

2003 ANNUAL REPORT

The mission of the Transportation Research Board is to promote innovation and progress in transportation through research. In an objective and interdisciplinary setting, the Board facilitates the sharing of information on transportation practice and policy by researchers and practitioners; stimulates research and offers research management services that promote technical excellence; provides expert advice on transportation policy and programs; and disseminates research results broadly and encourages their implementation.

THE NATIONAL ACADEMIES™

Advisers to the Nation on Science, Engineering, and Medicine

The nation turns to the National Academies—National Academy of Sciences, National Academy of Engineering, Institute of Medicine, and National Research Council—for independent, objective advice on issues that affect people’s lives worldwide. Established in 1916 under the congressional charter of the private, nonprofit National Academy of Sciences, the National Research Council brings the resources of the entire scientific and technical community to bear on national problems through its volunteer advisory committees. The principal operating agency of both the National Academy of Sciences and the National Academy of Engineering, the National Research Council is administered jointly by the two academies and the Institute of Medicine.

The National Research Council has six major program units. One of these is the Transportation Research Board, which was organized in 1920 and is charged with promoting innovation and progress in transportation through research.

DEAR SUPPORTER OF TRB

We are pleased to report that 2003 has been an exciting and productive year. Among many key accomplishments was the completion of the challenging task of reorganizing TRB's standing technical committees.

In January 1922, when 30 transportation professionals gathered at our first Annual Meeting, three technical committees already had been organized. Standing technical committees quickly became the Board's primary operational element—promoting and tracking progress in specific technical areas, soliciting and selecting technical papers for presentation at Annual Meeting sessions, and engaging thousands of transportation professionals who volunteer their time and expertise.

More than 30 committees were established in the first decade, and by 1970 the total had reached 125. The 1974 transition from the Highway Research Board to the Transportation Research Board prompted another growth spurt with new committees to serve aviation, rail, transit, and intermodal transportation.

Today TRB has nearly 200 standing committees and task forces. Although TRB has taken on other responsibilities over the years and makes extensive use of a variety of special-purpose committees and panels, the standing committees continue to be at the heart of the organization.

As the number increased, TRB organized the standing committees into sections and groups, with the Technical Activities Council exercising overall management. The committees were organized into four groups in 1968, and a fifth group was added in 1984. No further changes were made until the past year, when the Technical Activities Council completed an intensive two-year review of its organization under the leadership of Council Chair Anne Canby and Technical Activities Director Mark Norman.

The Council concluded that changes were overdue and reorganized the committees into 11 groups. Six of the groups address functional components of transportation, with a focus on highway transportation. Each of the other groups concentrates primarily on a specific mode—public transportation, rail, marine, aviation, and freight systems.

This new organization will sharpen the focus of the group councils, give more visibility to the non-

highway modes, and position the group councils to undertake technical and policy initiatives that fill gaps or cut across committee scopes. We have the right organization now and for the immediate future, but the review has demonstrated that we must revisit and revise the organizational structure periodically. TRB will rely on the Technical Activities Council and the new group councils to accomplish the service improvements that the reorganization is intended to foster.

Summarized below are other highlights of 2003.

ANNUAL MEETING AND CONFERENCES

The 2003 Annual Meeting attracted more than 9,100 participants, a new record with a slight gain over the 2002 totals. The meeting included more than 500 sessions, 350 committee meetings, and 150 meetings of affiliated organizations. The spotlight themes were security, safety, and transportation funding. Among the meeting highlights were the Chairman's Luncheon, with Admiral James Loy, Administrator of the Transportation Security Administration and at the time Under Secretary of Transportation for Security, explaining the status of federal security programs; a special session featuring presentations by the administrators of component agencies of the U.S. Department of Transportation on issues relating to Congressional legislation to reauthorize the federal transportation programs,



Executive Director Robert E. Skinner, Jr. (*left*); Genevieve Giuliano, 2003 Executive Committee Chair; and Michael S. Townes, 2003 Executive Committee Vice Chair.



Admiral James M. Loy, Administrator of the Transportation Security Administration, delivered the Chairman's Luncheon address at the 2003 TRB Annual Meeting.

moderated by Emil Frankel, Assistant Secretary for Transportation Policy; and the Distinguished Lecture, delivered by former TRB Executive Director Thomas B. Deen, after a ceremony renaming the annual series in his honor.

During the course of the year, TRB organized 70 specialty conferences and workshops. Topics of major conferences ranged from low-volume roads and statewide transportation planning to road pricing, light rail transit (jointly with the American Public Transportation Association), and community impact assessment.

RESEARCH MANAGEMENT

Funding for the National Cooperative Highway Research Program (NCHRP) totaled \$28 million in 2003—a 12 percent drop from the previous year, matching the decline in federal-aid highway funding for state planning and research. Significant NCHRP products included guidance documents, released at the National Highway Safety Leadership Forum, for implementing the Strategic Safety Plan of the American Association of State Highway and Transportation Officials (AASHTO); final drafts of a proposed guide for pavement design, with associated software; and detailed research plans for the proposed Future Strategic Highway Research Program, now under congressional consideration.

Funding for the Transit Cooperative Research Program (TCRP) held steady at the federally authorized level of \$8.25 million. Major TCRP reports issued in 2003 included a new manual on transit capacity and service quality measurement and a handbook on traveler response to transportation systems changes, as well as guidance on planning bus rapid transit services.

The first products of the Commercial Truck and Bus Safety Synthesis Program, sponsored by the Federal Motor Carrier Safety Administration, were completed in 2003, and more are in preparation for release in 2004.

ADVICE TO POLICY MAKERS

TRB celebrated the 20th anniversary of its conduct of policy studies on issues of national importance in transportation with the publication of a special volume, *Informing Transportation Policy Choices*, highlighting reports that have helped to frame the issues, shape the debate, and inform the development of national policy.

Policy study activity remained at a high level in 2003, with specially appointed committees tackling complex and controversial topics. Completed studies addressed such topics as technologies to increase seat belt use, developing the transportation workforce, the federal role in marine transportation, a review of the program to establish standards for intelligent transportation systems, cooperative solutions to airport research needs, and a national freight data program.

Studies were initiated on the long-term viability of fuel taxes for transportation finance; pipelines and public safety; and the relationships among physical activity, public health, transportation, and land use. This last was one of several interdisciplinary studies that TRB has undertaken in collaboration with other units of the National Academies. Continuing advisory committees have provided insights to federal agencies on highway research, high-speed rail research, the long-term pavement performance test, and the federal large truck crash causation study.

