2013 Annual Meeting. More importantly, NCHRP published approximately 70 research reports this year addressing a diverse set of topics related to highway planning, design, construction, maintenance, management, and operations.

TCRP is a partnership between the Federal Transit Administration (FTA), APTA, and TRB. In its 20-year history, TCRP repeatedly has demonstrated how an applied, problem-solving research program directed by stakeholders can benefit individual transit operators and the industry as a whole. This year, TCRP published approximately 30 research reports addressing a broad agenda of timely topics including escalator and elevator maintenance and safety practices, fuel purchasing strategies, techniques and tools for protecting wayside rail transit workers, access to public transportation stations, ferry transportation, asset management, appropriate uses of social media, and light rail transit track design.

After the appointment of an oversight committee by Secretary LaHood, the new National Cooperative Rail Research Program has started up. With funding from FY 2010 only and uncertainty about the future, the committee chose research projects with special care. Topics include tools and procedures for planning intercity rail passenger services, the potential for passenger rail in competitive intercity travel markets, rail industry workforce capacity, financing approaches for freight and passenger rail services, multistate passenger rail organizations, and legal issues associated with passenger rail.

This year, ACRP published 40 research reports, including a practical guidebook for commercial airports on how to prepare for and handle irregular operations such as unscheduled emergency arrivals. The timely guidebook went into immediate use in seven specially organized regional training sessions for airports and their governmental and private-sector partners. Other report topics included airport privatiza-

Members of a National Cooperative Rail Research Program panel gathered in Washington, D.C., in October to discuss a project on rail financing approaches.

tion, in-airport passenger conveyance systems, terminal rehabilitation versus replacement, asset management, and risk management.

NCFRP published 12 reports in 2012 on topics that included understanding urban goods movements and multimodal freight transportation within the Great Lakes–Saint Lawrence Basin. HMCRP, the smallest of the programs, published four reports, including one that addresses the role of human factors in preventing cargo tank truck rollovers.

SHRP 2

SHRP 2 operated at peak capacity in 2012, the seventh year of the nine-year program, with 70 active contracts out of a total of 116 awarded to date. At the same time, TRB is working closely with FHWA, AASHTO, and other potential users of SHRP 2 products to move the research results into routine use.

Many SHRP 2 products are undergoing field tests. Two SHRP 2 prototype technologies for locating underground utilities were successfully tested in 2012—when fully developed, these technologies will significantly reduce delays and costs in highway renewal projects. After a pilot test of SHRP 2 guidelines for use of precast concrete panels, the Illinois Tollway Authority has initiated a project using 700 panels for pavement repair at an expected savings of $350,000 from the cost of standard repair procedures.

Other users already have adopted and incorporated emerging products into their operations. For example, AASHTO's Systems Operations and Maintenance Guidance has incorporated SHRP 2–developed guidelines for transportation agencies to become more operations-oriented. FHWA has initiated a nationwide offering of multiagency incident response training developed under SHRP 2.

Even as completed products are making their way into the hands of users, some SHRP 2 work is laying the foundation for further R&D activities. One example is a long-term plan for dramatically improving freight demand forecasting and collecting the data required to build demand models. Most significant is the SHRP 2 naturalistic driving study (NDS), which uses instrumented vehicles to collect continuous information about driver behavior. Nearly 2,500 drivers have participated in the study to date, generating 4 million miles of driving data. The data—which include more than 100 crashes, thousands of safety-related events, and thousands of miles of uneventful driving—are already under study for important safety issues, such as driver distraction and the effect of intersection design on crash risk. We expect that researchers will use these data for years, probably decades, to gain insights into driver behavior for improved vehicle designs, roadway designs, and regulatory approaches promoting highway safety.

The SHRP 2–developed Selection Assistant for Utility Locating Technologies tool provided a cost-saving preliminary estimate and comparison of alternatives for a proposed alignment of Route 620 in Fairfax County, Virginia. (Photo: Trevor Wrayton, Virginia DOT)

Riaz Ahmad, iEngineering, discussed data priorities at an October meeting of the Expert Task Group on Long-Term Pavement Performance Special Activities.

TRB has played an important role supporting FHWA and AASHTO in the development of a three-year plan for implementing SHRP 2 products. SHRP 2 contractors and staff will continue to provide support as the products of the research are transferred to implementing agencies in the next two years. Some of this support will include additional product development to ensure that the results of the research serve user needs as fully as possible.

POLICY STUDIES

This year has been a quiet one with respect to the releases of completed policy study reports. One report was released, conducted under the auspices of the Marine Board, addressing the federal government's approach to evaluating the effectiveness of safety and environmental management systems for offshore oil and gas operations. Several letter reports were issued by special TRB committees that conduct continuing reviews of the R&D programs of FHWA, FTA, and FRA, as well as reviews of major research projects such as the Long-Term Bridge Performance and the Long-Term Pavement Performance programs.

Several policy studies are under way and are slated for release in 2013 or 2014. Of particular interest are two studies initiated by the TRB Executive Committee and funded wholly or in part by TRB. The first is a scoping study assessing what is known or could be known about the economic and employment benefits of public investments in transportation infrastructure in response to economic downturns. The second is examining intercity passenger traffic in short-haul markets of 100 to 500 miles; the study will synthesize and interpret information about the characteristics, the economics, and other associated issues for travel by air, intercity or high-speed rail, bus, and private motor vehicles.

INTERNATIONAL ACTIVITIES

Last year's letter to TRB supporters listed several examples of the growing international presence at TRB. One new example is a joint project sponsored by RITA, the European Commission, and TRB. Through a series of four invitation-only symposia, to be held annually beginning in 2013, this project will convene U.S. and European researchers in four theme areas for two days of intensive discussion about ongoing research on both sides of the Atlantic and about opportunities for closer research collaboration between the United States and Europe. The first symposium will be held in the late spring or early summer of 2013.

Also noteworthy has been the response to the new TRID bibliographic database, which combined TRB's Transportation Research Information Services database with the International Transport Research Documentation database produced through the Organisation for Economic Co-operation and Development and the International Transport Forum. In its first full year of operation, this multilingual database served 1 million visitors from nearly every country in the world.

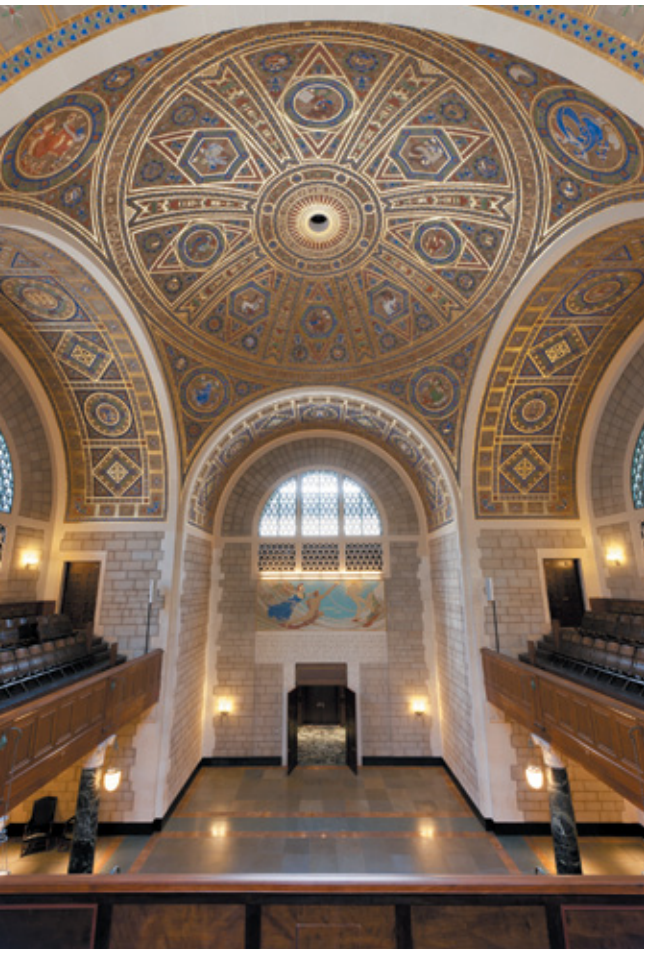
AWARD-WINNING IDEA PROJECT

For 20 years, TRB's Innovations Deserving Exploratory Analysis (IDEA) programs have provided seed funding on a cost-sharing basis that has supported proof-of-concept and developmental research for promising ideas. This support of a high-risk endeavor is often necessary to help turn a good idea into a marketable product, and the IDEA program has a solid track record of success. One example is the hybrid composite beam developed by John Hillman; the American Society of Civil Engineers recently selected Hillman to receive the prestigious Charles Pankow Award for Innovation in 2013.

NEWS FROM THE NATIONAL ACADEMIES

In February, Bruce B. Darling was named Executive Officer of the National Academy of Sciences and the National Research Council. Darling assumed the post full-time in July 2012. As the most senior nonelected official of the National Academies, he is responsible for day-to-day management of the institution. Previously he held positions in the University of California System, most recently as Vice President for Laboratory Management. He succeeds E. William Colglazier, who retired from the National Academies in 2011 and currently serves as the science and technology adviser at the U.S. Department of State.

The restoration and rehabilitation of the historic National Academy of Sciences building was completed this year, and staff members returned to the building in June. The moves enabled TRB's SHRP 2, IDEA program, and Cooperative Research Program Synthesis units to return to the Keck Center from temporary quarters elsewhere. After a two-year break with tradition, TRB staff members are now once again under one roof.



Renovation of the historic National Academy of Sciences building on Constitution Avenue was completed this year. (Photo copyright Maxwell Mackenzie, 2012)

In July, Bruce B. Darling was named Executive Officer of the National Academy of Sciences and the National Research Council. (Photo: The National Academies Office of News and Public Information)

Sandra Rosenbloom
Chair, Executive Committee

Robert E. Skinner, Jr.
Executive Director

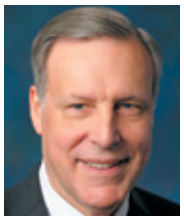
Transportation Research Board 2012 Executive Committee*

Chair: Sandra Rosenbloom, Director, Innovation in Infrastructure, The Urban Institute, Washington, D.C.
Vice Chair: Deborah H. Butler, Executive Vice President, Planning, and CIO, Norfolk Southern Corporation, Norfolk, Virginia
Executive Director: **Robert E. Skinner, Jr.,** Transportation Research Board

Victoria A. Arroyo, Executive Director, Georgetown Climate Center, and Visiting Professor, Georgetown University Law Center, Washington, D.C.
J. Barry Barker, Executive Director, Transit Authority of River City, Louisville, Kentucky
William A. V. Clark, Professor of Geography (emeritus) and Professor of Statistics (emeritus), Department of Geography, University of California, Los Angeles
Eugene A. Conti, Jr., Secretary of Transportation, North Carolina Department of Transportation, Raleigh
James M. Crites, Executive Vice President of Operations, Dallas–Fort Worth International Airport, Texas
Paula J. C. Hammond, Secretary, Washington State Department of Transportation, Olympia
Michael W. Hancock, Secretary, Kentucky Transportation Cabinet, Frankfort
Chris T. Hendrickson, Duquesne Light Professor of Engineering, Carnegie Mellon University, Pittsburgh, Pennsylvania
Adib K. Kanafani, Professor of the Graduate School, University of California, Berkeley (Past Chair, 2009)
Gary P. LaGrange, President and CEO, Port of New Orleans, Louisiana
Michael P. Lewis, Director, Rhode Island Department of Transportation, Providence
Susan Martinovich, Director, Nevada Department of Transportation, Carson City
Joan McDonald, Commissioner, New York State Department of Transportation, Albany
Michael R. Morris, Director of Transportation, North Central Texas Council of Governments, Arlington (Past Chair, 2010)
Tracy L. Rosser, Vice President, Regional General Manager, Wal-Mart Stores, Inc., Mandeville, Louisiana
Henry G. (Gerry) Schwartz, Jr., Chairman (retired), Jacobs/Sverdrup Civil, Inc., St. Louis, Missouri
Beverly A. Scott, General Manager and CEO, Rail and Transit Division, Massachusetts Department of Transportation, and Massachusetts Bay Transportation Authority, Boston
David Seltzer, Principal, Mercator Advisors LLC, Philadelphia, Pennsylvania
Kumares C. Sinha, Olson Distinguished Professor of Civil Engineering, Purdue University, West Lafayette, Indiana
Thomas K. Sorel, Commissioner, Minnesota Department of Transportation, St. Paul

Rosenbloom

Butler


Skinner

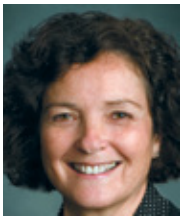
Arroyo

Barker

Clark

Conti

Crites


Hammond

Hancock

Hendrickson

Kanafani

LaGrange

Lewis

Martinovich

McDonald

Morris

Rosser

Schwartz

Scott

Seltzer

Sinha

Sorel

* Membership as of December 2012.

Sperling

Steudle

Stotlar

Walton

Brewster

Ferro

Gishi

Gray

Horsley

Huerta

Matsuda

Melaniphy

Mendez

O'Toole

Papp

Quarterman

Rogoff

Strickland

Szabo

Trottenberg

Van Antwerp

Wallerstein

Winfree

Daniel Sperling, Professor of Civil Engineering and Environmental Science and Policy; Director, Institute of Transportation Studies; and Acting Director, Energy Efficiency Center, University of California, Davis

Kirk T. Steudle, Director, Michigan Department of Transportation, Lansing

Douglas W. Stotlar, President and Chief Executive Officer, Con-Way, Inc., Ann Arbor, Michigan

C. Michael Walton, Ernest H. Cockrell Centennial Chair in Engineering, University of Texas, Austin (Past Chair, 1991)

Rebecca M. Brewster, President and COO, American Transportation Research Institute, Smyrna, Georgia (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)

John T. Gray II, Senior Vice President, Policy and Economics, 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)

Michael P. Huerta, Acting Administrator, Federal Aviation Administration, U.S. Department of Transportation (ex officio)

David T. Matsuda, Administrator, Maritime Administration, U.S. Department of Transportation (ex officio)

Michael P. Melaniphy, President and CEO, American Public Transportation Association, Washington, D.C. (ex officio)

Victor M. Mendez, Administrator, Federal Highway Administration, U.S. Department of Transportation (ex officio)

Tara O'Toole, Under Secretary for Science and Technology, U.S. Department of Homeland Security (ex officio)

Robert J. Papp (Adm., U.S. Coast Guard), Commandant, U.S. Coast Guard, U.S. Department of Homeland Security (ex officio)

Cynthia L. Quarterman, Administrator, Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation (ex officio)

Peter M. Rogoff, Administrator, Federal Transit Administration, U.S. Department of Transportation (ex officio)

David L. Strickland, Administrator, National Highway Traffic Safety 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)

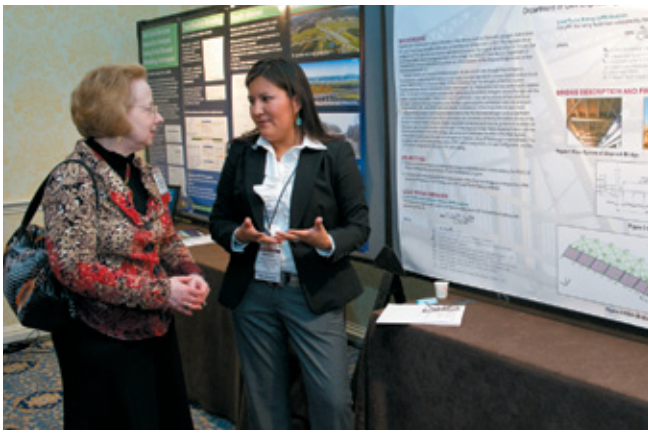
Barry R. Wallerstein, Executive Officer, South Coast Air Quality Management District, Diamond Bar, California (ex officio)

Gregory D. Winfree, Acting Administrator, Research and Innovative Technology Administration, U.S. Department of Transportation (ex officio)

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, staffing needs, and information technology services; 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.

Subcommittee for NRC Oversight (SNO) members for 2012 (*left to right:*) Neil J. Pedersen, past Executive Committee chair; Susan Martinovich; Deborah H. Butler, Executive Committee Vice Chair; Sandra Rosenbloom, Executive Committee Chair; Suzanne B. Schneider, TRB Associate Executive Director; and C. Michael Walton, SNO Chair. (Photo: Risdon Photography)



Monica Redhouse, New Mexico State University (*right*), discussed her research on three-dimensional analysis and load rating of a riveted steel, through-truss bridge with Suzanne B. Schneider at a Meet-the-Author poster session in January. Redhouse was one of nine students participating in the 2012 TRB Minority Student Fellows Program. (Photo: Risdon Photography)

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).

The Executive Office processes the Board's large volume of committee and panel appointments and maintains committee membership records. It also manages the institutional review process—a hallmark of the National Academies—designed 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 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 2012, the Board published 59 volumes of the journal, containing 940 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 the release of each printed volume. TRR Online includes all journal papers published since 1996, providing access to more than 12,000 papers in the TRR series.[1] The service allows all visitors to identify papers of interest and to 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 summaries, meeting announcements, and highlights of TRB activities also are included. The May–June 2012 theme issue, "Active Transportation: Implementing the Benefits," focused on bicycling and walking; the July–August issue highlighted transportation adaptations to climate change; and the September–October issue presented "Blueprints for Improving Highway Safety." Special features this year included articles on the 50th anniversary of the National Cooperative Highway Research Program and the 20th anniversaries of the Transit Cooperative Research Program and of

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

In 2012, the bimonthly magazine *TR News* began printing in full color; the web edition had been full color since 2011.

the Innovations Deserving Exploratory Analysis Program. Selected features 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 2012 included *The Safety Promise and Challenge of Automotive Electronics: Insights from Unintended Acceleration* and *Evaluating the Effectiveness of Offshore Safety and Environmental Management Systems*. 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. *Financing Surface Transportation in the United States: Forging a Sustainable Future—Now!* was printed and posted on the web.[4] Several titles were released in the Conference Proceedings on the Web series: *Transportation Systems for Livable Communities; Research on the Health and Wellness of Commercial Truck and Bus Drivers: Summary of an International Conference;* and *Improving Roadway Safety Programs Through University–Agency Partnerships*.[5]
- *Transportation Research E-Circulars* collect research problem statements, reports, and technical information from the work of TRB technical standing committees. Titles this year covered such topics as *Winter Maintenance and Surface Transportation Weather, Climate Change and Transportation: Summary of Key Information, Alternative Binders for Asphalt Pavement,* and *The Promise of Rural Roads*. Circulars are available exclusively in electronic format on the TRB website.[6]

[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/PubsConferencesandWorkshopsWeb.aspx.

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

Michael W. Hancock, Kentucky Transportation Cabinet, summarized the Executive Committee policy session, which examined current challenges in the inland ports and waterways system. (Photo: Risdon Photography)

- *Miscellaneous Reports* include special publications like the *Highway Capacity Manual 2010.* This year saw the release of a comprehensive, 650-page resource, *Rockfall: Characterization and Control*, including a DVD with video clips of rockfalls and pilot tests.[7]

In addition, the Cooperative Research Programs and SHRP 2 produce an array of titles in several publications series. For a list of all TRB publications, see pages 53–56.

COMMUNICATIONS

TRB has undertaken a variety of initiatives to improve the communication and public awareness of transportation issues and to enhance the dissemination of research findings worldwide.

One of the Board's most successful communications initiatives is the weekly *Transportation Research E-Newsletter*,[8] which reports on transportation research and research-related events within TRB and beyond. Circulation of the free newsletter is currently more than 30,000 and growing. Approximately one-fifth of the readership is from countries outside the United States. In 2012 TRB celebrated the 10th anniversary of the e-newsletter and began work on deliverabil-

[7] www.trb.org/Rockfall.

[8] 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.

ity and design upgrades for implementation in 2013.

TRB's website is designed to help users find research 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. Website functions—such as RSS (really simple syndication), Google-based search, Facebook, e-mail to a friend, and Twitter—allow users to keep up with and to share the latest developments in transportation research.

Through TRB's popular web briefing or "webinar" series, transportation professionals share and receive information online in a conference-like atmosphere while in their own offices. The webinars disseminate information on new TRB reports, TRB Annual Meeting sessions, and topics requested by TRB committees.[9] Three to four webinars are conducted each month, averaging more than 370 participants per session—a 34 percent increase over 2011 attendance.

In 2012 the American Institute of Certified Planners authorized TRB to provide Certification Maintenance Credits for attendance at select webinars; professional engineers became eligible to receive Professional Development Hour certificates for TRB webinars the year before. In addition, TRB program divisions increasingly rely on web briefings to train volunteers and to provide updates on research projects in progress.

Program Officer Lisa Berardi Marflak coordinates a webinar on asset management. The popular web seminars average more than 370 participants per session.

In the social networking arena, TRB's Twitter messages, or tweets, and Facebook posts highlight TRB and National Academies products and meetings, as well as other transportation-related news.[10] Since their launches, TRB's social media sites have attracted more than 5,000 Twitter followers and 1,700 Facebook fans.

[9] www.trb.org/ElectronicSessions/ConferenceRecordings.aspx.

[10] www.trb.org/ElectronicSessions/Twitter.aspx.

TRB's Twitter account (@TRBofNA) disseminates research news and information about TRB activities and the Annual Meeting to more than 5,000 followers.

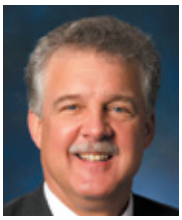
Staff News

KAREN S. FEBEY joined the staff of the TRB Executive Office as Report Review Officer in September.

Technical Activities

Katherine F. Turnbull
Council Chair
Technical Activities

Johanna P. Zmud
Chair
Policy and Organization Group



Mark S. Kross
Chair
Planning and Environment Group

Thomas J. Kazmierowski
Chair
Design and Construction Group

Paul J. Carlson
Chair
Operations and Preservation Group

James S. Thiel
Chair
Legal Resources Group

Ronald R. Knipling
Chair
System Users Group

Steven Silkunas
Chair
Public Transportation Group

Anthony D. Perl
Chair
Rail Group

Peter F. Swan
Chair
Freight Systems Group

Peter B. Mandle
Chair
Aviation Group

Thomas H.Wakeman, III
Chair
Marine Group

Harold R. (Skip) Paul
State DOT Representative

Joung H. Lee
Young Members Council Representative

Mark R. Norman
Director
TRB Technical Activities Division

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 works with thousands of volunteers on more than 200 standing committees to carry out activities on behalf of TRB sponsors and the transportation community.

The TRB Technical Activities Council oversees the organization and activities of the standing committees. Katherine F. Turnbull, Executive Associate Director of the Texas Transportation Institute at Texas A&M University, chairs the Technical Activities Council. TRB representatives in each state DOT, in each TRB sponsoring organization, in more than 150 universities, and in 25 transit agencies serve as liaisons to the transportation community.

By almost any measure, the TRB Technical Activities Division delivered more services and products to its stakeholders in 2012 than ever before. New highs were set with an Annual Meeting attendance of 11,000 and with more than 4,200 papers received and peer reviewed, more than 2,500 presented at the Annual Meeting, and 940 published in TRB's journal. The citation impact factor of .471 for the *Transportation Research Record* was just shy of the all-time high of .482, set the previous year.

TRB Executive Director Robert E. Skinner, Jr., briefed a meeting of the Technical Activities Council at the Annual Meeting. (Photo: Risdon Photography)

Other highlights included the following:

- A panel at the 2012 TRB Annual Meeting engaged five former Secretaries of the U.S. Department of Transportation (DOT), including Alan Boyd, the first to hold the position, and current Secretary Ray LaHood, in a spirited discussion on the future of transportation.
- Committees sponsored 25 national and international conferences and cosponsored 25 more. Many of these are noted in the following sections.
- A community of Communications Coordinators and Research Coordinators has launched guidance and training initiatives to foster and expand the communications and research portfolios of standing committees.
- Young transportation professionals gained a voice through the establishment of a Young Members Council (YMC); the YMC Chair serves as a member of the Technical Activities Council and a representative to the TRB Executive Committee.
- Formal recognitions of the achievements of TRB volunteers, authors, and committees have expanded with the establishment of the William W. Millar Award for best paper in public transportation and of Technical Activities Council blue ribbon awards for extraordinary accomplishments by standing committees.
- The Transportation Research Record (TRR) Publication Board initiated a strategic review of the journal's structure, content, and business plan. A survey of TRR stakeholders revealed a consensus that the stature and quality of TRB's journal have increased in the past decade. The survey also yielded many suggestions for further improvements, under consideration by the TRR Publication Board.

Young members of TRB standing committees participated in a roundtable discussion at the Annual Meeting. (Photo: Risdon Photography)

As chair of the Technical Activities Council, Katherine F. Turnbull, Texas A&M Transportation Institute, leads oversight of TRB's more than 200 standing committees. (Photo: Risdon Photography)

Additional highlights for 2012 from the Technical Activities Division's portfolio span the range of transportation disciplines and modes and are detailed in the following sections.

Johanna Zmud, RAND Corporation (*left*), led a meeting of the Special Task Force on Data for Decisions and Performance Measures. Experts from a range of transportation disciplines serve on TRB standing committees and task groups. (Photo: Risdon Photography)

POLICY AND ORGANIZATION

Policy and Administration

A joint meeting of the 10 standing committees in the Policy Section with counterparts in the American Association of State Highway and Transportation Officials (AASHTO) discussed infrastructure finance, road pricing, transportation demand management, and the nexus with economic development. Panelists included California DOT Director Malcolm Dougherty; Steve Heminger, Executive Director of the San Francisco Bay Area's Metropolitan Planning Commission; and California Secretary of Business, Transportation, and Housing Brian Kelly. A special session at the 2012 TRB Annual Meeting explored the topic, "What to Do When the TEA Runs Out: Challenges and Opportunities for Restructuring the Federal Surface Transportation Program."

Addressing the reductions in workforce and the economic constraints faced by many organizations in the transportation industry, the four standing committees of the Management and Leadership Section focused on tools and techniques to do more with less:

- The Performance Measurement Committee offered case studies at a 2012 Annual Meeting workshop on transportation agencies' use of metrics to increase public accountability, cost effectiveness, and program efficiency.
- The Strategic Management, Management and Productivity, and Performance Measures Committees conducted summer meetings in conjunction with the Asset Management Conference in San Diego, California. The three committees organized a workshop, "Increasing Innovation to Increase Results," which explored creative approaches to help organizations continue to thrive despite economic constraints.
- The biennial Transportation Asset Management Conference served as a venue for 35 states and nearly 300 participants to address approaches to implementing asset management. Strong participation from the transit community added a focus on the state of good repair.

Security

TRB's security activities continued to expand in 2012, with the establishment of two new task forces: the Task Force on Disaster Response and Business Continuity and the Task Force on Emergency Evacuation. Two new subcommittees also were formed to address cybersecurity and supply chain security under the Critical Transportation Infrastructure Protection Committee.

In August, TRB sponsored the Transportation Hazards and Security Summit and Peer Exchange in Irvine, California. The program focused on bridging the gaps in understanding the dynamics of multiagency response and recovery missions. The summit included a peer exchange and workshops to demonstrate the cooperative efforts of agencies in developing emergency response plans and activities.

Data and Information Systems

The 11 standing committees in the Data Section led initiatives to advance the use of data and information resources to improve transportation.

- The biennial North American Travel Monitoring Exposition and Conference offered a venue for states and metropolitan planning organizations to examine approaches to improving the collection and use of traffic

At the 26th North American Transportation Statistics Interchange in June, representatives from U.S. DOT and its Canadian and Mexican counterparts, along with other federal agencies, signed a memorandum of cooperation to develop and maintain a comprehensive set of comparative transportation statistics for all modes of North American transportation.

monitoring; 35 states participated. By adding the International Conference on Weigh-in-Motion, the program attracted nearly 100 international participants from more than 20 countries.
- Two TRB Annual Meeting sessions and a summer workshop explored options for expanding the public sector's use of supply chain data. The workshop defined the potential benefits—as well as the challenges—of using the data to link transportation infrastructure to the economy.
- With budget pressures threatening the Census Bureau's continuation of the Economic Census, a summer workshop examined the value of the data for many freight and passenger transportation applications.

Research and Education

The five Research and Education Section standing committees worked to improve transportation research methods, coordination of critical research, and dissemination of the results. At the 2012 TRB Annual Meeting, the committees conducted the following workshops:

- Back to Basics: Fostering and Nurturing Research Agendas for TRB Standing Committees;
- Information, Images, and Data: Practical Guidance for Using and Owning Intellectual Property; and
- Building the 21st Century Workforce: State of the Research in Assessing Effectiveness of Transportation Programs Aimed at Knowledge and Skill Building and Enhancement.

Cosponsored conferences included the following:

- The Council of University Transportation Centers Workforce Summit fostered a national dialogue on the needs and development of the transportation workforce, including the promotion of transportation careers in industry, government agencies, and academia.
- The International Transportation Research Information Access Workshop explored resources and practices in international transportation organizations for expanding TRID[1] and discussed innovative best practices for information sharing.

PLANNING AND ENVIRONMENT

Transportation System Planning

The 12 standing committees for planning had a busy 2012, with conferences and meetings and with sorting out the effects of the new surface transportation authorization, Moving Ahead for Progress in the 21st Century.

- The committees in the Travel Analysis Methods Section participated in planning the

[1] TRID is an integrated database that combines records from TRB's Transportation Research Information Services database and the Joint Transport Research Centre's International Transport Research Documentation database; see trid.trb.org.

Daniel Turner (*right*), University of Alabama, spoke at an Annual Meeting session on credentials for transportation professionals, hosted by the Young Members Council. (Photo: Risdon Photography)

Joan Calcagno, U.S. Institute for Environmental Conflict Resolution, discusses conflict management techniques at a session on public involvement in environmental justice communities. (Photo: Risdon Photography)

Fourth International Conference on Innovations in Travel Modeling in Tampa, Florida, in May.

- Later in May, the Statewide Multimodal Planning Committee and the Transportation Programming Committee assisted in developing the TRB–National Research Council (NRC) conference, "Making Progress: Transportation Planners and Programmers Turn Ideas into Reality," in Denver, Colorado.
- The Transportation Planning Committee held its summer meeting in Irvine, California, in conjunction with the National Scenario Planning Peer Exchange and the 13th National Conference on Transportation Planning in Small and Medium-Sized Communities.

Social, Economic, and Environment

To advance TRB's research initiatives, the committees in the Social, Economic, and Environment Sections jointly developed research problem statements, collaborated on Annual Meeting calls for papers and workshop proposals, and held summer meetings with other TRB groups and sections.

- A new Joint Subcommittee on Health and Transportation organized a 2012 Annual Meeting workshop on "The Intersection of Health and Transportation: What We Do and Don't Know, and How to Integrate Health Considerations into Transportation Decisions."
- The summer meeting featured in-depth discussions and updates on the U.S. Environmental Protection Agency's Motor Vehicle Emissions Simulator, quieter pavement technologies, maintenance practices for historic bridges, and sustainable resource management.
- The Transportation and Air Quality Committee worked with the South Coast Air Quality Management District, a TRB sponsor, to develop a forum in Washington, D.C., on adopting cleaner transportation and energy technologies. Congressional, industry, and association representatives discussed ongoing efforts and needs.
- The Special Task Force on Climate Change and Energy facilitated the publication of a new web circular, *Climate Change and Transportation: Summary of Important Information,*[2] and assembled a special issue of *TR News* on state and local innovations in climate change mitigation and adaptation.[3]
- In addition, the Special Task Force membership assisted in developing the TRB-NRC Spotlight Conference on Sustainable Energy and Transportation for the University Transportation Centers in November.

The Special Task Force on Climate Change and Energy developed the web circular *Climate Change and Transportation: Summary of Important Information* and coordinated a *TR News* theme issue on climate change adaptation.

DESIGN AND CONSTRUCTION

Design

Many of the standing committees in the Design Section met to discuss research needs, priorities, and the deployment of research findings.

- The Rigid Pavement Design and Portland Cement Concrete Pavement Construction Committees held a joint meeting in June in Salt Lake City, Utah.
- The Roadside Safety Design Committee's Subcommittee on International Research Activities met July 17 in Milan, Italy, with more than 100 participants from 20 countries convening for presentations on best practices and strategies to reduce fatal and serious injury crashes in the United States, Europe, Australia, and Turkey.
- The Roadside Safety Design Committee met with the AASHTO Technical Committee on Roadside Safety, July 29 through August 2 in Irvine, to discuss strategies for preventing roadside departure crashes and to learn about

[2] Circular E-C164, http://onlinepubs.trb.org/onlinepubs/circulars/ec164.pdf.

[3] *TR News*, July–August 2012, http://onlinepubs.trb.org/onlinepubs/trnews/trnews281.pdf.

At an Annual Meeting session hosted by Design and Construction Group committees, Daniel Byram, University of Arkansas, Fayetteville, shares research on sensitivity analysis of climatic influence on *Mechanistic–Empirical Design Guide* performance predictions with Vincent DiFrances, University of Wisconsin, Milwaukee. (Photo: Risdon Photography)

updates to the AASHTO *Roadside Design Guide*.

- The Full-Scale Accelerated Pavement Testing Committee cosponsored the 4th International Conference on Accelerated Pavement Testing, September 19–21 in Davis, California.

Construction and Materials

TRB standing committees in the Construction, Asphalt Materials, and Concrete Materials Sections focused on such emerging topics and current issues as alternate binders for sustainable asphalt pavements, moisture damage to hot-mix asphalt mixtures, increasing the percentage of reclaimed asphalt pavement, testing emulsified asphalts, open-graded asphalt mixtures, nanotechnology in concrete materials, portland–limestone and slag cements, internal curing of concrete, pavement materials and the urban climate, texturing concrete pavements for friction and noise abatement, sustainability in bridge construction, alternate technical concepts in design–build, best value in project procurement, project risk management, accelerated construction, and the fostering of small business participation.

Noteworthy accomplishments by the committees include the publication of four electronic circulars:

- *Polyphosphoric Acid Modification of Asphalt Binders: A Workshop*[4];
- *Applications of Advanced Models to Understand Behavior and Performance of Asphalt Mixtures*[5];
- *Alternative Binders for Sustainable Asphalt Pavements: Papers from a Workshop*[6];
- *Nanotechnology in Concrete Materials: State of the Art.*[7]

Geotechnical Engineering

In addition to addressing general issues, Geotechnical Engineering Section committees collectively focused on concerns related to geologic hazards, asset management, infrastructure foundation, aggregates, environment, and susceptibility. Among the noteworthy accomplishments of the committees were the following:

- Publication of *Rockfall: Characterization and Control,* 650-plus pages with a DVD of field research videos; organization of a symposium to discuss the relationship between the design and construction of rockfall mitigation techniques; and cosponsorship of the 11th International and 2nd North American Landslides Conference;
- Organization of a session on geotechnical asset management at the TRB 9th National Conference on Asset Management;
- Dissemination of information from the TRB 10th International Conference on Low-Volume Roads, held in 2011, through sessions, webinars, and publication of an electronic circular, *The Promise of Rural Roads*[8]; and
- Annual Meeting sessions on natural and recycled materials that affect pavement performance, advancing quality in geoengineering, and the environmental impact of construction materials.