TRANSPORTATION SECURITY

A focus for transportation agencies for many years to come, security was a spotlight theme at the 82nd Annual Meeting, and the TRB Executive Committee held a special policy session on the topic in June 2003. NCHRP and TCRP together have allocated more than \$6 million since September 11, 2001, for quick-response research addressing the security needs of highway and transit systems. Approximately 35 research projects have been authorized, and 25 have been completed, with results delivered to the agencies involved.

This year TRB completed a scoping study for the U.S. Department of Transportation on the cybersecurity of freight transportation information systems, and the Marine Board held a special workshop on the ship salvage capabilities necessary for security readiness.

INFORMATION DISSEMINATION

Our website, www.TRB.org, continues to evolve and improve. The redesigned front page facilitates user navigation, highlighting TRB publications, as well as headline links to current news. Our site is part of the National Academies' website, which recently received a top ranking of 10 on a scale of 10 from the Internet search engine firm Google, rating online

significance, respect from others, and predictable value. This year, the TRB website averaged more than 83,000 visitors each month, accounting for approximately 10 percent of the traffic on the Academies' servers and more than 30 percent of the document downloads.

TRB issued more than 200 publications this past year. These included a record number of products from the Cooperative Research Programs—approximately 120 reports in hard copy, CD-ROM, or web-based formats. The number of subscribers to our Transportation Research E-Newsletter increased by almost 60 percent over last year's figure, to a total of 11,000.

NATIONAL ACADEMIES AND NATIONAL RESEARCH COUNCIL UPDATES

The new building that has housed TRB since July 2002 was dedicated as the Keck Center of the National Academies in May 2003, inaugurating a program funded with a \$40 million grant from the W. M. Keck Foundation to realize the untapped potential of interdisciplinary research. Other units of the National Research Council issued significant reports on a range of topics, including smallpox immunization, underage drinking, oil and gas exploration in Alaska, and the radiation exposure of atomic-era veterans.



Bruce Alberts, President, National Academy of Sciences, and Richard N. Foster, Director of the W. M. Keck Foundation Board of Directors, cut the ribbon at ceremonies dedicating the Keck Center of the National Academies, which houses TRB. William A. Wulf, President, National Academy of Engineering, looks on.



Director of Cooperative Research Programs Robert Reilly (*right*) received the AASHTO President's Award for Research from James Codell III, Secretary of the Kentucky Transportation Cabinet, former AASHTO President, and a current TRB Executive Committee member.

SPONSOR AND STAFF NEWS

Citing a financial downturn in the paving industry, the National Asphalt Pavement Association suspended its sponsorship of TRB but expressed the hope of being able to resume sponsorship soon.

David Jones of the South African Council for Scientific and Industrial Research joined the TRB staff on a one-year assignment as visiting researcher. The seventh such visitor to the Special Programs Division, he will be working with the Long-Term Pavement Performance Committee on accelerated pavement testing.

Several TRB staff members received recognition from other organizations:

- Technical Activities Director Mark R. Norman received the Intelligent Transportation Systems Council Achievement Award from the Institute of Transportation Engineers;
- Transportation Safety Coordinator Richard F. Pain was honored with the National Safety Council's Award for Distinguished Service to Safety;
- Director of Cooperative Research Programs Robert Reilly received the AASHTO President's Award for Research; and
- Executive Director Robert E. Skinner, Jr., was the recipient of the James Laurie Prize from the American Society of Civil Engineers.

Genevieve Giuliano

Genevieve Giuliano
Chair, Executive Committee

Robert E. Skinner, Jr.

Robert E. Skinner, Jr.
Executive Director

TRANSPORTATION RESEARCH BOARD

2003 EXECUTIVE COMMITTEE



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E. Dean Carlson



Joanne F. Casey



James C. Codell III



John L. Craig



Bernard S. Groseclose, Jr.



Susan Hanson



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Ronald F. Kirby



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Jeff P. Morales



Kam Movassaghi



Carol A. Murray



David Plavin



John Rebensdorf



Catherine L. Ross

Chair: Genevieve Giuliano, Director, Metrans Transportation Center, and Professor, School of Policy, Planning, and Development, University of Southern California, Los Angeles

Vice Chair: Michael S. Townes, President and CEO, Hampton Roads Transit, Virginia

Executive Director: Robert E. Skinner, Jr., Transportation Research Board

Michael W. Behrens, Executive Director, Texas Department of Transportation, Austin

Joseph H. Boardman, Commissioner, New York State Department of Transportation, Albany

Sarah C. Campbell, President, TransManagement, Inc., Washington, D.C.

E. Dean Carlson, President, Carlson Associates, Topeka, Kansas (Past Chair, 2002)

Joanne F. Casey, President and CEO, Intermodal Association of North America, Greenbelt, Maryland

James C. Codell III, Secretary, Kentucky Transportation Cabinet, Frankfort

John L. Craig, Director, Nebraska Department of Roads, Lincoln

Bernard S. Groseclose, Jr., President and CEO, South Carolina State Ports Authority, Charleston

Susan Hanson, Landry University Professor of Geography, Graduate School of Geography, Clark University, Worcester, Massachusetts

Lester A. Hoel, L.A. Lacy Distinguished Professor of Engineering, Department of Civil Engineering, University of Virginia, Charlottesville (Past Chair, 1986)

Henry L. Hungerbeeler, Director, Missouri Department of Transportation, Jefferson City

Adib K. Kanafani, Cahill Professor and Chairman, Department of Civil and Environmental Engineering, University of California, Berkeley

Ronald F. Kirby, Director, Transportation Planning, Metropolitan Washington Council of Governments, Washington, D.C.

Herbert S. Levinson, Principal, Herbert S. Levinson Transportation Consultant, New Haven, Connecticut

Michael D. Meyer, Professor, School of Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta

Jeff P. Morales, Director of Transportation, California Department of Transportation, Sacramento

Kam Movassaghi, Secretary, Louisiana Department of Transportation and Development, Baton Rouge

Carol A. Murray, Commissioner, New Hampshire Department of Transportation, Concord

David Plavin, President, Airports Council International, Washington, D.C.

John Rebensdorf, Vice President, Network and Service Planning, Union Pacific Railroad Company, Omaha, Nebraska

Catherine L. Ross, Harry West Chair of Quality Growth and Regional Development, College of Architecture, Georgia Institute of Technology, Atlanta



Genevieve Giuliano
Chair



Michael S. Townes
Vice Chair



Robert E. Skinner, Jr.
Executive Director



John M. Samuels



Paul P. Skoutelas



Martin Wachs



Michael W. Wickham



Marion C. Blakey



Samuel G. Bonasso



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George Bugliarello



Thomas H. Collins



Jennifer L. Dorn



Robert B. Flowers



Edward R. Hamberger



John C. Horsley



Robert S. Kirk



Rick Kowalewski



William W. Millar



Mary E. Peters



Suzanne Rudzinski



Jeffrey W. Runge



Allan Rutter



Annette M. Sandberg



William G. Schubert



Robert A. Venezia

John M. Samuels, Senior Vice President, Operations Planning and Support, Norfolk Southern Corporation, Norfolk, Virginia (Past Chair, 2001)

Paul P. Skoutelas, CEO, Port Authority of Allegheny County, Pittsburgh, Pennsylvania

Martin Wachs, Director, Institute of Transportation Studies, University of California, Berkeley (Past Chair, 2000)

Michael W. Wickham, Chairman, Roadway Corporation, Akron, Ohio

Marion C. Blakey, Administrator, Federal Aviation Administration, U.S. Department of Transportation (ex officio)

Samuel G. Bonasso, Acting Administrator, Research and Special Programs Administration, U.S. Department of Transportation (ex officio)

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

George Bugliarello, Foreign Secretary, National Academy of Engineering, Washington, D.C. (ex officio)

Thomas H. Collins (Adm., U.S. Coast Guard), Commandant, U.S. Coast Guard, Washington, D.C. (ex officio)

Jennifer L. Dorn, Administrator, Federal Transit Administration, U.S. Department of Transportation (ex officio)

Robert B. Flowers (Lt. Gen., U.S. Army), Chief of Engineers and Commander, U.S. Army Corps of Engineers, Washington, D.C. (ex officio)

Edward R. Hamberger, President and CEO, Association of American Railroads, Washington, D.C. (ex officio)

John C. Horsley, Executive Director, American Association of State Highway and Transportation Officials, Washington, D.C. (ex officio)

Robert S. Kirk, Director, Office of Advanced Automotive Technologies, U.S. Department of Energy (ex officio)

Rick Kowalewski, Acting Director, Bureau of Transportation Statistics, U.S. Department of Transportation (ex officio)

William W. Millar, President, American Public Transportation Association, Washington, D.C. (ex officio) (Past Chair, 1992)

Mary E. Peters, Administrator, Federal Highway Administration, U.S. Department of Transportation (ex officio)

Suzanne Rudzinski, Director, Transportation and Regional Programs, U.S. Environmental Protection Agency (ex officio)

Jeffrey W. Runge, Administrator, National Highway Traffic Safety Administration, U.S. Department of Transportation (ex officio)

Allan Rutter, Administrator, Federal Railroad Administration, U.S. Department of Transportation (ex officio)

Annette M. Sandberg, Administrator, Federal Motor Carrier Safety Administration, U.S. Department of Transportation (ex officio)

William G. Schubert, Administrator, Maritime Administration, U.S. Department of Transportation (ex officio)

Robert A. Venezia, Program Manager, National Aeronautics and Space Administration, Washington, D.C. (ex officio)

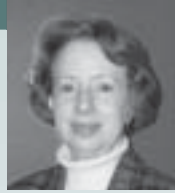
EXECUTIVE OFFICE



Lester A. Hoel
*Chair, Subcommittee
for NRC Oversight*



Robert E. Skinner, Jr.
Executive Director



Suzanne B. Schneider
*Associate Executive
Director*

The TRB Executive Office provides policy and operational guidance for programs and activities; oversees committee and panel appointments and report review; provides personnel support for TRB staff; 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 manages the editing, production, design, and publication of many TRB reports, including its journal series, magazine, and other titles; the Cooperative Research Programs Division manages the publication process for its own reports series.

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, 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. Lester A. Hoel, TRB Division Chair for NRC Oversight, chairs this sub-

committee and represents TRB as an ex officio member on the NRC Governing Board.

The Executive Office processes the Board's large volume of committee and panel appointments and maintains committee membership records. A hallmark of the National Academies is its institutional process to ensure the independent, rigorous review of reports. In maintaining these high standards, TRB carefully matches the review criteria and procedures to the type of report.

PUBLICATIONS

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

TRB books and reports cover 16 broad categories and topics, spanning the range of transportation functions and modes. The TRB Publications Office produces titles in the following series:

- *Transportation Research Record: Journal of the Transportation Research Board* gathers technical papers, originally presented at TRB Annual Meetings and other conferences, that have been accepted for publication through peer review. Each year, the Board publishes approximately 40 volumes of the journal, containing more than 650 papers grouped by subject. Papers presented at the Annual Meeting and approved for publication are issued within 6 to 12 months. A CD-ROM collects the entire year's Records, adding a 5-year index of authors, titles, and subjects.
- The bimonthly magazine *TR News* features time-

ly 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, meeting announcements, and highlights of TRB activities are also included. Selected features of *TR News* are posted on the TRB website, and the full issue is made accessible on the web on a four-month delay.¹

- *Special Reports* contain the results of TRB policy studies on issues of national importance in transportation. These studies, many of which are conducted at the request of federal agencies or of Congress, focus on a variety of complex, often controversial, topics. All current and selected out-of-print special reports are posted on the Board's website.²
- *Conference Proceedings* assemble formal papers, presentations, and summaries of discussions from TRB conferences and workshops.³
- *Transportation Research Circulars*—products of the Board's standing technical committees—collect research problem statements and provide other materials considered useful for a limited time or to a limited audience. Circulars are posted on the TRB website.⁴
- *Miscellaneous Reports* include special publications like the *Highway Capacity Manual 2000* and the *Access Management Manual* released this year.

In addition, the Cooperative Research Programs Division produces an array of titles in several publications series (see pages 48–50).

COMMUNICATIONS

Improving the communication and public awareness of transportation issues and increasing the dissemi-



TR News celebrated its 40th anniversary in 2003.