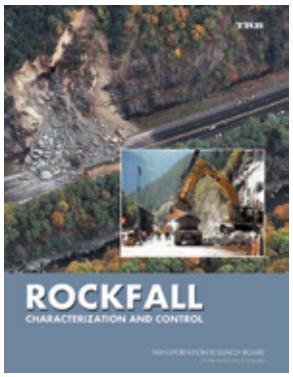
[4] Circular E-C160, http://onlinepubs.trb.org/onlinepubs/circulars/ec160.pdf.

[5] Circular E-C161, http://onlinepubs.trb.org/onlinepubs/circulars/ec161.pdf.

[6] Circular E-C165, http://onlinepubs.trb.org/onlinepubs/circulars/ec165.pdf.

[7] Circular E-C170, http://onlinepubs.trb.org/onlinepubs/circulars/ec170.pdf.

[8] Circular E-C167, http://onlinepubs.trb.org/onlinepubs/circulars/ec167.pdf.



Rockfall: Characterization and Control was published in 2012—a 650-page text with a DVD of video clips by researchers.

High-occupancy toll lanes and other managed lanes were subjects of programs organized by Traffic Operations Section committees in 2012; other key topics included traffic flow theory, highway capacity, and suburban and urban street design practices. (Photo: Washington State DOT)

OPERATIONS

The 13 standing committees of the Traffic Operations Section were involved in several major programs. The 14th International Managed Lanes Conference, held in Oakland, California, sought to advance the state of the art for managed lanes and pricing strategies, as well as the evolution of high-occupancy vehicle lanes into high-occupancy toll and managed lanes, to address metropolitan mobility and accessibility.

At the 1st International Symposium on Innovations in Traffic Flow Theory and Highway Capacity, held in Fort Lauderdale, Florida, participants from 12 countries shared their knowledge, expertise, and experience to facilitate innovation in traffic flow and capacity analysis. The 4th Urban Street Symposium in Chicago, Illinois, in June, explored improvements in suburban and urban street design practices, discussed alternative practices, and facilitated the transfer of research findings to state agencies and local governments.

MAINTENANCE AND PRESERVATION

The 13 standing committees in the TRB Maintenance and Preservation Section sponsored a variety of workshops and sessions during the 2012 TRB Annual Meeting:

- Maintenance in Lean Times; Maintenance Outsourcing and Performance Management; Climate Change and Sustainability;

Bruce V. Johnson, Oregon DOT, discusses the status of the Long-Term Bridge Performance Program at an Annual Meeting session. (Photo: Risdon Photography)

Annual Meeting sessions hosted by the Maintenance and Preservation Section committees examined work zone safety and mobility, driver behavior in work zones, and other topics. (Photo: Minnesota DOT)

- Pavement Preservation Treatments, Timing and Integration with Pavement Management; and Effectiveness of Joint Seals;
- Bridge Performance Measures and Communicating Metrics to the Public; Evaluation and Repair of Concrete Bridge Deterioration; Structural Health Monitoring; Bridge Management Within Highway Asset Management; the Federal Highway Administration's Long-Term Bridge Performance Program; and Managing Infrastructure Corrosion;
- Traffic Sign Minimum Retroreflectivity and Pavement Marking Presence; Pavement Marking Visibility and Retroreflectivity Under Wet Conditions; Traffic Operations in Adverse Weather; Work Zone Safety and Mobility; and Improving Driver Understanding and Behavior in Work Zones; and
- Selecting Efficient and Sustainable Winter Maintenance Chemicals and Practices; Understanding Traffic Mobility and Safety Benefits of Winter Maintenance; Management of Maintenance Equipment in DOTs; and Advances in Winter Maintenance Equipment.

SAFETY

The Safety and System Users Group consists of 21 standing committees in three sections: Safety, Users Performance, and Pedestrians and Bicycles.

Research in safety continued to expand with more than 600 papers submitted for peer review in 2012. Pedestrian and bicycle research similarly increased, with more than 150 papers submitted.

Of the 21 safety committees, four held mid-year meetings at Woods Hole, Massachusetts, or Irvine; four met in Washington, D.C.; and three convened in conjunction with other conferences. The use of virtual meeting technology doubled participation at these meetings. The production of DVD proceedings, including audio and video of presentations, along with papers, further expanded the audiences for the conferences.

The Pedestrian and Bicycle Transportation Committees produced the well-received *TR News* theme issue on the active transportation modes.[9] Another theme issue of the magazine featured new tools and initiatives for improving highway safety.[10]

Safety knowledge engineer Michael Perel shared insights into popular and media depictions of highway safety at the Human Factors Workshop Luncheon, hosted by the Safety and Systems Users Group. (Photo: Risdon Photography)

LEGAL RESOURCES

The seven standing committees within the Legal Resources Group focused on cooperating and coordinating with other standing committees on issues of legal concern. The committees also provided input to legal research efforts and information to practitioners of transportation law.

The Torts and Risk Management Committee maintained liaison with the safety committees on the implementation and revision of the *Highway Safety Manual,* monitoring legal issues related to the 2009 edition of the *Manual on Uniform Traffic Control Devices,* and cosponsoring a workshop on geometric design at the 2012 TRB Annual Meeting. In cooperation with the History Committee, the Transportation Law and the Transit and Intermodal Transportation Committees sponsored an historic review of the ruling in *Citizens to Preserve Overton Park v. Volpe* and its effect on transportation programs.

In addition, committees in the section continued to provide research ideas and advice on the agendas for the National Cooperative Highway Research Program's Legal Problems Arising out of Transportation Programs and for the Transit Cooperative Research Program's Legal Aspects of Transit Programs.

The Legal Resources Group provided practical information and continuing legal education for 135 participants at TRB's 51st Annual Workshop on Transportation Law in New Orleans, Louisiana, July 15–18.

[9] *TR News*, May–June 2012, http://onlinepubs.trb.org/onlinepubs/trnews/trnews280.pdf.

[10] *TR News*, September–October 2012, http://onlinepubs.trb.org/onlinepubs/trnews/trnews282.pdf.

Committees in the Safety and System Users Group produced two theme issues of *TR News* in 2012—one on bicycles and pedestrians and one on highway safety.

The Legal Resources Group sponsored an Annual Meeting session on legal and other challenges to megaprojects. (Photo: Risdon Photography)

AVIATION

Aviation Group committees held several midyear meetings to give practitioners an opportunity to discuss aviation industry developments and updates:

- The Environmental Impacts of Aviation committee met to discuss climate change mitigation and adaptation strategies and advances in alternative aviation fuels.
- The Aviation System Planning Committee's 8th national symposium in Galveston, Texas, explored federal, regional, and state aviation system planning initiatives.
- The Airfield and Airspace Capacity and Delay Committee discussed advances in NextGen technologies and funding in Washington, D.C.
- The subcommittees of the Light Commercial and General Aviation Committee also met in Washington, D.C., to review the state of the market domestically and internationally for business aircraft and civil helicopters, as well as adjustments by regional airline fleets in response to fluctuating fuel prices.

Michael McNerney, Federal Aviation Administration, led a session on implementation of the agency's Airports Geographic Information System program. (Photo: Risdon Photography)

FREIGHT SYSTEMS

The TRB Freight Systems Group—10 standing committees and 3 task forces—organized Freight Day sessions with the Marine Group and the Freight Rail Transportation Committee at the 2012 Annual Meeting. Several sessions highlighted National Cooperative Freight Research Program projects, and one focused on recently completed projects from the Hazardous Materials Cooperative Research Program.

The Freight Systems Group held a midyear meeting in June in Washington, D.C., with nine committees participating. The well-attended event included interactive general sessions on supply chain industry trends, alternative fuels, food logistics, modal issues in the transport of hazardous materials, and freight infrastructure funding. The new Task Force on Disaster Response and Business Continuity held its first official meeting in the nation's capital.

The Truck Size and Weight Committee and the Trucking Industry Research Committee met in Milwaukee, Wisconsin, in July, in conjunction with the meeting of AASHTO's Subcommittee on Highway Transport. The Freight Systems Group is collaborating with the Planning Group and the Marine Group, to leverage expertise in freight systems and transportation planning.

MARINE

In addition to the four standing committees in the TRB Marine Group, TRB administers the National Research Council's Marine Board, an internationally recognized source of expertise on maritime transportation and marine engineering and technology. In response to requests from sponsoring agencies or on its own initia-

David L. Damm-Luhr, Volpe National Transportation Systems Center, participated in a meeting of the Urban Freight Transportation Committee, part of the Freight Systems Group. (Photo: Risdon Photography)

The executive boards of the Freight Systems Group and the Marine Group gathered for a joint meeting in January. (Photo: Risdon Photography)

tive, the Marine Board serves the national interest by fostering studies and other activities to enhance the ability of the nation's marine and maritime industries to operate safely, efficiently, and in an environmentally responsible manner.

In June, the Marine Board and the Marine Transportation System Committee cosponsored a conference on Diagnosing the Marine Transportation System: Measuring Performance and Targeting Improvement. With the Waterways Association of Pittsburgh, the Marine Board cosponsored the Joint Conference of Harbor Safety and Area Maritime Security Committees in August, focusing on America's Maritime Infrastructure: Investing for Safety, Security, and Prosperity.

The Marine Board's Spring Meeting in Washington, D.C., in May featured presentations and discussions with agency sponsors. In October, in conjunction with its Fall Meeting in Seattle, the Board hosted a two-day TRB-NRC workshop on Safe Navigation in the Arctic.

The TRB Executive Committee conducted a special session on inland waterway issues at its January 2012 meeting and approved a scope of work for a policy study on inland waterways.

PUBLIC TRANSPORTATION

At the 2012 TRB Annual Meeting, the 16 standing committees in the TRB Public Transportation Group conducted 39 meetings, 35 lectern sessions, 12 poster sessions, and four workshops, several in conjunction with the Transportation Demand Management Committee and the Accessible Transportation and Mobility Committee. Committees in the group peer-reviewed research papers and made selections for publication in five volumes of the TRR. Midyear meetings and conference development included the following:

- The first transit track for the 9th National Conference on Asset Management, in San Diego, California, in April;
- The Fifth National Bus Rapid Transit Conference, including a technical tour, in Las Vegas, Nevada, in August;

Stephanie Camay, URS Corporation, shared research findings about New York's East River Ferry at the Annual Meeting. (Photo: Risdon Photography)

Steven Silkunas, Public Transportation Group chair, presented a committee service award to Victoria Perk, University of South Florida, at the Transit Caucus in January. (Photo: Risdon Photography)

- TRANSED 2012: 13th International Conference on Mobility and Transport for Elderly and Disabled People, in New Delhi, India, in September;
- The National Conference for Rural Public and Intercity Bus Transportation, with the theme, Connecting Communities: Sharing Solutions, in Salt Lake City, Utah, in October; and
- The 12th National Light Rail Conference, also in Salt Lake City, on Sustaining the Metropolis: Light Rail Transit and Streetcars for Super Cities, in November.

Conrad Ruppert, University of Illinois, Urbana–Champaign, explained second-generation advanced design turnout at an Annual Meeting session sponsored by the Railroad Track Structure System Design and Railway Maintenance standing committees. (Photo: Risdon Photography)

RAIL

The eight standing committees in the Rail Group participated in the following activities:

- The 2012 Joint Rail Conference, cosponsored by TRB;
- The launch of the Joint Subcommittee on Transit State of Good Repair, under the Rail Transit Infrastructure Committee and committees in the Public Transportation Group;
- 2012 Annual Meeting sessions and workshops on an array of topics, including high-speed rail turnouts, rail security, freight rail innovation, transit state of good repair, and passenger rail finance;
- The development and submittal of problem statements for consideration by the newly inaugurated National Cooperative Rail Research Program, which met in May to select projects; and
- Preliminary planning and work on a special theme issue of *TR News* on the role of science and technology in advancing the rail industry, scheduled for May–June 2013.

Staff News

Two new Senior Program Officers joined the staff this fall: **BERNARDO B. KLEINER**, with responsibilities in the Safety and Systems Users areas, and **SCOTT BROTEMARKLE**, with responsibilities in the marine areas.

Two long-time staffers gained new roles: **MICHAEL A. DeCARMINE** was promoted to Program Officer, and **JULIE A. MILLER** was appointed Manager of Marketing and Sales.

Also hired to the Technical Activities Division in 2012 were **MEGAN E. BURNS**, Meetings Coordinator; **MICHAEL NABINETT**, Senior Program Assistant; **MAI QUYNH LE**, Program Associate; and **HAE-IN LIM**, Senior Program Assistant.

Major awards presented in 2012

J. Barry Barker (*right*, with Sandra Rosenbloom), Executive Director of the Transit Authority of River City (TARC) in Louisville, Kentucky, received the Sharon D. Banks Award for humanitarian leadership in transportation. Throughout his more than 30 years of service in public transportation, Barker has displayed a commitment to improve transportation access for the poor, elderly, and persons with disabilities, as well as a management approach focused on the travel and access needs of TARC's customers. He has been recognized with awards from the Louisville Urban League, the Kentucky Council for the Blind, the Paralyzed Veterans of America, Easter Seals, and NAACP. Before joining TARC in 1994, Barker worked at METRO Regional Transit Authority in Akron, Ohio, and at the Greater Cleveland Regional Transit Authority. He is an active member of TRB committees, including the Executive Committee, the Transit Research Analysis Committee, and several Transit Cooperative Research Program panels.

The W. N. Carey, Jr., Distinguished Service Award for outstanding service to transportation research and TRB was presented to **Adib K. Kanafani**, Professor of the Graduate School at the University of California (UC), Berkeley. Kanafani was recognized for his pragmatic leadership in policy and strategic planning for TRB and for his major contributions to the work of TRB's Executive Committee and its subcommittees, as well as to many policy studies and standing committees. He served as chair of the Executive Committee in 2009 and subsequently chaired the Subcommittee on Planning and Policy Review. Kanafani began working at UC Berkeley in 1970 and in 1997 was founding codirector of the National Center of Excellence for Aviation Operations Research. From 1983 to 1988, he was director of UC Berkeley's Institute of Transportation Studies and served as chair of the Department of Civil and Environmental Engineering and as Edward G. and John R. Cahill Professor of Civil Engineering. He was elected to the National Academy of Engineering in 2002.

Joseph L. Schofer (*right*, with Neil J. Pedersen), Professor of Civil and Environmental Engineering at Northwestern University, received the Roy W. Crum Distinguished Service Award for achievement in transportation research. Schofer was honored for his important, wide-ranging contributions to the planning and management of transportation systems, particularly the provision and use of data and information for effective decision making, decision support for infrastructure preservation and rehabilitation, and transportation policy. A member of Northwestern's faculty since 1970, he is Associate Dean of the Robert R. McCormick School of Engineering and Applied Science and Director of the Infrastructure Technology Institute. Schofer has chaired and served on numerous TRB standing committees, policy study committees, expert task groups, and project panels over the past 40 years.

The Thomas B. Deen Distinguished lectureship recognized the career contributions of **William W. Millar** (*below*, with Deen), who retired in 2011 after 15 years as President of the American Public Transportation Association. His 40-year transportation career included 19 years with the Port Authority of Allegheny County, the principal transit operator serving Pittsburgh, Pennsylvania, and several years with the Pennsylvania Department of Transportation. Millar founded Pittsburgh's award-winning ACCESS paratransit service and developed Pennsylvania's Free Transit Program for Senior Citizens. He also was a member of the TRB Executive Committee from 1988 to 2011, serving as chair in 1992.

Studies and Special Programs

Adib K. Kanafani
Chair
Subcommittee on Planning and Policy Review

Stephen R. Godwin
Director
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 for sponsors; produces syntheses of current practices in highway, transit, and airport operations, and manages Innovations Deserving Exploratory Analysis (IDEA) programs in highways, transit, and rail safety.

POLICY STUDIES

With the guidance of committees drawn from the nation's leading experts, the Policy Studies unit 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. In addition, studies conducted through TRB's Marine Board may address offshore engineering and regulatory issues not directly related to transportation.

The Executive Committee's Subcommittee on Planning and Policy Review, which oversees the policy work of TRB, met in November.

TRB's parent organization, the National Research Council (NRC), appoints the study committees to achieve a balance of expertise and perspectives. 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 TRB Executive Committee's Subcommittee on Planning and Policy Review provides oversight for TRB's policy work, under the leadership of former Executive Committee Chair Adib K. Kanafani, University of California, Berkeley. Since 1998, all completed policy study reports are posted on the TRB website.[1]

COMPLETED REPORTS

A study conducted under the auspices of the Marine Board produced TRB Special Report 309, *Evaluating the Effectiveness of Offshore Safety and Environmental Management Systems*, which was released in June.[2] The study committee recommends that the Bureau of Safety and Environmental Enforcement (BSEE) of the U.S. Department of the Interior take a holistic approach to evaluating the effectiveness of offshore oil and gas industry operators' Safety and Environmental Management Systems (SEMS) programs.

According to the report, this approach, at a minimum, should include inspections, audits by the operator and BSEE, key performance

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

[2] http://onlinepubs.trb.org/onlinepubs/sr/SR309.pdf.

The Committee for Review of the Federal Railroad Administration Research, Development, and Demonstration Programs hosted a session with FRA and key stakeholders in May.

indicators, and a whistleblower program. SEMS is a safety management system (SMS) aimed at shifting from a largely prescriptive regulatory approach to one that is proactive, risk based, and goal oriented in an attempt to improve safety and reduce the likelihood of events similar to the April 2010 Macondo well incident.