¹ http://www4.trb.org/trb/onlinepubs.nsf/web/tr_news

² http://www4.trb.org/trb/onlinepubs.nsf/web/trb_special_reports

³ <http://www4.trb.org/trb/onlinepubs.nsf/web/conferences>

⁴ <http://www4.trb.org/trb/onlinepubs.nsf/web/circular?OpenDocument>



Executive Committee members and invited guests during a break at the June meeting in Woods Hole. The Executive Office provides staff support for the work of the Executive Committee.



The TRB Executive Committee Subcommittee for National Research Council Oversight met in June at the National Academies' conference center in Woods Hole, Massachusetts: (clockwise, from left) Associate Executive Director Suzanne Schneider, Executive Committee Vice Chair Michael S. Townes, Executive Committee Chair Genevieve Giuliano, E. Dean Carlson, Subcommittee Chair Lester A. Hoel, and Executive Director Robert E. Skinner, Jr. (Other members are John Craig and Susan Hanson.) The subcommittee works to ensure that TRB committee appointments and reports conform to the high standards of the National Academies.

nation of research findings worldwide are major focuses for TRB. During the past year, TRB developed and implemented a variety of initiatives intended to improve communications and outreach.

One of the Board's most successful communications initiatives is the weekly *Transportation Research E-Newsletter*,⁵ which reports on transportation research and research-related events within TRB and beyond. Circulation of the free newsletter is currently more than 12,000 and growing.

Other communications activities include enhancements to the Board's website; outreach to local government groups, other organizations, and individuals beyond traditional TRB constituencies; and targeting new audiences for specific reports and activities. For example, TRB developed feature articles about the findings and recommendations in Special Report 269, *The Relative Risks of School Travel: A National Perspective and Guidance for Local Community Risk Assessment*, for periodicals issued by the National School Boards Association and the National Parents and Teachers Association.

STAFF NEWS

Andrea Smith joined the Publications Office as Senior Production Assistant, and **Jennifer Weeks** assumed new responsibilities as Senior Editorial Assistant.

⁵ <http://gulliver.trb.org/news/>. To subscribe, send an e-mail to RHouston@nas.edu with "Subscribe TRB E-Newsletter" in the subject field.

TECHNICAL ACTIVITIES

The TRB Technical Activities Division provides a forum for transportation professionals to identify research needs and to share information on research and issues of interest. The division's staff of specialists in each mode and discipline work with a network of volunteers to carry out activities on behalf of TRB sponsors and the transportation community. This network includes members and friends of more than 200 standing committees, supplemented by TRB representatives in each state, in more than 150 universities, and in 35 transit agencies.

During 2003, these activities included

- Revising the organizational structure of TRB standing committees to represent more directly the nonhighway modes, planning and environment, policy and organization, and systems users;
- Conducting the TRB 82nd Annual Meeting in January 2003, attracting a record 9,100 transportation professionals and students from around the world;
- Convening more than 70 specialty conferences, major meetings, and workshops on topics of interest to the transportation community;
- Peer reviewing more than 2,000 papers and publishing 755 papers in 43 volumes of the 2003 series of the *Transportation Research Record: Journal of the Transportation Research Board*, as well as reports from conferences and web circulars (see pages 47–48 for a complete list of titles published in 2003);



Anne P. Canby
Council Chair
Technical Activities



Neil J. Pedersen
Council Chair
Group 1, Transportation
Systems Planning and
Administration



Gale C. Page
Council Chair
Group 2, Design and
Construction of
Transportation Facilities



Jonathan E. Upchurch
Council Chair
Group 3, Operation,
Safety, and Maintenance
of Transportation
Facilities



Breland C. Gowan
Council Chair
Group 4, Legal Resources



Katherine F. Turnbull
Council Chair
Group 5, Intergroup
Resources and Issues



Mark R. Norman
Director
Technical Activities



The U.S. Department of Transportation's Road to Reauthorization, a well-attended spotlight session at the 2003 Annual Meeting, featured presentations by top officials: (from left) Annette Sandberg of the Federal Motor Carrier Safety Administration, Jeffrey W. Runge of the National Highway Traffic Safety Administration, Jennifer L. Dorn of the Federal Transit Administration, Mary E. Peters of the Federal Highway Administration, session moderator Emil Frankel of the U.S. Department of Transportation, Ellen G. Engleman of the Research and Special Programs Administration, William G. Schubert of the Maritime Administration, Marion C. Blakey of the Federal Aviation Administration, and Alan Rutter of the Federal Railroad Administration.

- Visiting every state department of transportation (DOT), as well as selected universities, transit and other modal agencies, and industry organizations, to learn about the issues they are facing and to determine how TRB can help in addressing the issues; and
- Taking steps to increase participation by young people, minorities, and women in TRB committees and activities.

ORGANIZING FOR THE FUTURE

Surveys and discussions over a two-year period—part of the division's Quality Improvement Program—generated input on the current and future organization of the standing committees. A division summit meeting in March 2002 produced the recommendation to

... review and evaluate the existing committee organizational structure and, if needed, reorganize groups and sections based on the inherent matrix structure of transportation.

The TRB Technical Activities Council (formerly the Division A Council) and staff evaluated several options within the context of the mission and the core goals and guiding principles established by the Quality Improvement Program. The revised organizational committee structure, which takes effect January 2004, is shown in Table 1.

The approximately 200 standing committees are being organized into 11 groups. Six of the groups—comprising approximately 150 committees—address the functional components of transportation, with a focus on highways. Each of the remaining five groups concentrates primarily on a specific mode: public transportation, rail, marine, aviation, and freight systems. This functional and modal structure should stimulate synergy among the groups, allowing the standing committees to address a variety of specific and crosscutting transportation research issues.