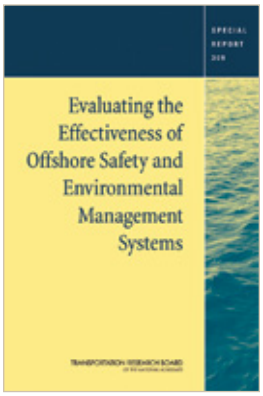
According to the committee that produced the report, it is not possible for a regulator to create a culture of safety in an organization by inspection or audit; a safety culture needs to come from within the organization. To be successful, the tenets of SEMS must be fully acknowledged and accepted by workers, motivated from executive management, and supported throughout the organization; the tenets must drive workers' actions.

The report also notes that the way BSEE measures and enforces SEMS can encourage and aid the industry in developing a culture of safety. The committee believes that BSEE should seize the opportunity to make a step change in safety culture by adopting a goal-based holistic approach in evaluating the effectiveness of SEMS programs.

In tracing out a holistic approach, the report explores SEMS' role in helping to develop a culture of safety, highlights the pros and cons of various assessment methods, and investigates the approaches used for assessing SMS programs by other U.S. and international regulatory agencies with safety mandates similar to those of BSEE.

BSEE funded the study. Kenneth A. Arnold, WorleyParsons, Inc., chaired the committee.

The Policy Studies unit also supports committees conducting ongoing peer reviews of research and development programs of the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), and the Federal Railroad Administration (FRA), as well as reviews of major research projects, such as FHWA's Long-Term Pavement Performance program and Long-Term Bridge Performance program. The committees that conduct these reviews issue their findings and recommendations in letter reports.[3]

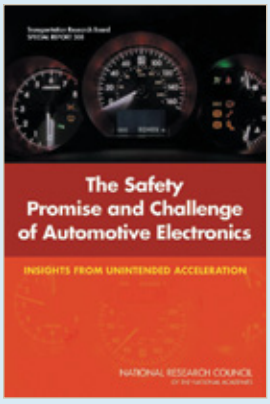


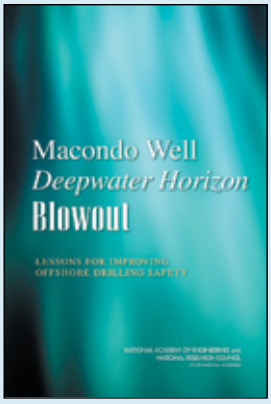
New and Ongoing Studies

- The TRB Executive Committee initiated **Economic and Employment Benefits of Highway Investments in Response to**

[3] www.trb.org/Publications/PubsPolicyStudiesLetterReports.aspx.

TWO POLICY STUDIES released on the web in late 2011 were published in print early this year: TRB Special Report 308, *The Safety Promise and Challenge of Automotive Electronics: Insights from Unintended Acceleration*, with the Board on Energy and Environmental Systems and the Computer Sciences and Telecommunications Board; and *Macondo Well–Deepwater Horizon Blowout: Lessons for Offshore Drilling Safety*, a report of the National Academy of Engineering, the NRC Board on Environmental Studies and Toxicology, and TRB's Marine Board, published by National Academies Press (www.nap.edu).





Sankara Papavinasam, CanmetMATERIALS, delivered a presentation at a meeting of the Committee for a Study of Pipeline Transportation of Diluted Bitumen. The study was requested by the Pipeline and Hazardous Materials Safety Administration.

Economic Downturns: A Scoping Study to examine the economic benefits of countercyclical investments in transportation infrastructure in response to economic downturns. The National Cooperative Highway Research Program (NCHRP) and TRB are funding the study. Therese McGuire, Northwestern University, chairs the committee.

- **Intercity Passenger Travel: Opportunities and Issues in Short-Haul Markets** also was initiated by the Executive Committee and is funded by TRB. Martin Wachs, University of California, Los Angeles (UCLA), and RAND Corporation, is the committee chair.
- The Department of the Interior's Bureau of Ocean Energy Management and BSEE have sought the advice of TRB's Marine Board on another project, **Offshore Wind Farm Worker Safety**. The chair is James Card, Vice Admiral (ret.), U.S. Coast Guard.
- The Pipeline and Hazardous Materials Safety Administration requested a study of **Pipeline Transportation of Diluted Bitumen** in response to concerns about the risks of release. The committee chair is Mark Barteau, University of Michigan.
- **Review of FTA's Transportation Economic Requirements Model (TERM)** is providing a peer review of TERM at the agency's request. Brian Taylor, UCLA, chairs the committee.
- **Review of the Federal Aviation Administration's (FAA's) Air Traffic Control Staffing Model**, undertaken at the request of Congress, is assessing the assumptions and projections of the agency's staffing model for estimating the number of air traffic controllers needed in the future. FAA is funding the study; the committee is chaired by Amy Pritchett, Georgia Institute of Technology.
- **International Models of Research Processes and Frameworks** is a project funded by NCHRP in response to findings from a 2008 international scanning tour of innovative research program management. Sue McNeil, University of Delaware, chairs the committee.

In addition, the Policy Studies staff is assisting the U.S. Maritime Administration by arranging for reviews of the agency's ongoing study of the possible impacts of the Panama Canal expansion on U.S. ports and freight movements. The staff also is assisting NRC's Board on Energy and Environmental Systems on three projects: evaluating fuel conservation technologies for light-duty vehicles and medium- and heavy-duty trucks, both for the National Highway Traffic Safety Administration; and studying options for funding electric vehicle recharging stations, for the U.S. Department of Energy.

To meet state goals for electric vehicle use, Hawaii is aiming for 200 public charging units at more than 80 locations around the islands by the end of 2012. TRB and NRC's Board on Energy and Environmental Systems have begun a study on options for funding electric vehicle recharging stations for the U.S. Department of Energy. (Photo: National Renewable Energy Laboratory, U.S. Department of Energy)

Studies and Special Programs Director Stephen R. Godwin (*left*), and Andrew Meier, ARRB Group, Ltd., at a signing ceremony in September that added more than 100,000 records from the Australian Transport Index (ATRI) to the TRID Database. ATRI will add more than 4,000 new records into the system each year.

INFORMATION SERVICES

Transportation Research Information Services

In January 2012, one year after it was launched, TRID—the combination of TRB's Transportation Research Information Services database and the International Transport Research Documentation[4] (ITRD) database—served more than 1 million unique visitors from nearly every country in the world.

TRID is a comprehensive bibliographic database of citations and abstracts of transportation research in all modes and disciplines.[5] TRID contains more than 950,000 records of published or ongoing research in English, German, French, or Spanish; more than 72,000 records link to full-text publications. The service offers simple and advanced searching and allows users to download, e-mail, and share results via social media. TRID is available free of charge on TRB's website.

Publications Index

The TRB Publications Index includes citations and abstracts for all TRB, Highway Research Board (HRB), Strategic Highway Research Program (SHRP), and Marine Board publications since 1923.[6] The index offers simple and advanced searching and allows users to download and e-mail the results in a variety of formats. Records contain links to available full-text documents and to ordering information.

Research Needs Statements Database

The Research Needs Statements (RNS) database is a dynamic collection developed by TRB technical standing committees to reflect highest-priority topics.[7] The RNS database serves as a tool for reviewing research needs, setting research priorities, and identifying gaps in current research. More than 1,000 statements are posted.

Research in Progress Database

Research in Progress (RiP) is a database of approximately 10,000 records of active or recently completed research projects.[8] The current awareness service notifies users about new and updated project records in specified subject areas. The database contains international project records from ITRD's Transport Research in Progress Database. TRID offers users an interface for searching the RiP database.

TRB Library

The TRB library provides research and reference services to TRB sponsors, committee members, and staff. The library subscribes to more than 400 serial titles and contains the complete collection of TRB, HRB, SHRP, and Marine Board publications.

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

SYNTHESIS PROGRAMS

Under the sponsorship of the Cooperative Research Programs administered by TRB—specifically the Airport Cooperative Research Program (ACRP), NCHRP, and the Transit Cooperative Research Program (TCRP)—the Synthesis Programs unit prepares reports on current practice and knowledge for a range of

Librarian Jessica Fomalont (*foreground*) and database librarian William B. McLeod arrange volumes in the stacks to maximize capacity.

[4] ITRD is a project of the Joint Research Center of the International Transport Forum and the Organisation for Economic Co-operation and Development.

[5] http://trid.trb.org.

[6] http://pubsindex.trb.org.

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

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

key airport, highway, and transit topics. Practitioners and researchers make extensive use of the reports.

An airport panel, a highway panel, and a transit panel select the study topics each year. In 2012, the panels selected 14 new highway, 6 new transit, and 11 new airport studies. A consultant experienced in the topic area researches and writes each Synthesis report, with guidance from an expert panel.

A list of reports published in the past 12 months appears on pages 53–56. Approximately 2,500 copies of each report are published in hard copy, and 2,300 of these are distributed to state departments of transportation (DOTs), transit agencies, airport operators, and TRB topic-area subscribers. The reports also are posted on the TRB website.[9]

TRB maintains an inventory of hard-copy Synthesis reports for sale.[10] Following are summaries of illustrative airport, highway, and transit reports published in 2012.

ACRP Synthesis Reports

- ACRP Synthesis 33, *Airport Climate Adaptation and Resilience,* by Joanne Landry and others, reviews the range of risks to airports from projected climate change and describes emerging approaches for handling these risks.
- ACRP Synthesis 37, *Lessons Learned from Airport Safety Management Systems Pilot Studies,* by Chris Baglin, provides airport operators with data and experience from airports participating in the SMS pilot studies. The report addresses the SMS program management; the design, development, and deployment of the SMS components; and the challenges and benefits of the SMS.

NCHRP Synthesis Reports

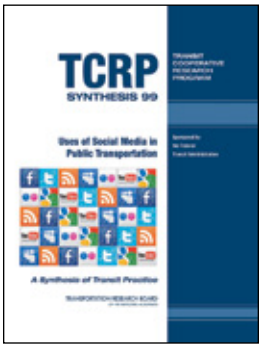
- NCHRP Synthesis 431, *Practices to Manage Traffic Sign Retroreflectivity,* by Jonathan M. Ré and Paul J. Carlson, was the subject of a TRB webinar sponsored by the Signing and Marking Materials Committee. The webinar drew an estimated 600 attendees at 240 sites; in a survey, 92 percent of respondents checked that they were "satisfied" or "very satisfied" with the program's content.
- NCHRP Synthesis 432, *Recent Roadway Geometric Design Research for Improved Safety and Operations,* by Marcus A. Brewer, was the subject of a TRB webinar sponsored by the Operational Effects of Geometrics Committee. The webinar attracted approximately 340 participants at 156 sites; 89 percent of the attendees indicated that they were satisfied or very satisfied with the session.
- NCHRP Synthesis 427, *Extent of Highway Capacity Manual Use in Planning,* by Richard G. Dowling and Aaron Elias, was the subject of a webinar sponsored by the Highway Capacity and Quality of Service Committee. The Synthesis indicated a need for a planning and preliminary engineering applications guide to the *Highway Capacity Manual*; the American Association of State Highway and Transportation Officials' Standing Committee on Research has endorsed development of the guide under the 2013 NCHRP program, with funding of $400,000.

Geometric improvements for road safety and operations in Tucson, Arizona, applied roadway design research described in NCHRP Synthesis 432 and presented in a related webinar. (Photo: Khang Nguyen, Kittelson & Associates)

TCRP Synthesis Reports

Webinars are planned for two TCRP Syntheses released in 2012:

- TCRP Synthesis 95, *Practices for Wayside Rail Transit Worker Protection*, by Christopher A. Kozub, examines representative agencies' successful wayside worker safety programs.



Transit agencies across the United States and Canada have begun implementing networking tools—blogs, Facebook, LinkedIn, Twitter, and more; TCRP Synthesis 99 explored best practices in the use of social media.

[9] www.trb.org/Publications/PubsNCHRPSynthesisReports.aspx; www.trb.org/Publications/PubsTCRPSynthesisReports.aspx; and www.trb.org/Publications/PubsACRPSynthesisReports.aspx.

[10] www.trb.org/Finance/Bookstore.aspx.

The report assists streetcar, light and heavy rail providers, and other stakeholders in developing or revising practices to protect track workers.

- TCRP Synthesis 99, *Uses of Social Media in Public Transportation,* by Susan Bregman, explores applications of social media, such as blogs, Facebook, LinkedIn, Twitter, Flickr, Foursquare, and MySpace, at six transit agencies in the United States and Canada.

IDEA 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.

Four IDEA programs were operating in 2012:

- 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 currently sponsors the Safety IDEA program, which supports projects to improve the safety of railroad operations.
- The Reliability IDEA program, funded by SHRP 2, supports projects to increase the consistency and dependability of travel times, improve the prediction of travel time, and inform travelers and other highway system users about dealing with unexpected delays.

Structure and Activities

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. IDEA projects are high-risk investigations of unproven concepts. Funds awarded for any one project range between $50,000 and $150,000. Frequently, however, IDEA funds are augmented through cost-share arrangements, nearly doubling the amount of research that can be supported through the IDEA programs.

Mark Sheppard of Tampa's HART transit system explains the Travel Assistance Device, a smartphone application developed with assistance from Transit IDEA. The application can help reduce expensive paratransit trips, as reported in a recent issue of *Ignition*, the magazine of TRB's IDEA programs. (Photo courtesy Sean Barbeau)

At the 2012 TRB Annual Meeting, the transit, highway, and safety programs conducted poster sessions highlighting 21 of the most promising current projects. Each session attracted a constant stream of interested visitors who interacted directly with the inventors.

Each of the IDEA programs publishes an annual report that includes summaries of completed and current projects. The summaries also are posted on the IDEA page of the TRB website, along with the IDEA program announcement, which contains forms and guidelines for submitting proposals.[11] Contractor final reports for completed IDEA projects also are posted on the TRB website.[12] A less formal publication, *Ignition,* features interviews with IDEA investigators and transportation leaders, plus articles that highlight promising projects.[13]

[11] www.trb.org/IDEAProgram/IDEAProgram.aspx.

[12] www.trb.org/Publications/PubsIDEAHighwayFinalReports.aspx; www.trb.org/Publications/PubsIDEAHighSpeedRailFinalReports.aspx; www.trb.org/Publications/PubsIDEASafetyFinalReports.aspx; and www.trb.org/Publications/PubsIDEATransitFinalReports.aspx.

[13] www.trb.org/Publications/PubsIDEAIgnitionMagazines.aspx.

Hybrid composite beams—developed with support from the NCHRP IDEA program—are used in the construction of the Knickerbocker Bridge in Boothbay, Maine. (Photo courtesy Dale Peabody, Maine DOT)

Exemplary Successes

Transit IDEA supported the development of an automated, in-ground rail wheel-gauge inspection system by International Electronic Machines Corporation (IEM). The device uses 3-D laser imaging technology, trackside cameras, and ultrasonic sensors to scan the entire cross section of a wheel to create a complete digital profile. The profile is processed by a software program that checks for wheel cracks, flange angle, wheel diameter changes, and other signs of wear.

CSX Corporation has purchased five rail–wheel inspection systems from IEM for railroad maintenance yards. New Jersey Transit also has purchased the system to inspect wheels on rail transit vehicles. In addition, IEM has built and installed the device for transit systems in Sydney, Australia, and Izmir, Turkey.

The hybrid composite beam (HCB) is a high-strength, lightweight, corrosion-resistant beam for bridge construction. The HCB has three main subcomponents: a fiber-reinforced plastic (FRP) shell; compression reinforcement with self-consolidating concrete, which is pumped into the beam shell; and tension reinforcement with steel fabrics along the bottom flanges of the beams.

The low density of the FRP materials, the reduced amount of concrete needed, and the ability to place the compression reinforcement on site contribute to an economical structural member that can be used in the framing system of a bridge in the same manner as a steel or prestressed concrete beam. The HCB, however, is much lighter and offers a potentially longer service life than steel or concrete and is well suited to accelerated bridge construction. Bridges in Illinois, Maine, New Jersey, Missouri, and Utah have been constructed with HCBs.

The HCB and inventor John Hillman have received the following recognitions: the American Council of Engineering Companies 2009 Grand Award, the *Engineering News Record* 2010 Award of Excellence, and the American Society of Civil Engineers 2013 Charles Pankow Award for Innovation.

Staff News

KATHERINE A. KORTUM, a 2011 National Academies Christine Mirzayan Science and Technology Policy Graduate Fellow, joined the Policy Studies unit as Associate Program Officer in May.

WILLIAM McLEOD joined the Information Services unit in June as Database Librarian, after 12 years as Research Librarian with the National Academies Research Center.

Database Administrator **SHIRLEY A. MORIN**, who was with TRB for more than 40 years, passed away in September, shortly after retiring.

Cooperative Research Programs

TRB administers six 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);
- The Hazardous Materials Cooperative Research Program (HMCRP), sponsored by the Pipeline and Hazardous Materials Safety Administration (PHMSA); and

Cooperative Research Programs Director Christopher Jenks updates the TRB Executive Committee on program activities and displays some of the more than 150 publications produced by the programs annually.

John S. Halikowski
Chair
AASHTO Standing Committee on Research

Keith Parker
Chair
TCRP Oversight and Project Selection Committee

Cheryl A. Burke
Chair
HMCRP Technical Oversight Panel

Lillian C. Borrone
Chair
NCFRP Oversight Committee

James A. Wilding
Chair
ACRP Oversight Committee

Howard R. Permut
Chair
NCRRP Oversight Committee

Christopher W. Jenks
Director
Cooperative Research Programs

Crawford F. Jencks
Deputy Director
Cooperative Research Programs

- The National Cooperative Rail Research Program (NCRRP), sponsored by the Federal Railroad Administration (FRA).

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

NCHRP is an applied research program that responds to the needs of state highway and transportation departments. NCHRP's close association with AASHTO and its position within the National Academies have enabled the program to carry out research with sound, practical, and nationally important results. Stakeholder involvement throughout the NCHRP process

John Halikowski, Arizona DOT, guides a meeting of the American Association of State Highway and Transportation Officials (AASHTO) Standing Committee on Research (SCOR) in March.

guarantees that the program addresses high-priority research needs and develops products that are ready for implementation by transportation practitioners. Founded in 1962, NCHRP is celebrating its 50th anniversary.

In that time, NCHRP has administered 2,747 research projects. More than 1,212 publications have appeared in the NCHRP Report and NCHRP Synthesis of Highway Practice series, in addition to 380 Research Results Digests and 57 Legal Research Digests, as well as 258 other documents published electronically. NCHRP research areas run the gamut from highway and bridge planning, materials, design, construction, and operations, to economics and finance, policy, land use, environmental issues, and workforce development.

Proven Process

Most NCHRP research projects have had a direct impact on practice through products such as recommended specifications, manuals, and guidelines. Examples of NCHRP successes can be found in the brochure, *NCHRP at 50 Years,*[1] and in the Impacts on Practice series.[2]

AASHTO considered 135 new problem statements for the fiscal year (FY) 2013 program. A total of 180 projects were under contract as of September 1, 2012, with 152 additional projects under development or awaiting contract. NCHRP reports published during the past 12 months are listed on pages 54–55.

Each NCHRP project 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 through 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.

Since 1962, NCHRP has administered more than 2,700 research projects and produced more than 1,200 reports and synthesis publications.

NCHRP panels convened for more than 133 project meetings in 2012; more than 2,475 volunteers offered their time, energy, and expertise as panel members, attending meetings and reviewing materials, primarily for the challenges and the satisfaction of making contributions to the field.

Following is a small sample of NCHRP projects completed in the past year that were of particular importance to AASHTO. All reports are available on the TRB website.[3] General information on all projects is available in the NCHRP Summary of Progress, December 31, 2012, and on the web.[4]

Sample of Recent Projects

NCHRP Report 708, *A Guidebook for Sustainability Performance Measurement for Transportation Agencies,* released in late 2011, describes the underlying principles of sustainability as applied to transportation and indicates how

Robert L. Sack, New York State DOT (*left*); Harold R. (Skip) Paul, Louisiana Department of Transportation and Development; and Floyd Roehrich, Arizona DOT, participate in the AASHTO SCOR meeting. SCOR identifies research needs and evaluates NCHRP projects.

[1] http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP_50thAnniversary.pdf.

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

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

[4] http://onlinepubs.trb.org/onlinepubs/nchrp/nchrpannual2012.pdf.

Members of the NCHRP project panel on Guidance for the Management of Traffic and Safety Assets conducted their first meeting in July.

to set goals that address the principles and to establish performance measures of progress toward the goals.

NCHRP Report 722, *Assessing Highway Tolling and Pricing Options and Impacts*, provides state DOTs and other transportation agencies with a decision-making framework and analytical tools that predict the likely impacts of tolls on revenue generation and system performance.

NCHRP Report 693 provides guidance for transportation agencies on *Attracting, Recruiting, and Retaining Skilled Staff for Transportation System Operations and Management.* The report reviews career paths, skill requirements, and training needs and identifies successful programs, state-of-the-art initiatives, and best industry practices.

NCHRP Report 726, *A Guidebook for Nighttime Construction: Impacts on Safety, Quality, and Productivity*, offers comprehensive guidelines for the conduct of nighttime highway construction and maintenance operations.

NCHRP Report 713, *Estimating Life Expectancies of Highway Assets, Volume 1,* assists in life-cycle cost analyses that support management decision making. Volume 2 describes the technical issues and data needs associated with estimating asset life expectancies and the practices that other fields—such as the energy and financial industries—have used to make these kinds of estimates.

Fuel consumption, tire wear, and repair and maintenance costs in relation to pavement condition are examined in NCHRP Report 720, *Estimating the Effects of Pavement Condition on Vehicle Operating Costs*. Computational software is available on an accompanying CD-ROM.

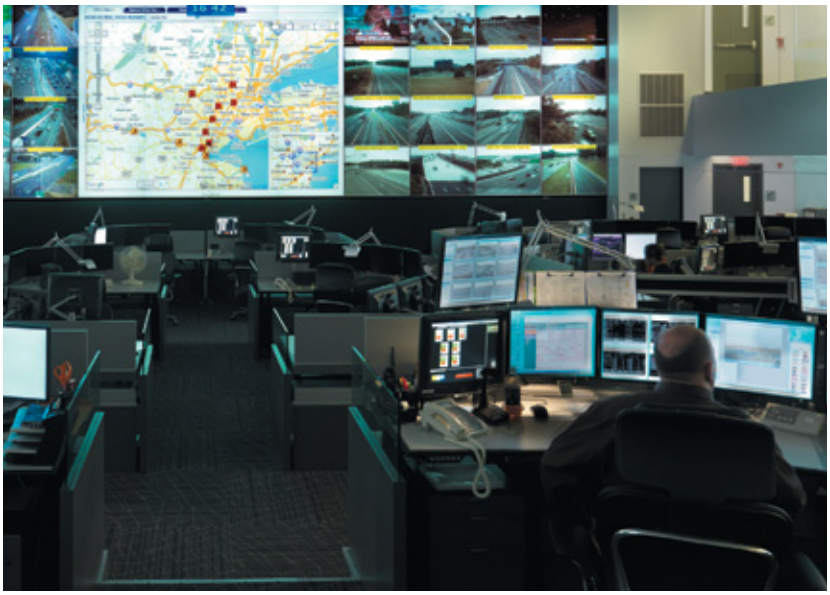
NCHRP Report 718 presents a *Fatigue Loading and Design Methodology for High-Mast Lighting Towers.* The project applied loading and analysis criteria to develop a series of proposed revisions to AASHTO's *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*.

NCHRP Report 600, *Human Factors Guidelines for Road Systems,* assists highway designers and traffic engineers who may not be expert in human factors to consider more effectively the roadway user's capabilities and limitations in the design and operation of highway facilities.

NCHRP Report 711 provides *Guidance for the Selection, Use, and Maintenance of Cable Barrier Systems*. A variety of cable barrier systems, both proprietary and generic, have been deployed, and the design differences among the systems contribute to variations in performance characteristics, implementation, and maintenance requirements.

The impacts of bottlenecks and interruptions on the flow of goods through the nation's major freight corridors and intermodal connectors, the dynamics of that flow in response to disruptions, and the economic impact on public and private entities that depend on that flow are the subject of NCHRP Report 732, *Methodologies to Estimate the Economic Impacts of Disruptions to the Goods Movement System.*

An example of improper roadway signs and geometrics. The second edition of NCHRP Report 600, *Human Factors Guidelines for Road Systems*, presents information on human factors for highway designers and traffic engineers.



The New Jersey Turnpike Authority's high-tech Traffic Management Center. NCHRP Report 693 offers practical guidance on training skilled staff for traffic operations and management. (Photo: New Jersey Turnpike Authority)

At the October meeting of the TCRP Oversight and Project Selection (TOPS) Committee, Therese W. McMillan, Federal Transit Administration (*left*); Sherry Little, Spartan Solutions, LLC; TOPS Chair Keith Parker, VIA Metropolitan Transit; and Chris Jenks, TRB, led the discussion on the selection of TCRP projects for fiscal year (FY) 2013.

NCHRP Report 735, *Long-Distance and Rural Travel Transferable Parameters for Statewide Travel Forecasting Models,* forthcoming in early 2013, shows how to apply transferable parameters to project personal long-distance travel and rural travel in statewide travel models and indicates the limitations of the method.

NCHRP Legal Research Digest 57, *Tort Liability Defense Practices for Design Flexibility,* focuses on cases that involve the exercise of discretion in design. The report provides a framework for determining potentially successful strategies for defending design decisions that follow the principles of context-sensitive solutions.

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 APTA. A three-way memorandum of agreement by FTA, TDC, and TRB outlines the program's operating procedures. In its 20 years, TCRP has undertaken 665 studies; of these, 591 have been completed and 74 are in progress.

TCRP receives submissions of research problem statements throughout the year and has considered approximately 2,600 since 1992. In early 2012, TCRP issued a call for FY 2013 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 56 problem statements for FY 2013.

TRB submits quarterly progress reports on TCRP to FTA, describing the work accomplished during the quarter and anticipated for the next period. Details on the program's progress since 1992 can be found in the 2012 TCRP Annual Report.[5]

TCRP project oversight panels develop requests for proposals, select contractors, and monitor the research. In 2012, TCRP panels held a total of 55 meetings, which involved approximately 400 professionals and represented more than 500 days of volunteer time. The TOPS Committee also met twice during the year.

TCRP published 28 project reports in 2012, bringing the total to almost 600 publications. The following TCRP publications of particular interest were completed during the year.

Transit Infrastructure

TCRP Report 155, *Track Design Handbook for Light Rail Transit, Second Edition,* provides guidelines and descriptions for the design of common types of light rail transit (LRT) track. Chapters address vehicles, alignment, track structures, track components, special trackwork,

[5] http://onlinepubs.trb.org/onlinepubs/tcrp/TCRPAnnual2012.pdf.

TCRP Report 155 explores the design of common light rail transit track types.

aerial structures and bridges, corrosion control, noise and vibration, signals, traction power, and the integration of LRT track into urban streets, as well as the construction and maintenance of LRT trackwork.

TCRP Synthesis 100, *Elevator and Escalator Maintenance and Safety Practices*, documents highly specialized elevator and escalator maintenance, safety practices, and passenger communication efforts at five U.S. transit agencies. The five agencies together operate 1,418 elevators and escalators at 850 rail stations and are part of an FTA-sponsored consortium to develop a training and apprenticeship program in transit elevator and escalator maintenance.

Transit Vehicles and Maintenance

TCRP Report 156, *Guidebook for Evaluating Fuel Purchasing Strategies for Public Transit Agencies*, helps public transit agency professionals identify and evaluate the risks and uncertainties related to fuel prices. The guide presents tools and techniques for minimizing the impact of uncertainties; defines and evaluates alternative, cost-effective fuel purchasing strategies for agencies of varying sizes; and provides a management framework to assist throughout the fuel purchasing process.

Operations and Safety

TCRP Report 151, *A Guide for Implementing Bus on Shoulder (BOS) Systems*, presents guidelines for the planning, design, and implementation of BOS operations along urban freeways and major arterials. BOS requires a closely coordinated partnership effort by transit agencies, state DOTs, metropolitan planning organizations, enforcement agencies, and FHWA.

TCRP Synthesis 95, *Practices for Wayside Rail Transit Worker Protection*, describes the state of the practice in wayside rail track worker protection, to assist transit agencies and other entities in developing successful safeguards.

Planning

TCRP Report 152, *Guidelines for Ferry Transportation Services*, examines the history and characteristics of ferry systems in North America and develops guidelines for planning, marketing, operating, and managing a ferry system as a component of the transportation network. Criteria are presented for evaluating the viability of proposed ferry services as a function of location, travel demand, and market conditions.

TCRP Report 153, *Guidelines for Providing Access to Public Transportation Stations*, provides a spreadsheet-based tool and a process for planning for access to high-capacity transit stations, including commuter rail, heavy rail, light rail, bus rapid transit, and ferry connections. The station access planning tool, on an accompanying CD-ROM, enables trade-off analyses between the access modes for different types of stations. The potential to increase transit ridership through transit-oriented development opportunities is also assessed.

TCRP Research Results Digest 105, *Summary of Research Findings: Assessing and Comparing Environmental Performance of Major Transit Investments*, offers promising criteria, metrics, and methods for assessing and comparing the environmental performance of major transit projects.

TCRP Web-Only Document 56, *Methodology for Determining the Economic Development Impacts of Transit Projects*, helps transit agencies assess the economic benefits from transit investments in addition to the land development stimulated by savings in travel time.

TCRP Report 153, *Guidelines for Providing Access to Public Transportation Stations*, contains a spreadsheet-based tool for station access planning.

Specialized Transportation

TCRP Report 154, *Developing, Enhancing, and Sustaining Tribal Transit Services: A Guidebook*, provides an overview of the tribal transit plan-

Northern Cheyenne Transit, the Northern Cheyenne Tribe's first-ever transit system, was founded in 2009. The tribal transit planning process is explored in TCRP Report 154, *Developing, Enhancing, and Sustaining Tribal Transit Services*.

ning process, as well as step-by-step guidance for planning and implementing a tribal transit system, whether starting new or enhancing or sustaining services.

Marketing

TCRP Synthesis 99, *Uses of Social Media in Public Transportation*, explores and documents successful practices in the United States and Canada. Social media are defined as a group of web-based applications that encourage users to interact with one another; examples include blogs, Facebook, LinkedIn, Twitter, YouTube, Flickr, Foursquare, and MySpace. Transit agencies are adopting these networking tools to provide transit information and gain customer feedback.

AIRPORT COOPERATIVE RESEARCH PROGRAM

The Vision 100—Century of Aviation Reauthorization Act established ACRP, and the program was reauthorized in the FAA Modernization and Reform Act of 2012. ACRP undertakes research and other technical activities in response to the needs of airport operators on issues involving administration, environment, legal matters, policy, planning, safety, security, human resources, design, construction, maintenance, and operations at airports. Under a memorandum of agreement signed with FAA in October 2005, ACRP is managed by the National Academies through TRB, in coordination with the American Association of Airport Executives, the Airports Council International–North America, the Airport Consultants Council, the National Association of State Aviation Officials, and Airlines for America; representatives of airport operating agencies provide oversight and governance.

ACRP carries out applied research on problems shared by airport operating agencies yet not adequately addressed in other research programs. The ACRP Oversight Committee (AOC), appointed by the U.S. Secretary of Transportation, met twice in 2012 and selected 21 new research projects and 6 continuation projects for the FY 2013 program. To date, the AOC has authorized 333 projects in a variety of subject areas.

Catherine M. Lang, Federal Aviation Administration, and other members of the ACRP Oversight Committee discussed the status of the program and airport-related research projects at a January meeting.

In 2012, ACRP issued 38 publications.[6] More than 600 individuals from the airport community participated on ACRP project panels, which held approximately 100 meetings and 50 conference calls during 2012 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 relevant to airport practitioners.

Disseminating ACRP research results to specific airport-practitioner audiences and assessing the value and utility of the results require a diverse and simultaneous set of activities. In July 2009, the AOC approved a dissemination project to achieve the following objectives: (*a*) increase awareness of and engagement with ACRP among targeted airport-practitioner audiences and foster and cultivate a group to assist in the dissemination of ACRP research results throughout the airport industry; (*b*) increase readership of publications and encourage practical application of ACRP products among practitioners in the airport industry; and (*c*) create methods and channels of feedback to ensure that ACRP research results are meeting the needs of airport industry practitioners and examine any exceptions. ACRP made significant progress in implementing dissemination activities in the past year.

ACRP released the following notable publications in 2012:

- ACRP Report 65, *Guidebook for Airport Irregular Operations (IROPS) Contingency Plan-*

ACRP research results are disseminated not only through publications but also through social media sites like LinkedIn.

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

ning, assists commercial passenger service airports of all sizes in developing, evaluating, and updating contingency plans for IROPS that may cause significant disruptions for customers. The guide presents ways of improving responses to customer care during an array of IROPS conditions and provides step-by-step templates for the preparation of contingency plans that include communications, collaboration, and coordination in addressing customer needs.

- ACRP Report 66, *Considering and Evaluating Airport Privatization*, is a guidebook for airport operators, policy makers, and other stakeholders considering and analyzing the potential advantages and disadvantages of various approaches to airport privatization. Presenting a range of privatization options, from service contracts to private airport ownership or development, the guidebook includes case studies conducted at airports in the United States and abroad.
- ACRP Report 67, *Airport Passenger Conveyance Systems Planning Guidebook*, provides a case study analysis of conveyance systems functioning in real time and describes best practices and specific design considerations for such components as escalators, elevators, moving walkways, and passenger-assist vehicles and carts. Decision-making frameworks are included to assist in implementation.
- ACRP Report 68, *Guidebook for Evaluating Terminal Renewal Versus Replacement Options*, supplies airport professionals, policy makers, and industry professionals with a step-by-step process for conducting a business-driven evaluation of competing options to renew or replace airport terminal facilities. Considerations include life-cycle cost; airside, landside, or terminal capacity in relation to passenger demand; the condition of the facilities; development risks; development schedule; changes in regulatory requirements; airline needs; operational constraints; tenant make-up; and the airport's business model. The process is repeatable and scalable.
- ACRP Report 69, *Asset and Infrastructure Management for Airports—Primer and Guidebook*, informs airport managers and staff about asset and infrastructure management affecting the operation of an airport. A primer for executive-level staff offers an overview of an asset and infrastructure management program and the benefits and costs of implementation. The guidebook presents examples from various airports and serves as a reference for integrating asset and infrastructure management at airports of all sizes in daily operations and longer-term planning.
- ACRP Report 73, *Airport-to-Airport Mutual Aid Programs,* provides a guide for establishing formal or informal mutual aid agreements between airports in the event of a communitywide disaster—such as a hurricane or earthquake—that requires outside support and assistance. The guidebook describes the benefits of an airport-to-airport mutual aid pro-

ACRP Report 73 includes Miami International Airport as a case study for mutual aid programs between airports. (Photo: Miami–Dade Aviation Department)

ACRP Report 67 presents a guidebook for planning and implementing moving walkways and other airport passenger conveyance systems. (Photo: Paul Lowry)

gram (MAP) and outlines the considerations in setting up a MAP.