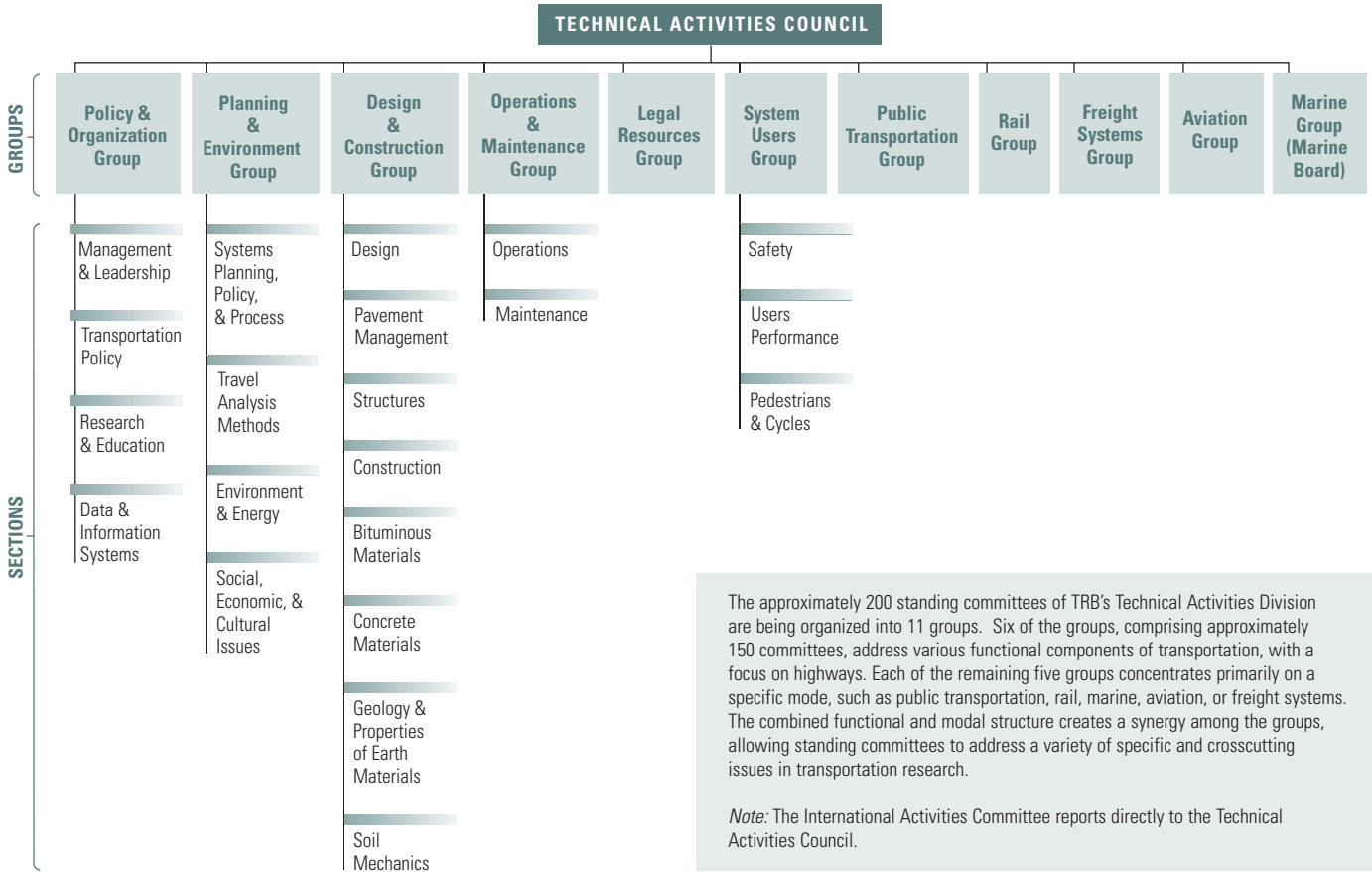
To supplement the reorganization, the expanded Technical Activities Council, under the leadership of Chair Anne P. Canby, initiated the following action items during 2003:

- Defined the roles of the Technical Activities Council, groups, and sections;
- Enhanced the communications tools and links among groups, sections, and committees;
- Supplemented the organizational structure with provisions for flexibility and with new ways to integrate thinking about common issues such as security or congestion; and
- Expanded outreach to attract more diverse and young participants into committee activities.

The Joint Summer Meeting of the Ports, Waterways, Freight, International Trade, Planning, Economics, Finance, Management, and Environmental Committees, held in Portland, Oregon, in July was a model for groups addressing common issues. More than 40 TRB committees met to conduct committee business and to attend a diversity of sessions in the various subject areas. Topics included port services, security, program delivery, intermodalism, freight transportation systems, and environment.

Another example was the 8th International Conference on Low-Volume Roads, developed by the specially appointed Committee on Low-Volume Roads, and held in Reno, Nevada, June 2003. The program attracted participants from 25 countries. Many domestic participants were from the U.S. Forest Service, county governments, and academia. The conference program included presentations of 95 peer-reviewed papers, included in the two-volume *Transportation Research Record: Journal of the Transportation Research Board, No. 1819*. The volumes contain papers on soil stabilization, pavement management, technology transfer, environment, safety, traffic, maintenance, materials, and structures. The Record is also available as a CD-ROM, which can be purchased through the TRB online bookstore at www.TRB.org.

TABLE 1 New Organization of TRB Technical Activities Division Standing Committees



For more background about the reorganization, revised committee locations and numbers, or for information on participating in the committees, visit the TRB website, www.TRB.org.

SHARING INFORMATION ON ISSUES OF INTEREST

The following is a summary of the activities undertaken in 2003 to carry out the division's mission of identifying research needs and sharing information about research of interest.

Research and Education

Representatives from 38 state DOTs attended and participated in the biennial meeting of TRB state representatives, May 5-6, 2003, at the TRB offices in Washington, D.C. The representatives first participated in a one-day workshop, Optimizing the Dissemination and Implementation of Research Results, sponsored by the TRB standing committees on Conduct of Research and Technology Transfer. The

workshop identified strategies for making optimal use of research results.

Supplementing the state DOT participants were representatives from city and county agencies, the private sector, academia, U.S. DOT, and libraries and information services, plus invited guests with unique perspectives on the topic. The workshop results are available on the TRB website.¹

The partnership between TRB and the state DOTs in disseminating research results was the focus of the next day's sessions for state representatives and TRB staff. Many suggestions were advanced to streamline and expedite the distribution of TRB-generated research reports to state DOTs.

Policy and Administration

The Technical Activities Division and the Cooperative Research Programs Division, along with the American Association of State Highway and Transportation

¹ http://gulliver.trb.org/news/blurp_detail.asp?id=1782.



State DOT representatives at workshop on Optimizing the Dissemination and Implementation of Research Results, sponsored by the TRB standing committees on Conduct of Research and Technology Transfer, in Washington, D.C., in May.

Officials (AASHTO) and the University of Minnesota's Center for Transportation Research, cosponsored a leadership forum for state DOT chief executive officers in Minneapolis, May 4–6, 2003. Participants identified key issues in strategic leadership, system operations, and service delivery. The forum report is currently in review.