- ACRP Legal Research Digest 15, *Compilation of State Airport Authorizing Legislation*, assembles, reviews, and summarizes information about airport-specific legislation for each state, including laws on establishing, developing, operating, expanding, and funding airports. The compilation focuses on legislation expressly applicable to public airports and compares and contrasts zoning and land use; purchasing authority; commercial operations; ground transportation, funding, and taxing authority; law enforcement; and sovereign immunity.
- ACRP Synthesis 37, *Lessons Learned from Airport Safety Management Systems Pilot Studies,* provides airport operators with data and experience assembled through surveys, drawing on lessons learned, general findings, and trends. The intended audience consists of airport operators certificated under U.S. Part 139; however, the results from the synthesis may be helpful to all airports.

NATIONAL COOPERATIVE FREIGHT RESEARCH PROGRAM

Authorized in 2005 under SAFETEA-LU, 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.[7] Annual funding had averaged $3.4 million per year; the Moving Ahead for Progress in the 21st Century Act (MAP-21), however, repealed NCFRP. All research contracts will be completed as planned within the next 30 months. The Freight Research Oversight Committee and staff from RITA and TRB are discussing additional closeout activities to summarize and conclude the program.

[7] www.trb.org/NCFRP/NCFRP.aspx.

Jack Wells, U.S. DOT, discussed possible freight research projects at a meeting of the Freight Research Oversight Committee in February.

A four-quadrant gate grade crossing treatment in Gardner, Illinois. NCFRP Report 16 provides guidance for protecting and preserving freight infrastructure and routes. (Photo: U.S. DOT)

The reports published in 2012 are listed on page 54; highlights include the following:

- NCFRP Report 14, *Guidebook for Understanding Urban Goods Movement*, assists in decision making to accommodate and expedite urban goods movement yet minimize the environmental impact and community consequences.
- NCFRP Report 16, *Preserving and Protecting Freight Infrastructure and Routes*, addresses decision makers involved in freight facility operations, freight transportation planning, and land use. Guidance is provided to avoid conflicting land uses and to mitigate existing conflicts.
- NCFRP Report 17, *Multimodal Freight Transportation Within the Great Lakes–Saint Lawrence Basin,* describes the multimodal freight transportation system within the binational region—comprising Minnesota, Wisconsin, Michigan, Illinois, Indiana, Ohio, Pennsylvania, New York, Ontario, and Quebec—and the freight system's importance to regional, U.S., and Canadian economies.

HAZARDOUS MATERIALS COOPERATIVE RESEARCH PROGRAM

The 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users authorized a pilot cooperative research program on hazardous materials transportation. HMCRP was initiated in September 2006 under the sponsorship of PHMSA to complement 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- to midterm time frames.[8] Annual funding averaged $1.1 million, but MAP-21 has provided no new funding beyond FY 2012, that is, beyond October 1, 2012. All research contracts will be completed as planned in the next 18 months. The HMCRP Technical Oversight Panel, along with staff from PHMSA and TRB, is discussing additional closeout activities to summarize and conclude the program.

Three reports were published in 2012:

- HMCRP Report 7, *Role of Human Factors in Preventing Cargo Tank Truck Rollovers,* analyzes the causes of the major driver factors that contribute to rollovers of cargo tank trucks and offers safety, management, and communication practices that can minimize or eliminate driver errors.
- HMCRP Report 8, *Evaluation of the Use of Electronic Shipping Papers for Hazardous Materials Shipments,* examines the challenges of electronic shipping papers as an alternative to the paper-based communication system for hazardous materials.
- HMCRP Report 9, *A Compendium of Best Practices and Lessons Learned for Improving Local Community Recovery from Disastrous Hazardous Materials Transportation Incidents,* is a resource for short- and long-term efforts to rebuild and revitalize affected communities. The goal of recovery planning is to provide for a near-seamless transition from emergency response activities to recovery operations to the debriefing of lessons learned, including restoration of utility services, reestablishment of transportation routes, the provision of food and shelter to displaced persons, environmental restoration, business continuity, and economic rebuilding.

[8] www.trb.org/HMCRP/HMCRP.aspx.

HMCRP Report 7 analyzes the causes of cargo tank truck rollovers and offers ways to reduce driver error. (Photo: ne014x, Flickr)

NATIONAL COOPERATIVE RAIL RESEARCH PROGRAM

Authorized by the Passenger Rail Investment and Improvement Act, NCRRP was initiated under TRB management in 2012 under the sponsorship of FRA.[9] The program will carry out applied research on problems that

- Address intercity rail passenger and freight rail services, including rail passenger and freight technologies and operating speeds, enhanced rail systems and infrastructure, and new high-speed, wheel-on-rail systems;
- Address ways to expand the transport of international trade by rail, enhance the efficiency of intermodal interchange at ports and other intermodal terminals, and increase the capacity and availability of rail service for seasonal freight needs;
- Consider research on the interconnectedness of commuter rail, passenger rail, freight rail, and other rail networks; and
- Consider regional concerns about rail passenger and freight transportation, including research needs common to designated high-speed corridors, long-distance rail services, and regional intercity rail corridors, projects, and entities.

The NCRRP Oversight Committee, appointed by the Secretary of Transportation in early 2012,

[9] www.trb.org/NCRRP/NCRRP.aspx.

At the first meeting of the NCRRP Oversight Committee, research projects chosen for FY 2013 included workforce capacity in the rail industry, legal aspects of rail programs, and comparing passenger train energy consumption with that of other modes.

met for the first time in May to select initial research topics; a few projects are under way, but most will start up in early 2013. Projects selected include the following:

- Comparison of Passenger Train Energy Consumption with Competing Modes;
- Handbook of Tools and Procedures for Planning and Developing Intercity Passenger Rail Service;
- Passenger Rail in the Context of a Competitive Economic Market;
- Building and Retaining Workforce Capacity for the Rail Industry;
- Innovative Financing Approaches for Passenger and Freight Rail Projects;
- Passenger Rail Project Delivery and Operations Through Multistate Organizations; and
- Legal Aspects of Rail Programs.

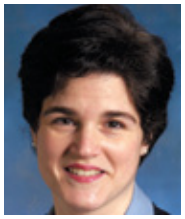
Staff News

ANTHONY P. AVERY and **TERRI M. BAKER** started as Senior Program Assistants in February and April, respectively.

Program Associate **JOSEPH BROWN-SNELL** received a National Academies Distinguished Service Award in November.

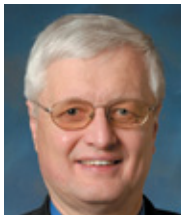
Second Strategic Highway Research Program | SHRP 2

Kirk T. Steudle
Chair
SHRP 2 Oversight Committee



Ann M. Brach
Director
SHRP 2

Stephen J. Andrle
Deputy Director
SHRP 2



Neil J. Pedersen
Deputy Director, Implementation and Communications
SHRP 2

Delivering transportation services in the 21st century has evolved beyond supporting a region's mobility and economic health to include enhancing the quality of life for communities and their environments. The need for new strategies to meet these expanded expectations led to the creation of the Second Strategic Highway Research Program (SHRP 2). Authorized by Congress in August 2005, SHRP 2 is a short-term program to improve safety, reduce costly congestion, and renew deteriorating roads and bridges rapidly. The research under way is advancing technologies and developing systematic approaches to transform innovations into effective and widely used tools for planning, designing, constructing, and operating highways to meet new standards.

TRB administers the program of applied research through a memorandum of understanding with the Federal Highway Administration (FHWA) and the American Association of State Highway and Transportation Officials (AASHTO). These partners will implement the products of SHRP 2, which is scheduled to end in March 2015. Although research is still in progress for 70 of the 116 contracts, much of the activity during 2012 has focused on the transfer of knowledge and products to the implementation partners in preparation for deployment.

The SHRP 2 Implementation Task Force at a Washington, D.C., meeting. In 2012, the transfer of knowledge and products to implementation partners was a key objective of SHRP 2 activities.

A three-year plan sets forth the nationwide deployment of 29 of the early SHRP 2 products. Among the first releases are tools for the rapid renewal of pavements and bridges and for managing the risk and complexities of rapid renewal projects; resources for making organizational changes that improve highway operations and reduce congestion; interagency training for traffic incident management; and a guide for integrating ecosystem planning with highway planning.

These products and many others have been pilot-tested in cooperation with state transportation agencies, metropolitan planning organizations, natural resource agencies, and other stakeholders. To date, 75 pilot tests and field

David Shinar, Ben Gurion University of the Negev, delivered the keynote presentation at the SHRP 2 Safety Research Symposium in July. Transportation professionals shared progress on safety projects and exchanged ideas for data analysis and further research.

tests have been carried out in 28 states. Each of the following summaries of the four focus areas of SHRP 2 highlights a pilot test.

SAFETY

SHRP 2 is addressing its mission to improve safety by conducting the largest-ever naturalistic driving study, focusing on the role of driver performance and behavior in traffic safety. Driving behavior is a critical factor in nearly all traffic crashes. The study will provide detailed, accurate, and objective information on driving behavior and information for developing risk estimates. The information will support new and improved safety countermeasures to prevent traffic collisions and injuries.

The study is fully under way with almost 2,500 drivers participating at six sites across the United States: Bloomington, Indiana; central Pennsylvania; Tampa Bay, Florida; Buffalo, New York; Durham, North Carolina; and Seattle, Washington. Roadway information is also being gathered at each study site to relate driver actions to roadway characteristics.

Analyses of the vast amounts of data collected in the study will support a comprehensive assessment of the ways that driver behavior and performance interact with roadway, environmental, vehicular, and human factors and the ways that these factors influence collision risk, especially in lane departure and intersection collisions. Four projects are pilot-testing the data with analyses of high-priority safety questions related to intersection, run-off-road, and rear-end crashes and to driver distraction. Six research reports have been published and two more are in production.[1]

The implementation priority for the SHRP 2 safety program is to make the driving and roadway data accessible and useful to a range of researchers. A project was initiated this year to disseminate the data and provide user support through the SHRP 2 Data Access Forum on the web.[2]

Installation of a prototype of the forward radar assembly, which gathers data from the vehicles of the participants in the Naturalistic Driving Study (NDS). (Photo: SHRP 2)

[1] SHRP 2 reports are available in PDF at www.trb.org/Publications/PubsSHRP2ResearchReports.aspx, and those available in print can be ordered from the TRB Bookstore online, www.trb.org/Finance/Bookstore.aspx.

[2] http://forums.shrp2nds.us/.

Shane McLaughlin, Virginia Tech Transportation Institute, illustrated methods of NDS data analysis at an Annual Meeting session, Working in the Data Mines. (Photo: Risdon Photography)

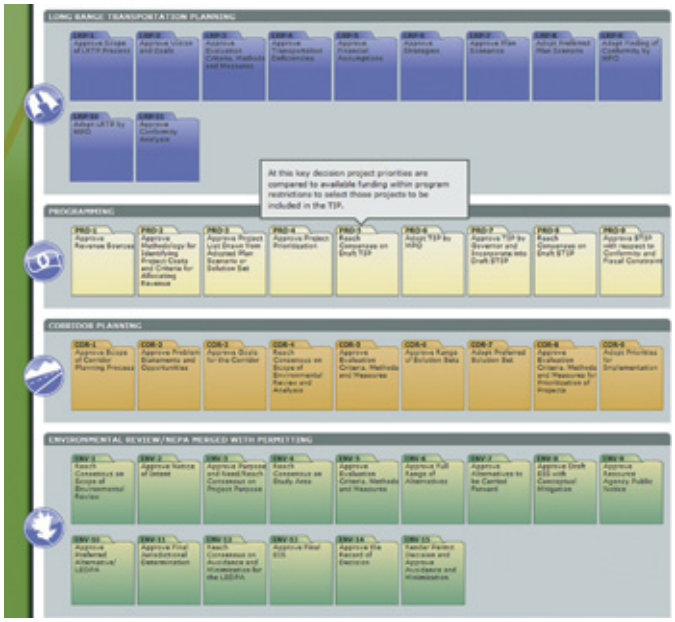
Preparing for the long-term stewardship of the driving study data after SHRP 2 ends is a second implementation priority. FHWA is conducting initial activities through a contract with the Volpe National Transportation Systems Center.

RENEWAL

The renewal focus area is developing advanced methods for transportation agencies to renew aging infrastructure more rapidly, with less disruption to traffic, and with lasting results. The 32 projects in this area can be broadly categorized under the themes of pavements, bridges, nondestructive testing, underground utilities, and project delivery. Research is complete for 19 projects, but 10 are undergoing additional work for validation and pilot testing. Eight reports have been published, and 10 more are in production.

Iowa and Vermont have successfully pilot-tested an accelerated bridge construction toolkit that integrates standard concepts for accelerated construction of all bridge components into designs that local contractors can build with typical equipment. In Iowa, local contractors replaced a three-span bridge in two weeks. The toolkit is enabling Vermont to design replacements for several bridges damaged in the 2011 hurricane. The pilot tests are helping to refine elements of the toolkit before its national implementation.

The video, *One Design—10,000 Bridges*, documents the success of the SHRP 2 accelerated bridge construction toolkit in Iowa and Vermont pilot tests.



Capacity research products—tools for incorporating environmental, economic, and community goals into highway capacity analysis, planning, and design—are integrated into the decision guide TCAPP.

CAPACITY

Capacity research is producing tools for systematically integrating environmental, economic, and community goals into the analysis, planning, and design of new highway capacity. TCAPP, a web tool at transportationforcommunities.com, will integrate most of the products. The decision-support tool builds on the experiences of transportation partners and stakeholders. Practitioners, resource specialists, and stakeholders can use TCAPP to improve the development, priority setting, and communication for transportation plans and projects. Of the 46 projects undertaken, 21 are completed, including 8 pilot tests. Three reports and 23 case studies have been published, and 9 more reports are in production.

Pilot tests of the beta version of the decision guide and of the ecological approach to environmental planning—four pilots for each topic—were completed this year. In each test, public agencies partnered with stakeholders to use the TCAPP products in transportation projects. Participants evaluated the tools and found substantial benefits, especially in developing stakeholder involvement and commitment, resulting

Jaime Viramontes, Oregon DOT, shares information about the Pioneer Mountain–Eddyville highway alignment project with members of the news media. The project was chosen as a pilot test for the cumulative effects assessment and alternatives process, which is available with related tools, methods, and case studies on the TCAPP website. (Photo: Oregon DOT)

in project decisions that were better understood, more widely supported, and more likely to include innovative solutions. Improvements recommended in the assessments are being incorporated into the revised version of TCAPP.

RELIABILITY

To achieve reliable travel times, highway system operations must reduce delays caused by such events as weather and crashes. The reliability focus area is developing foundational analytical, institutional, and design tools for transportation agencies to improve mobility. Of 25 projects undertaken, 10 are complete; seven reports have been published and five are in production.

One project developed a curriculum and training materials for the variety of public agencies and private service providers that respond to traffic incidents. Four workshops in the past year pilot-tested the integrated approach, which allows responders to learn how to coordinate their roles. Of the hundreds participating in workshops, more than 95 percent said they would recommend the course to others. FHWA is planning a nationwide rollout of the training curriculum.

Developed by SHRP 2 reliability research, an integrated curriculum and training materials for first responders will be released nationwide by FHWA. (Photo: National Highway Traffic Safety Administration)

Staff News

STEPHEN J. ANDRLE was promoted to Deputy Director of SHRP 2. Along with new management responsibilities, he continues to head the capacity research area. In November, Andrle received a Distinguished Service Award from the National Academies.

NEIL J. PEDERSEN joined the SHRP 2 staff as Deputy Director responsible for implementation and communications.

Other new additions to the staff include **ALYSSA M. HERNANDEZ**, Reports Coordinator; **MICHAEL J. MARRAZZI**, Editorial Assistant; **REENA MATHEWS**, Senior Program Officer; and **MATTHEW A. MILLER**, Program Officer.

The SHRP 2 Naturalistic Driving Study Team received a Group Distinguished Service Award from the National Academies in November: **DAVID BOWMAN**, **KENNETH L. CAMPBELL**, **WALTER J. DIEWALD**, **CHARLES R. FAY**, **CAROL A. FORD**, National Research Council (NRC) Deputy General Counsel **MARC S. GOLD**, NRC Associate Executive Officer **RONALD D. TAYLOR**, National Academy of Sciences Contract Manager **JOYCE A. TILLMAN**, and consultants **JAMES HEDLUND** and **ANDREW HOROSKO**.

Administration and Finance

The TRB Administration and Finance Division provides financial management services 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 expenditures are estimated at $106 million for the calendar year 2012 (see graph, page 50). A statement of income and expenditures appears on pages 48–49.

At a meeting of the Executive Committee in January, immediate past Finance and Business Operations Director Michael LaPlante reviewed TRB finances. (Photo: Risdon Photography)

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.

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 TRR Online, the web posting of papers from TRB's journal; use of the TRB library; and assistance with the use of 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 for individual affiliates, organizational affiliates receive most publications at no cost, complimentary registrations for the TRB Annual Meeting, and marketing and exhibit opportunities at the Annual Meeting. Organizational affiliate contributions range from $5,000 to $12,000, depending on the level of benefits selected.

Sustaining affiliates are agencies and organizations—including individual corporations and businesses—that support TRB at a level consid-

(continued on page 50)

Michael P. LaPlante
Immediate Past Director
Finance and Business Operations

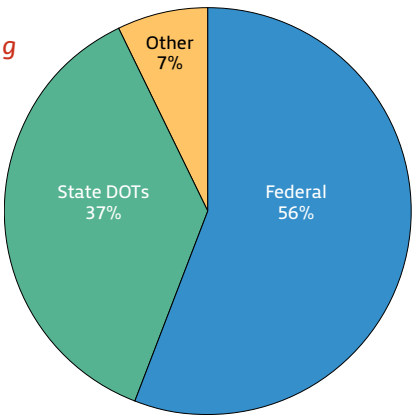
Gary J. Walker
Director
Finance and Business Operations

STATEMENT OF ACTIVITIES

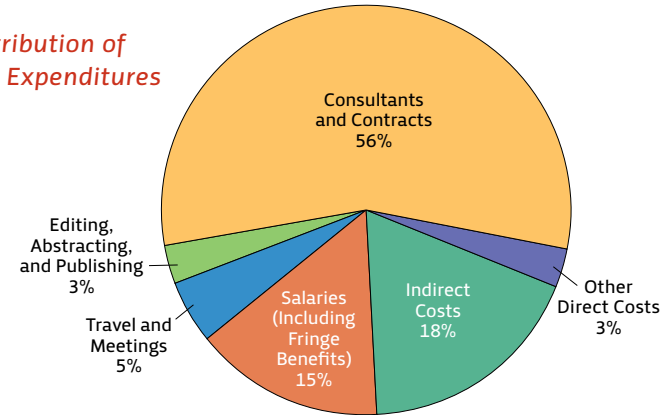
Funding Support by Program and Expenditures
Calendar Years 2011 and 2012

	2011 (ACTUAL)	2012 (PROJECTED)*
Core Technical Activities		
State Highway and Transportation Departments (State DOTs)	$7,340,000	$7,340,000
Federal Government		
Federal Highway Administration (FHWA)	2,300,000	2,300,000
Research and Innovative Technology Administration (RITA)	300,000	300,000
Federal Transit Administration (FTA)	250,000	250,000
National Highway Traffic Safety Administration	200,000	200,000
Bureau of Indian Affairs, Department of the Interior	80,000	80,000
Federal Motor Carrier Safety Administration (FMCSA)	75,000	75,000
Federal Aviation Administration (FAA)	65,000	65,000
Federal Railroad Administration (FRA)	65,000	65,000
Science and Technology Directorate, Department of Homeland Security	65,000	65,000
U.S. Army Corps of Engineers	65,000	65,000
Subtotal, Federal Government	$3,465,000	$3,465,000
Other		
American Public Transportation Association	65,000	65,000
American Transportation Research Institute	65,000	65,000
Association of American Railroads	65,000	65,000
South Coast Air Quality Management District, California	65,000	65,000
Fees and Sales	5,335,000	5,350,000
Subtotal, Other	$5,595,000	$5,610,000
Total, Core Technical Activities	**$16,400,000**	**$16,415,000**
Marine Board Core Program		
U.S. Coast Guard	100,000	96,000
Office of Naval Research	40,000	65,000
National Oceanic and Atmospheric Administration	65,000	40,000
U.S. Army Corps of Engineers	30,000	25,000
U.S. Navy	25,000	25,000
Maritime Administration	10,000	10,000
Bureau of Ocean Energy Management, Regulation, and Enforcement	30,000	0
Total, Marine Board Core Program	**$300,000**	**$261,000**
Cooperative Research Programs (CRP)		
National Cooperative Highway Research Program (State DOTs)	34,330,000	30,094,000
Airport Cooperative Research Program (FAA)	13,086,000	10,261,000
Transit Cooperative Research Program (FTA)	7,072,000	6,180,000
National Cooperative Freight Research Program (RITA)	3,716,000	1,429,000
Hazardous Materials Cooperative Research Program (Pipeline and Hazardous Materials Safety Administration)	1,393,000	641,000
Total, Cooperative Research Programs	**$59,597,000**	**$48,605,000**

TRB Funding Support



Distribution of TRB Expenditures



	2011 (ACTUAL)	2012 (PROJECTED)*
Strategic Highway Research Program 2	$40,814,000	$30,892,000
Continuing Programs		
Innovations Deserving Exploratory Analysis (IDEA)		
NCHRP IDEA (State DOTs)	1,045,000	891,000
Transit IDEA (FTA)	363,000	481,000
Safety IDEA (FRA and FMCSA)	424,000	413,000
Rail IDEA (FRA)	19,000	15,000
Subtotal, IDEA Programs	$1,851,000	$1,800,000
Synthesis Programs		
NCHRP Synthesis (State DOTs)	1,411,000	1,486,000
ACRP Synthesis (FAA)	833,000	837,000
TCRP Synthesis (FTA)	808,000	693,000
Commercial Truck and Bus Safety Synthesis (FMCSA)	372,000	126,000
Subtotal, Synthesis Programs	$3,424,000	$3,142,000
Legal Programs		
NCHRP Legal (State DOTs)	212,000	215,000
TCRP Legal (FTA)	195,000	202,000
ACRP Legal (FAA)	304,000	146,000
Subtotal, Legal Programs	$711,000	$563,000
Total, Continuing Programs	**$5,986,000**	**$5,505,000**
Policy Studies	**$3,657,000**	**$3,521,000**
Conferences and Workshops	**$2,777,000**	**$2,303,000**
TRB TOTAL	**$129,531,000**	**$107,502,000**
Sources of Funds		
Federal	77,295,000	59,834,000
State DOTs	44,338,000	40,026,000
Other	7,898,000	7,642,000
	$129,531,000	**$107,502,000**
Expenditures by Major Cost Category		
Salaries (including fringe benefits)	15,716,000	16,131,000
Travel and Meetings	6,382,000	5,748,000
Editing, Abstracting, and Publishing	3,287,000	2,711,000
Consultants and Contracts	78,887,000	58,677,000
Other Direct Costs	2,656,000	2,781,000
Indirect Costs	20,629,000	19,486,000
Total Expenditures	**$127,557,000**	**$105,534,000**

TRB Reserve Fund

Fund balance, end of previous fiscal year	$13,225,094	$15,199,094
Plus (minus) current fiscal year income over (under) expenditures	1,974,000	1,968,000
Balance, current fiscal year	$15,199,094	$17,167,094

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 2012 data use actual data through September and estimates for the rest of the year.

TRB publications are showcased at the Annual Meeting and at meetings throughout the year. (Photo: Risdon Photography)

(continued from page 47)

erably 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 participate as TRB sponsors. Fees and services are negotiated to fit each sponsor's needs and to assure 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 57–58 for a list of TRB sponsors and sustaining affiliates.)

PUBLICATION SALES AND DISTRIBUTION

TRB's timely distribution of publications disseminates the results of transportation research and technology worldwide. TRB releases many publications—some exclusively—in electronic format. A list of TRB publications issued from January 1 through December 31, 2012, appears on pages 53–56.

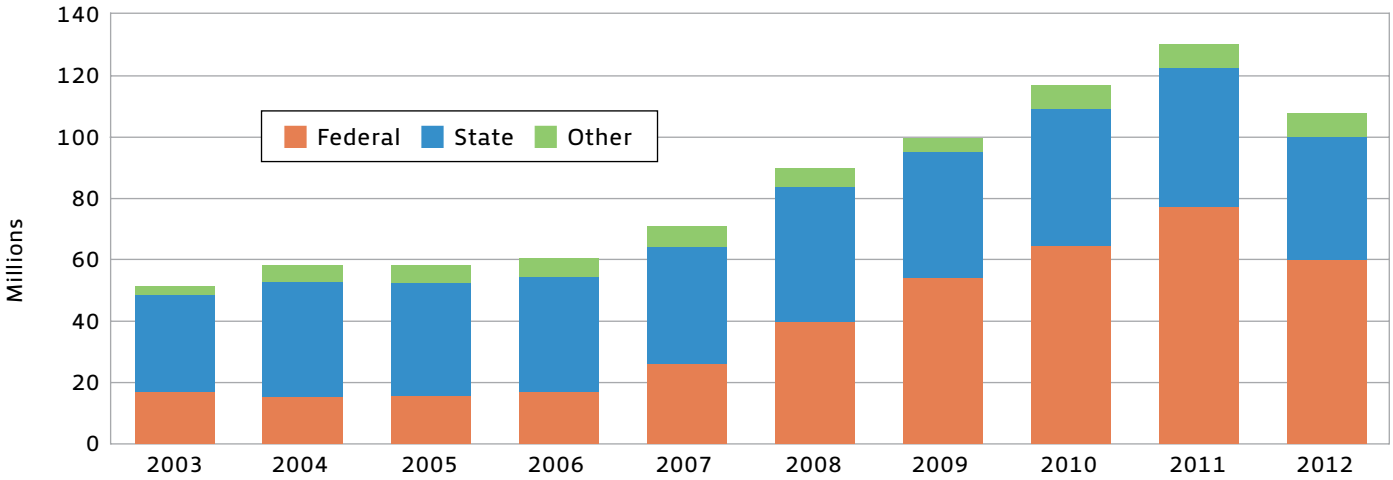
Staff News

GARY J. WALKER succeeded Michael LaPlante as Director of Finance and Business Operations in November. Walker previously was Deputy Director, Office of Finance and Administration, for the Institute of Medicine. LaPlante has moved to the National Research Council's Office of the Chief Financial Officer as Director, Business Process Improvement.

KENNY YANG came on board as an Office Assistant in February.

ROSALIND J. GOMES joined the staff as Accounting and Financial Assistant in June.

TRB Activity Level by Year



TRB Conferences and Workshops *(January 1, 2012–December 31, 2012)*

JANUARY

21	Data Analysis Working Group Forum on Pavement Performance Data Analysis
22–26	TRB 91st Annual Meeting

FEBRUARY

7–9	2nd Biennial National Evacuation Conference
29	Emergency Medical Services Systems, Safety Strategies, and Solutions Summit

APRIL

16–18	9th National Conference on Asset Management
17–19	Joint Rail Conference: Technology to Advance the Future of Rail Transport*
24–26	Council of University Transportation Centers Workforce Summit*
29–May 1	Symposium on Mileage-Based User Fees and Transportation Finance Summit*
30–May 2	Innovations in Travel Demand Forecasting
30–May 3	International Conference on Winter Maintenance and Surface Transportation Weather

MAY

7	Relationship Between the Design and Construction of Rockfall Mitigation Techniques
20–23	8th National Aviation System Planning Symposium
20–25	14th International Conference on Alkali–Aggregate Reactions
22–24	14th International Managed Lanes Conference
23–25	International Society for Asphalt Pavements Symposium on Heavy-Duty Pavements and Bridge Deck Pavements*
23–25	Making Progress: Transportation Planners and Programmers Turn Ideas into Reality

JUNE

2–8	11th International and 2nd North American Symposium on Landslides*
4–7	North American Travel Monitoring Exposition and Conference (NATMEC): Improving Traffic Data Collection, Analysis, and Use
12–13	29th International Bridge Conference*
18–20	North American Transportation Statistics Interchange
19–22	Innovations in Traffic Flow Theory, Highway Capacity, and Quality of Service Symposium
20–22	7th RILEM International Conference on Cracking in Pavements
24–27	4th Urban Street Symposium*
24–27	Transportation-Related Environmental Analysis, Ecology, and Air Quality Summer Conference
26–28	Diagnosing the Marine Transportation System: Measuring Performance and Targeting Improvement*

JULY

8–11	TRB Planning Committees Summer Meeting
8–11	Waste Management and Resource Efficiency in Transportation Summer Workshop
8–12	6th International Conference on Bridge Maintenance, Safety, and Management*
8–12	10th International Conference on Concrete Pavements*
11	Measuring the Transportation System from a Supply Chain Perspective
12	7th SHRP 2 Safety Research Symposium
12–13	Better Safety Results Through Information Sharing Workshop
14–19	13th AASHTO–TRB Maintenance Management Conference*
15–18	51st Annual Workshop on Transportation Law
15–19	Statewide Conference on Heritage
17–19	10th National Conference on Asset Management*
17	Economic Census: Uses for the Transportation Community Workshop
25–27	Workshop on the Future of Road Vehicle Automation
29–Aug 2	TRB–AASHTO Joint Roadside Safety Meeting

AUGUST

3–6	Chinese Overseas Transportation Association International Conference of Transportation Professionals*
20–22	5th National Bus Rapid Transit Conference
20–24	Transportation Hazards and Security Summit and Peer Exchange
28–30	Annual Harbor Safety Committee and Area Maritime Security Committee Conference*
28–30	7th International Conference on Maintenance and Rehabilitation of Pavements and Technological Control*
28–30	Data Analysis Working Group Forum on Pavement Performance Data Analysis

SEPTEMBER

10–12	2nd International Conference on Transportation Geotechnics*
12–13	International Transportation Research Information Access Workshop
12–14	13th National Conference on Transportation Planning for Small and Medium-Sized Communities
17–21	13th International Conference on Mobility and Transport for Elderly and Disabled People (TRANSED)*
18–21	International Conference on Long-Life Concrete Pavements*
18–21	7th Symposium on Pavement Surface Characteristics*
19–21	4th International Conference on Accelerated Pavement Testing*

OCTOBER

8–10	European Transport Conference*
14–17	National Conference for Rural Public and Intercity Bus Transportation: Connecting Communities—Sharing Solutions*
15–16	Marine Board Workshop: Safe Navigation in the U.S. Arctic
26–28	International Symposium on Geotechnical Engineering for High-Speed Transportation Infrastructure*

NOVEMBER

8–9	Household Travel Survey Symposium*
8–9	University Transportation Centers Spotlight Conference on Sustainable Energy and Transportation: Strategies, Research, Data
11–13	12th National Light Rail Conference: Sustaining the Metropolis—Light Rail Transit and Streetcars for Super Cities

DECEMBER

12–16	1st International Conference on Connected Vehicles and Expo*

*TRB was cosponsor of the meeting.

TRB Webinars 2012

JANUARY

12 Optimization of Tack Coat for Hot-Mix Asphalt Placement

APRIL

4 Erosion and Sediment Control for Native and Aggregate Surfaced Roads

10 Managing Gravel Road Maintenance

MAY

2 Practices and Examples to Manage Sign Retroreflectivity in Compliance with the *Manual on Uniform Traffic Control Devices*

10 Cleared for Takeoff: Airport Inspection and Ramp Safety Practices

16 Transportation Asset Management Series, Part 1: Highlights from Transit State of Good Repair Track

30 Transportation Asset Management Series, Part 2: Federal Transit Administration and Transit Cooperative Research Program—Research Results and Initiatives

JUNE

5 Aviation Fuel Costs and Alternatives

12 Guidebook for Sustainability Performance Measurement for Transportation Agencies

19 Recent Roadway Geometric Design Research for Improved Safety and Operations

20 Transportation Asset Management: Highlights from the Focus on Implementation Track

JULY

11 Guidelines on the Use of Auxiliary Through Lanes at Signalized Intersections

18 Transportation Asset Management: Highlights from Beyond Pavement and Bridges Track

25 Sensitivity Evaluation of the *Mechanistic–Empirical Pavement Design Guide* (MEPDG) for Flexible Pavements

AUGUST

1 Developments in Nontraditional Stabilizers

2 Overview and Current Practice of Ground Tire Rubber Use in Asphalt

8 New Dedicated Revenue Mechanisms for Freight Transportation Investment

21 Entering Records into the Research in Progress Database

29 Transportation Risk Management: International Practices for Program Development and Project Delivery

30 Calibration and Precision of Alternate Rutting Models for the MEPDG

SEPTEMBER

7 Overview of Nanotechnology and Use of Nanomaterials as Modifiers for Asphalt Binders

13 Introduction and Demonstration of the New Research Performance Measures Website

Customer Service and Marketing Associate Reginald Gillum guides a webinar.