Several circulars and conference proceedings resulted from conferences held in 2002. Circular E-C050 summarizes 78 presentations made at the Transportation and Economic Development conference in May 2002 in Portland, Oregon.² The conference was organized by the Transportation and Economic Development Committee.

Circular E-C054 summarizes the National Community Impact Assessment (CIA) Conference held in

Madison, Wisconsin, in May 2002.³ The conference was organized by a joint subcommittee with roots in the Social and Economic Factors Committee, the Public Involvement Committee, and the Environmental Analysis Committee. The CIA joint subcommittee sponsored regional workshops in Washington State and Indiana in 2003.

The findings and recommendations as well as a summary of the presentations from the 3rd National Transportation Finance Conference held in Chicago in October 2002 should be available in early 2004.

An International Symposium on Road Pricing convened November 19–22, 2003, in Key Biscayne, Florida, cosponsored by the Organisation for Economic Cooperation and Development. The conference proceedings will be available in 2004.

Transportation System Planning

The planning committees were active in 2003, convening several specialty conferences across the country, establishing a new task force, and publishing two reports.

The specialty conferences began with the 9th Conference on the Application of Transportation Planning Methods, in Baton Rouge, Louisiana, in April. The conference provided an opportunity for practitioners to share experience on a variety of transportation planning activities, emphasizing practical, innovative, and timely techniques.

In May, the Statewide Transportation Planning conference at Duck Key, Florida, focused on the

² Circular E-C050, <http://gulliver.trb.org/publications/circulars/ec050.pdf>

³ Circular E-C054, <http://gulliver.trb.org/publications/circulars/ec054/CircE-C054%20CIA.pdf>

The Technical Activities Council discusses restructuring during a meeting at Woods Hole, Massachusetts.



most critical issues facing transportation planners in state DOTs and other agencies. The conference examined the connections that state transportation planners make—for example, with customers, decision makers, and other agencies—and the future of these interactions. In conjunction with the conference, the Committee on Metropolitan Policy, Planning, and Processes held its first peer exchange, *Getting to Consensus: How Do Metropolitan Planning Organizations (MPOs) Make Effective Transportation Planning and Programming Decisions?*

A one-day Microsimulation Workshop in July, in conjunction with the Joint Summer Meeting in Portland, gathered a select group of academics and practitioners to discuss *Microsimulation Methods: A Retrospective and Prospective Assessment of Theoretical Issues and Practical Considerations*.

A new Task Force on Moving Activity-Based Procedures into Practice is working with the academic and practitioner communities to encourage the use of activity-based approaches in practice. The task force will develop educational and outreach tools to assist agencies undertaking activity-based modeling.

The Committee on Access Management completed development of the *Access Management Manual*. The 373-page manual—also available as a CD-ROM—provides information on access management techniques as well as pointers on developing and administering effective access management programs.

Data and Information Systems

The mechanisms and practices for using data and information technology to improve the operations of transportation organizations were a major thrust for the Data and Information Technology Committee during 2003. Environmental Spatial Information for Transportation: A Peer Exchange on Partnerships brought together representatives of transportation departments, natural resources agencies, and nonprofit organizations from four states to examine information-sharing practices that could improve program delivery in the environmental arena. Another peer exchange, *Data Partnerships: Making Connections for Effective Transportation Planning*, studied data partnering within state DOTs.

The TRB data committees worked with the National Research Council's Board on Earth Sciences and Resources to host a meeting of U.S. DOT and Housing and Urban Development officials. The agenda explored ways that geographic information systems could enhance efforts to improve housing, transportation, and regional development.



The Women's Issues in Transportation Committee meets during the TRB 2003 Annual Meeting.

Cooperation with the Bureau of Transportation Statistics (BTS) continued in the international arena, with the 17th North American Transportation Statistics Interchange in June. In addition, TRB worked with BTS to host a workshop on international freight data.

The importance of data in asset management initiatives led to the TRB data committees cooperating with AASHTO and other organizations to develop the 5th National Conferences on Asset Management: *Moving from Theory to Practice*, in Atlanta, Georgia, in September and in Seattle, Washington, in October. The two-location approach was designed to solve problems in travel funding—the conferences offered the same sessions but with many different local speakers, covering current practices in asset management.

Social, Economic, and Environmental Issues

In June, the Committee on Waste Management held its midyear meeting and conference in Portsmouth, New Hampshire, addressing Beneficial Use, Sustainability, and Pollution Prevention in Transportation Infrastructure.

The TRB Committee on Transportation-Related Noise and Vibration met in Phoenix, Arizona, in July. In addition to technical presentations, two workshops on noise barriers included question-and-answer sessions with panelists and other participants. The workshops also took field trips to many of the innovative noise barriers built by Arizona DOT in the Phoenix area.

A meeting on Partnerships for Environmentally Sensitive Transportation convened in July in Wilmington, North Carolina. The Committee on Environmental Analysis in Transportation and the Committee on Landscape and Environmental Design sponsored the program to discuss partnerships for



During a meeting in Phoenix, Arizona, in July, the TRB Committee on Transportation-Related Noise and Vibration toured highway sound and retaining walls that have unique surface treatments, like these on the Pima Freeway.

viable transportation systems that not only protect but also enhance the environment.

The Committee on Historic and Archeological Preservation in Transportation met in Vancouver, Washington, in July, amid the celebrations for the Lewis and Clark Expedition Bicentennial. Speakers and tours explored the significance of the expedition to Euro-Americans and Native Americans. A mobile workshop and bus tour highlighted the engineering and aesthetics of the Columbia River Gorge highway and bridges, as well as the related problems of maintenance and management.

The 9th Biennial Asilomar Conference on Transportation and Energy Policy focused on a possible transition to hydrogen for vehicles and for the transportation system. The goal was not to design a transition but to address what needs to happen for the changeover to take place and to explore whether the transition is likely, necessary, or even possible. The proceedings of the previous conference in the series was published in 2003 and is available on the TRB website.⁴

The International Conference on Ecology and Transportation (ICOET) was held in August in Lake Placid, New York. Conducted every two years, ICOET addresses ecological issues in surface transportation development, gathering the most current research and best practices in the areas of wildlife, fisheries, wetlands, water quality, overall ecosystems management, and related policy issues. The ICOET 2003 theme, Making Connections, focused on the relationship between ecology and transportation, specifically the links between ecosystems and transportation systems.