19 Transportation Asset Management: Current Trends in Pavement and Bridges

25 *Highway Capacity Manual 2010* (HCM 2010) Series: New Signalized Intersection Methodology Applications, Auto Mode

27 HCM 2010 Series: What's New with Unsignalized Intersection Methodologies?

OCTOBER

10 Greenhouse Gas Reduction and Sustainable Construction Strategies for Airports

11 Current Transportation Issues in Indian Country

16 Performance Measures for Public Involvement

18 Basics of Asphalt Modeling, Part 1

23 Performance-Based Sealant Grading Specifications for Hot-Poured Crack Sealants

30 HCM 2010 Series: Freeway Facility Method Applications

31 Quieter Pavements: Measurements and Applications

NOVEMBER

1 HCM 2010 Series: Application of the Unsignalized Pedestrian Crossing and Off-Street Pedestrian and Bicycle Facilities Methods

5 Asset Management for a Sustainable and Responsible Infrastructure Investment: A Long-Term Commitment

13 Portland Limestone Cement: A Technology to Improve the Sustainability of Concrete Pavements

14 Airport Governance and Ownership

DECEMBER

6 Airport Terminal Planning and Design: Focus on Wayfinding and Roadways

11 Basics of Asphalt Modeling, Part 2

18 Model for Identifying and Evaluating the Historic Significance of Post–World War II Housing

20 Geotech Tools: Engineering Tools and Technology Selection Guidance for Geotechnical, Structural, and Pavement Engineers

TRB Publications

Transportation Research Records

2266 Public-Sector Aviation: Graduate Research Award Papers, 2010–2011
2267 Geomaterials 2012
2268 Construction 2012
2269 Freight Systems 2012: Modeling and Logistics
2270 Environment 2012
2271 Sustainable Practices, Performance Measures, and Management
2272 Maintenance Services and Surface Weather 2012
2273 Marine Transportation, Marine Environment, and Port Terminal Operations 2012
2274 Transit 2012, Volume 1, Including 2012 Thomas B. Deen Distinguished Lecture
2275 Transit 2012, Volume 2
2276 Transit 2012, Volume 3
2277 Transit 2012, Volume 4
2278 Freeway Operations; Regional Systems Management and Operations; Managed Lanes 2012
2279 Statistical Methods and Highway Safety Performance 2012
2280 Highway Safety Data, Analysis, and Evaluation 2012
2281 Highway Safety 2012: Traffic Law Enforcement, Alcohol, Occupant Protection, Motorcycles, and Trucks
2282 Geology and Properties of Earth Materials 2012
2283 Network Modeling 2012, Volume 1
2284 Network Modeling 2012, Volume 2
2285 Travel Survey Methods, Freight Data Systems, and Asset Management 2012
2286 Highway Capacity and Quality of Service 2012
2287 Energy and Global Climate Change 2012
2288 Freight Systems 2012
2289 Railways 2012
2290 Concrete Materials 2012
2291 Information Systems, Geographic Information Systems, and Advanced Computing 2012
2292 Maintenance and Preservation 2012
2293 Asphalt Materials and Mixtures 2012, Volume 1
2294 Asphalt Materials and Mixtures 2012, Volume 2
2295 Asphalt Materials and Mixtures 2012, Volume 3
2296 Asphalt Materials and Mixtures 2012, Volume 4
2297 Finance, Pricing, Economics, and Equity Issues
2298 Traffic Control Devices, Visibility, and Highway–Rail Grade Crossings 2012
2299 Pedestrians 2012
2300 Aviation 2012
2301 Operational Effects of Geometrics and Access Management 2012
2302 Travel Demand Forecasting 2012, Volume 1
2303 Travel Demand Forecasting 2012, Volume 2
2304 Pavement Management 2012, Volume 1
2305 Pavement Management 2012, Volume 2
2306 Pavement Management 2012, Volume 3
2307 Planning 2012
2308 Urban and Traffic Data Systems 2012
2309 Highway Design 2012
2310 Soil Mechanics 2012
2311 Traffic Signal Systems 2012
2312 Roundabouts and Emergency Evacuation 2012
2313 Structures 2012
2314 Bicycles 2012
2315 Traffic Flow Theory and Characteristics 2012, Volume 1
2316 Traffic Flow Theory and Characteristics 2012, Volume 2: Driver Behavior; Pedestrian and Simulation Modeling
2317 Developing Countries 2012
2318 Safety Management, Emergency Management Systems, Operator Education, School Transportation, and Older Drivers 2012
2319 Transportation Demand Management and Carsharing 2012
2320 Environmental Justice, Social Factors, and Gender-Related Issues in Transportation
2321 Human Performance, User Information, and Simulation 2012
2322 Travel Behavior 2012, Volume 1
2323 Travel Behavior 2012, Volume 2
2324 Intelligent Transportation Systems and Vehicle–Highway Automation 2012

Special Reports[1]

309 Evaluating the Effectiveness of Offshore Safety and Environmental Management Systems

Conference Proceedings[1]

48 Financing Surface Transportation in the United States: Forging a Sustainable Future—Now!

Conference Proceedings on the Web

5 Research on the Health and Wellness of Commercial Truck and Bus Drivers: Summary of an International Conference
6 Transportation Systems for Livable Communities
7 Research on Fatigue in Transit Operations
8 Improving Roadway Safety Programs Through University–Agency Partnerships

Letter Reports (online)

Long-Term Pavement Performance Committee Letter Report, March 5, 2012
Research and Technology Coordinating Committee Letter Report, March 5, 2012
Long-Term Bridge Performance Committee Letter Report, March 16, 2012
Committee for Review of the Federal Railroad Administration Research, Development, and Demonstration Programs Letter Report, May 31, 2012
Long-Term Bridge Performance Committee Letter Report, August 3, 2012
Long-Term Pavement Performance Committee Letter Report, August 3, 2012

Miscellaneous Report

Rockfall: Characterization and Control

Transportation Research E-Circulars (online)

160 Polyphosphoric Acid Modification of Asphalt Binders: A Workshop
161 Applications of Advanced Models to Understand Behavior and Performance of Asphalt Mixtures
162 Winter Maintenance and Surface Transportation Weather
163 Maintenance Management 2012
164 Climate Change and Transportation: Summary of Key Information
165 Alternative Binders for Sustainable Asphalt Pavement
166 Glossary of Regional Transportation Systems Management and Operations Terms, Second Edition
167 The Promise of Rural Roads
168 Artificial Intelligence Applications to Critical Transportation Issues
169 Measuring the Transportation System from a Supply Chain Perspective
170 Nanotechnology in Concrete Materials

TR News

Nos. 278–283

Online Newsletters

Intercity Rail Passenger Systems, Nos. 19 and 20
TRB Transportation Research E-Newsletter

Airport Cooperative Research Program (ACRP) Reports[2]

37A Guidebook for Measuring Performance of Automated People Mover Systems at Airports

59 Information Technology Systems at Airports—A Primer
60 Guidelines for Integrating Alternative Jet Fuel into the Airport Setting
61 Elimination or Reduction of Baggage Recheck for Arriving International Passengers
62 Airport Apron Management and Control Programs
63 Measurement of Gaseous Hazardous Air Pollutant (HAP) Emissions from Idling Aircraft as a Function of Engine and Ambient Conditions
64 Handbook for Evaluating Emissions and Costs of Auxiliary Power Units (APUs) and Alternative Systems
65 Guidebook for Airport Irregular Operations (IROPS) Contingency Planning
66 Considering and Evaluating Airport Privatization
67 Airport Passenger Conveyance Systems Planning Guidebook
68 Guidebook for Evaluating Terminal Renewal Versus Replacement Options
69 Asset and Infrastructure Management for Airports—Primer and Guidebook
70 Guidebook for Implementing Intelligent Transportation Systems Elements to Improve Airport Traveler Access Information
71 Guidance for Quantifying the Contribution of Airport Emissions to Local Air Quality
72 Guidebook for Selecting Methods to Monitor Airport and Aircraft Deicing Materials
73 Airport-to-Airport Mutual Aid Programs
74 Application of Enterprise Risk Management at Airports
76 Addressing Uncertainty About Future Airport Activity Levels in Airport Decision Making
77 Guidebook for Developing General Aviation Airport Business Plans
78 Airport Ground Support Equipment (GSE): Emission Reduction Strategies, Inventory, and Tutorial
79 Evaluating Airfield Capacity
80 Guidebook for Incorporating Sustainability into Traditional Airport Projects
81 Winter Design Storm Factor Determination for Airports

ACRP Syntheses of Airport Practice[2]

32 Managing Aerial Firefighting Activities on Airports
33 Airport Climate Adaptation and Resilience
34 Subsurface Utility Engineering Information Management for Airports
35 Issues with Use of Airfield LED Light Fixtures
36 Exploring Airport Employee Commute and Parking Strategies
37 Lessons Learned from Airport Safety Management Systems Pilot Studies
38 Expediting Aircraft Recovery at Airports

ACRP Research Results Digests[2]

13 Synthesis of Information Related to Airport Practices
14 Graduate Research Award Program on Public-Sector Aviation Issues
15 Use of Towbarless Tractors at Airports—Best Practices
16 Legal Aspects of Airport Programs—An Update

ACRP Legal Research Digests[2]

13 Index and Digest of Decisions: Compilation of Airport Law Resources (CD-ROM)
14 Achieving Airport-Compatible Land Uses and Minimizing Hazardous Obstructions in Navigable Airspace
15 Compilation of State Airport Authorizing Legislation
16 Procurement of Airport Development and Planning Contracts
17 State and Federal Regulations That May Affect Initiatives to Reduce Airports' Greenhouse Gas (GHG) Emissions

ACRP Web-Only Documents

13 Alternative Fuels as a Means to Reduce PM2.5 Emissions at Airports

Hazardous Materials Cooperative Research Program Reports[2]

7 Role of Human Factors in Preventing Cargo Tank Truck Rollovers
8 Evaluation of the Use of Electronic Shipping Papers for Hazardous Materials Shipments
9 Compendium of Best Practices and Lessons Learned for Improving Local Community Recovery from Disastrous Hazardous Materials Transportation Incidents

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

14 Guidebook for Understanding Urban Goods Movement
15 Dedicated Revenue Mechanisms for Freight Transportation Investment
16 Preserving and Protecting Freight Infrastructure and Routes
17 Multimodal Freight Transportation Within the Great Lakes–Saint Lawrence Basin
18 Marine Highway Transport of Toxic Inhalation Hazard Materials
20 Guidebook for Assessing Evolving International Container Chassis Supply Models
21 Handbook on Applying Environmental Benchmarking in Freight Transportation

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

600 Human Factors Guidelines for Road Systems, Second Edition
693 Attracting, Recruiting, and Retaining Skilled Staff for Transportation System Operations and Management
710 Practical Approaches for Involving Traditionally Underserved Populations in Transportation Decision Making
711 Guidance for the Selection, Use, and Maintenance of Cable Barrier Systems
712 Optimization of Tack Coat for Hot-Mix Asphalt (HMA) Placement
713 Estimating Life Expectancies of Highway Assets
• Vol. 1: Guidebook
• Vol. 2: Final Report
714 Special Mixture Design Considerations and Methods for Warm-Mix Asphalt (WMA), Supplement to NCHRP Report 673: A Manual for Design of Hot-Mix Asphalt, with Commentary
715 Highway Safety Manual Training Materials
716 Travel Demand Forecasting: Parameters and Techniques
717 Scour at Bridge Foundations on Rock
718 Fatigue Loading and Design Methodology for High-Mast Lighting Towers
719 Calibration of Rutting Models for Structural and Mix Design
720 Estimating the Effects of Pavement Condition on Vehicle Operating Costs
721 Fatigue Evaluation of Steel Bridges
722 Assessing Highway Tolling and Pricing Options and Impacts
• Vol. 1: Decision-Making Framework
• Vol. 2: Travel Demand Forecasting Tools
723 Model for Identifying and Evaluating the Historic Significance of Post–World War II Housing
724 Application of LADAR in the Analysis of Aggregate Characteristics
725 Guidelines for Analysis Methods and Construction Engineering of Curved and Skewed Steel Girder Bridges
726 Guidebook for Nighttime Construction: Impacts on Safety, Quality, and Productivity
727 Effective Experiment Design and Data Analysis in Transportation Research
728 Guidelines for Evaluating and Selecting Modifications to Existing Roadway Drainage Infrastructure to Improve Water Quality in Ultra-Urban Areas
729 Automated Enforcement for Speeding and Red Light Running
730 Design Guidance for Freeway Mainline Ramp Terminals
731 Guidelines for Timing Yellow and All-Red Intervals at Signalized Intersections
732 Methodologies to Estimate the Economic Impacts of Disruptions to the Goods Movement System
733 High-Performance–High-Strength Lightweight Concrete for Bridge Girders and Decks
734 Hydraulic Loss Coefficients for Culverts
737 Design Guidance for High-Speed to Low-Speed Transition Zones for Rural Highways
742 Communicating the Value of Preservation

NCHRP Syntheses of Highway Practice[3]

424 Engineering Economic Analysis Practices for Highway Investment
425 Waterproofing Membranes for Concrete Bridge Decks
426 Performance-Based Highway Maintenance and Operations Management
427 Extent of *Highway Capacity Manual* Use in Planning
428 Practices and Procedures for Site-Specific Evaluations of Earthquake Ground Motions
429 Geotechnical Information Practices in Design–Build Projects
430 Cost-Effective and Sustainable Road Slope Stabilization and Erosion Control
431 Practices to Manage Traffic Sign Retroreflectivity
432 Recent Roadway Geometric Design Research for Improved Safety and Operations
433 Significant Findings from Full-Scale Accelerated Pavement Testing
434 Use of the U.S. Census Bureau's Public Use Microdata Sample (PUMS) by State Departments of Transportation and Metropolitan Planning Organizations
436 Local Policies and Practices That Support Safe Pedestrian Environments
437 Assessing the Long-Term Performance of Mechanically Stabilized Earth Walls
438 Expedited Procurement Procedures for Emergency Construction Services

NCHRP Research Results Digests[3]

359 Models to Support State-Owned Park-and-Ride Lots and Intermodal Facilities
365 Sustainable Pavement Maintenance Practices
366 Local and State Partnerships with Taxicab Companies
367 Continuing Project to Synthesize Information on Highway Problems
368 State Department of Transportation (DOT) Financial Auditing Requirements for Public Transportation Assistance Programs
369 AASHTO T209: Effect of Agitation Equipment Type on Theoretical Maximum Specific Gravity Values
370 Guidelines for Project Selection and Materials Sampling, Conditioning, and Testing in WMA Research Studies
373 Toolkit for Reporting Rural and Specialized Transit Data—Making Transit Count
374 Proposed Technology Evaluation Program for Warm-Mix Asphalt
375 Rural Public Transportation Strategies for Responding to the Livable and Sustainable Communities Initiative
376 Data Needs for Assessing Rural Transit Needs, Benefits, and Levels of Service
378 Evaluation of Bridge Scour Research
379 Selected State DOT Cost-Reduction Initiatives for the Administration of State Public Transportation Programs

NCHRP Legal Research Digests[3]

56 The Ramifications of Post-Kelo Legislation on State Transportation Projects
57 Tort Liability Defense Practices for Design Flexibility

NCHRP Publicity Publication

NCHRP at 50 Years

NCHRP Web-Only Documents

182 Appendices to NCHRP Report 693
183 Guide for Managing NEPA-Related and Other Risks in Project Delivery
184 Going the Distance Together: A Citizen's Guide to Context-Sensitive Solutions for Better Transportation
186 The Superpave™ Mix Design System: Anatomy of a Research Program
187 Seismic Design of Geosynthetic-Reinforced Soil Bridge Abutments with Modular Block Facing
188 Survey of State Funding for Public Transportation—Ways to Improve It
189 Design and Management of Historic Roads
190 Structural Design of Culvert Joints
191 Analysis of Managed Lanes on Freeway Facilities

Transit Cooperative Research Program (TCRP) Reports[2]

95 Traveler Response to Transportation System Changes, Chapter 16: Pedestrian and Bicycle Facilities
151 A Guide for Implementing Bus on Shoulder (BOS) Systems
152 Guidelines for Ferry Transportation Services
153 Guidelines for Providing Access to Public Transportation Stations
154 Developing, Enhancing, and Sustaining Tribal Transit Services: A Guidebook
155 Track Design Handbook for Light Rail Transit, Second Edition
156 Guidebook for Evaluating Fuel Purchasing Strategies for Public Transit Agencies
157 State of Good Repair: Prioritizing the Rehabilitation and Replacement of Existing Capital Assets and Evaluating the Implications for Transit
158 Improving ADA Paratransit Demand Estimation: Regional Modeling
159 Transforming Public Transportation Institutional and Business Models

TCRP Syntheses of Transit Practice[2]

95 Practices for Wayside Rail Transit Worker Protection
96 Off-Board Fare Payment Using Proof-of-Payment Verification
97 Improving Bus Transit Safety Through Rewards and Discipline
98 Ridesharing as a Complement to Transit
99 Uses of Social Media in Public Transportation
100 Elevator and Escalator Maintenance and Safety Practices
101 Implementation and Outcomes of Fare-Free Transit Systems

TCRP Research Results Digests[2]

104 Synthesis of Information Related to Transit Problems
105 Summary of Research Findings: Assessing and Comparing Environmental Performance of Major Transit Investments

TCRP Legal Research Digests[2]

39 Competition Requirements of the Design–Build, Construction Manager at Risk, and Public–Private Partnership Contracts—Seven Case Studies
40 Legal Issues Involving Surety for Public Transportation Projects
41 Transit Labor 1(c) Employee Protection Digest (CD-ROM)
42 Transit Agency Intergovernmental Agreements: Common Issues and Solutions

TCRP Web-Only Documents

52 Performance-Based Track Geometry, Phase 1
53 Operation of Light Rail Transit Through Ungated Crossings at Speeds over 35 mph
54 Developing, Enhancing, and Sustaining Tribal Transit Services: Final Research Report
55 Assessing and Comparing Environmental Performance of Major Transit Investments
56 Methodology for Determining the Economic Development Impacts of Transit Projects
57 Audience Measurement for Transit Advertising

Cooperative Research Program CD-ROMs

103 Appendixes to NCFRP Report 16: Preserving and Protecting Freight Infrastructure and Routes
105 Resource CD for NCFRP Report 14: Guidebook for Understanding Urban Goods Movement
106 *Highway Safety Manual* Training Materials, with NCHRP Report 715
107 Planning Tool and Appendices for TCRP Report 153
108 ACRP Legal Research Digest 13: An Index and Digest of Decisions—Compilation of Airport Law Resources
109 Appendices for ACRP Report 66
110 Resource CD for ACRP Report 67

111 Models for Estimating the Effects of Pavement Condition on Vehicle Operating Costs
112 Analysis Templates for ACRP Report 68
113 Tool for Evaluating Emissions and Costs of APUs and Alternative Systems for ACRP Report 64
114 Applying Intelligent Transportation Systems to Improve Airport Traveler Access Information
115 Appendixes to ACRP Report 71
116 Stormwater Best Management Practices Sizing and Design Tool with NCHRP Report 728
117 Airport ERM Tool for ACRP Report 74
119 General Aviation Business Plan Digital Files with ACRP Report 77
120 TCRP Legal Research Digest 41: Transit Labor 13(c) Employee Protection Digest
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[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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