The Task Force on Ecology and Transportation was established in 2003 to support and disseminate ecological research on transportation systems to transportation professionals and to the agencies involved in the planning, design, construction, maintenance, and operation of transportation facilities.

The reports of two conferences were published this year: the National Forum on Assessing Historical Significance for Transportation Programs⁵ and

the Conference on Transportation Improvements: Experiences Among Tribal, Local, State, and Federal Governments.⁶ The Committee on Historic and Archeological Preservation in Transportation sponsored both conferences.

Design

The Roadside Safety Features Committee completed work on Transportation Research Circular E-C038, *Standards for Testing, Evaluating, and Locating Roadside Safety Features*, available on TRB's website.⁷

The pavement management committees cosponsored the 9th International Conference on Asphalt Pavements in August 2002 in Copenhagen, Denmark. The International Society of Asphalt Pavement has made the conference proceedings available on the web.

A Task Force on Context-Sensitive Design/Solutions was launched in 2003. Many of the task force members participated in the joint summer meeting of the Committees on Environmental Analysis in Transportation and the Committee on Landscape and Environmental Design, as well as in the subsequent workshop, Partnerships for Environmentally Sensitive Transportation, sponsored by the North Carolina Department of Transportation and the Center for Transportation in the Environment, North Carolina State University.

Construction and Materials

Before the 2003 TRB Annual Meeting, the standing committees in the Design and Construction Group posted on the TRB website a catalog of papers of interest to practitioners. The catalog linked to the interactive Annual Meeting program, allowing participants to locate the technical session that included each paper. The committees have identified practical papers and have disseminated the compilation for the past six years.

The Committee on Basic Research and Emerging Technologies Related to Concrete sponsored a well-attended workshop at the 2003 Annual Meeting, on Concrete Cracking: Basic Principles and Practical Experiences, which addressed the recent increase in premature cracking of concrete. Another workshop, Long-Term Warranties on Asphalt Pavements, sponsored by the Committee on General Issues in Asphalt

⁴ <http://trb.org/publications/conf/asilomar.pdf>

⁵ Circular E-C055, <http://gulliver.trb.org/publications/circulars/ec055.pdf>

⁶ Circular E-C039, <http://gulliver.trb.org/publications/circulars/ec039.pdf>

⁷ Circular E-C038, <http://gulliver.trb.org/publications/circulars/ec038/ec038.pdf>

Technology, presented the advantages and disadvantages of asphalt pavement contracts that include warranties of five years or more.

TRB cosponsored the National Seminar on the Moisture Sensitivity of Asphalt Pavements, February 4–6, 2003, a program initiated by the California Department of Transportation (Caltrans). The seminar provided a forum for technology transfer from leading experts, who discussed moisture damage in asphalt pavements, and for development of a plan to solve the problem of moisture damage. TRB is publishing the technical papers presented at the seminar, including notes from the discussion groups.

Two circulars dealing with hot-mix asphalt were posted on the TRB website: Circular E-C043, *Significance of Restricted Zone in Superpave Aggregate Gradation Specification*,⁸ sponsored by the Committee on General Issues in Asphalt Technology, and Circular E-C044, *Bailey Method for Gradation Selection in Hot-Mix Asphalt Mixture Design*,⁹ sponsored by the Committee on Characteristics of Bituminous-Aggregate Combinations to Meet Surface Requirements and the Committee on Characteristics of Bituminous Paving Mixtures to Meet Structural Requirements.

Soils, Geology, and Foundations

Committees on Engineering Geology and on Exploration and Classification of Earth Materials sponsored a symposium on Design and Construction of Transportation Facilities in Mélange—Block in Matrix in August 2002, immediately preceding the 53rd Highway Geology Symposium (HGS) in San Luis Obispo, California. In addition to presentations by experts in mélange geology, the program included a field trip for the more than 100 participants. Caltrans, the host agency, produced a CD-ROM of the HGS proceedings, including the TRB symposium.¹⁰

The committees in geotechnical engineering sponsored three workshops at the 2003 TRB Annual Meeting:

- Doctoral Student Research in Transportation Geotechnics,
- Innovative Technology for Accelerated Construction of Bridge and Embankments Foundations, and

- Subsurface Sensing Technology in Transportation Infrastructure.

The doctoral student workshop provided a forum for young researchers to showcase their work; the primary focus of the other two workshops was to disseminate information on recent advances in the state of the practice. The Federal Highway Administration (FHWA), cosponsor of the workshop on Accelerated Construction, is producing a CD-ROM of the presentations for release by the end of the year.

Operations

TRB's specially appointed Committee on Developing a Regional Concept for Managing Surface Transportation Operations conducted a stakeholder workshop to gain input on how to improve performance of the transportation system through the shared vision of systems operators, service providers, and public safety providers. The committee issued a letter report in July 2003 to FHWA's ITS Joint Program Office, calling for extended efforts to support regional transportation operations. The report includes recommendations on the role of a regional concept of operations within a framework of collaboration and cooperation and identifies elements that the concept should include.¹¹

TRB has established the Committee on Regional Transportation System Management and Operations to address specific issues in regional operations. The scope of this committee is as follows:

This committee is concerned with regional transportation systems management to maximize transportation system performance in metropolitan areas, including coordinated and integrated decision-making approaches to operations and the harmonization of operations with planning, construction, preservation, and maintenance of transportation facilities.

The committee is formulating priorities for 2004 through 2006. Initiatives include activities to communicate information to practitioners in regional transportation operations, along with activities to incorporate operations into the planning process.

High-occupancy vehicle (HOV) facilities continue to evolve with experience and with advances in technology. The term “managed lanes” has come into use to describe the strategies of HOV lanes, high-occupancy toll (HOT) lanes, value pricing, truck lanes, and other forms of dedicated lane treatments. The

⁸ Circular E-C043, <http://gulliver.trb.org/publications/circulars/ec043.pdf>

⁹ Circular E-C044, <http://gulliver.trb.org/publications/circulars/ec044.pdf>

¹⁰ The CD-ROM is available from HGS Publications; e-mail frgeol@aol.com.

¹¹ http://gulliver.trb.org/publications/reports/surftranops_jun_2003.pdf

managed lanes concept was a key topic at TRB's 11th International Conference on High-Occupancy Vehicle Systems: Evolution or Revolution?, which attracted more than 275 participants in October 2002.

Many issues are under debate in the area of geometric design and operations, and all came under discussion in July 2003 at the TRB-sponsored 2nd Urban Street Symposium. The symposium served as a forum for more than 200 participants who compared and debated alternative urban street design practices; discussed problems caused by certain design practices and identified alternatives; examined long-held urban street design practices in the context of the "new urbanism" movement; documented improvements in urban street design practices; shared experience and innovations; considered effective ways to transfer urban street research results to state and local agencies; and learned from how-to case studies and workshops.

The Committee on Vehicle-Highway Automation conducted a two-day workshop in August to explore the application of Intelligent Vehicle Initiative (IVI) technologies to bus rapid transit (BRT) systems. The goal was to help mitigate the safety concerns of BRT operations and to define the research efforts necessary to realize the vision of automated BRT systems. The background papers prepared for the workshop are available on the web.¹²

Safety

Safety was one of six spotlighted themes at the TRB 2003 Annual Meeting. Almost 60 technical sessions and 20 committee meetings covered diverse safety topics across all modes. A record number of technical papers in the subject area of safety have been submitted to peer review this year for the 2004 Annual Meeting.

The 36th Annual Human Factors in Transportation Workshop, with nine concurrent day-long sessions, drew record attendance in January. The diversity of disciplines represented at the workshop is increasing, fulfilling the original goal and vision for the series.

Through the Committee on Transportation Safety Management's Subcommittee on Safety-Conscious Planning (SCP), TRB participates in research and implementation of the TEA-21 mandate to integrate safety considerations into transportation planning. The second SCP Leadership Conference convened 60 planning and safety representatives from states that have held or are organizing SCP forums, to discuss

experiences implementing the procedures. Reports from current National Cooperative Highway Research Program (NCHRP) and FHWA research project contractors provided information on tools for SCP, as well as a glimpse of tools that will be coming online in the next few years.

A spring meeting of the Research and Technology Partnership Forum's Safety Group outlined a process that can be implemented in the next two years to improve the communication and coordination of safety research programs and results. In addition, FHWA is publishing white papers that identify key research findings and needs in the area of infrastructure safety, as well as gaps in safety research.

The highway safety manual continues in development; the subcommittee charged with the project is now a task force. At a midyear meeting, the task force convened and launched six subcommittees with responsibility for specific aspects of the manual. The AASHTO Standing Committee on Research accepted the task force's ideas for research to develop quantitative safety prediction models, making funding available to complete the research required for the first edition of the manual.

The use of visualization in design, planning, environmental assessment, public hearings and other transportation applications continues to expand. In the past 10 years, the Subcommittee on 3-D and 4-D Visualization—which in early 2003 became the Task Force on Visualization in Transportation—has conducted four national conferences to document the state of the art and to encourage development and use of visualization in transportation.

With the cost of hardware and software declining, plus advances in the ease of use and sophistication of visualization software, the subcommittee is focusing on expanded applications of the technology. A website and a listserve have assisted the task force in developing programs on visualization for several conferences.

Fatal crashes involving alcohol increased again this year. The Committee on Alcohol and Other Drugs held a two-day midyear technical meeting, "Putting Research into Action: A Symposium on the Implementation of Research-Based Impaired Driving Countermeasures." The meeting focused on identifying research that could be put to immediate use in the battle against drunk and drugged driving.

Maintenance

The Committee on Bridge Management Systems, in cooperation with FHWA, sponsored the 9th International Bridge Management Conference, April 28–30,

¹² <http://gulliver.trb.org/conferences/VHA-BRT/>.

2003, in Orlando, Florida. Sessions examined bridge management concepts, strategies and health indices, asset management, joints, coatings and concrete repair, life-cycle costs, load testing, Internet applications and performance measures, deterioration and reliability, future directions and challenges in bridge management systems, management system implementation, safety and serviceability, scour modeling and experience, expert systems and uncertainties, and concrete deterioration. Conference papers are available on the TRB website.¹³

The 10th Maintenance Management Conference was sponsored by the TRB Maintenance Section committees, in cooperation with AASHTO and FHWA, and hosted by the Minnesota DOT, July 13–17, 2003, in Duluth, Minnesota. The conferences have provided a forum every three to four years for the exchange of ideas and developments in the maintenance and operations management of transportation facilities. The conference was integrated into the Annual AASHTO Highway Subcommittee on Maintenance meeting and included topics corresponding to the subcommittee task forces on pavements, roadsides and environment, traffic services and safety, bridges, and snow and ice, and to focus groups on customer satisfaction, contract maintenance, workforce development, and equipment and maintenance management. Papers presented at this conference are available on the TRB website.¹⁴

Legal Resources

Transportation legal resources increasingly face problems when operational necessity runs against legal authority and individual civil rights, notably as transportation agencies respond to disasters and to the need for safeguards against terrorism. During 2003, the Legal Resources Group conducted several conferences and workshops, with the security of infrastructure and of data as recurring topics.

Several sessions at the TRB 2003 Annual Meeting addressed these topics. One session looked at the legal responses to the September 11, 2001, terrorist attacks and the World Trade Center disaster. Speakers examined the legal maneuvers involved in meeting the response needs. Another session with presentations on the protection of data also generated great interest.

The legal research program, through NCHRP and the Transit Cooperative Research Program (TCRP),

continued revisions to *Selected Studies in Transportation Law*. Three volumes have been published: Volume 3, *Environmental Law and Transportation*; Volume 4, *Tort Liability of Highway Agencies*; and Volume 6, *Transit Labor 13(c) Decisions*. NCHRP Legal Research Digest 47, *Civil Rights in Transportation Projects*, and TCRP Legal Research Digest 19, *The Impact of the Americans with Disabilities Act on Transit Operations* also were released.

Aviation

TRB hosted nearly 150 participants from industry, academia, and government in the most recent biennial series of three-day workshops examining the Federal Aviation Administration's aviation forecasts. The focus was on the post-September 11 environment and included all elements of the aviation industry, from international passenger service through general and business aviation to airports and manufacturing. The international community was well represented.

In response to community needs, the Committee on Aviation Economics and Forecasting produced a circular that surveyed methodologies for aviation demand forecasting. The circular was well received and gained praise for illustrating approaches to aviation forecasting that receive little public attention, but that are useful in thinking about aviation activity measurements and future outlooks. The annual aviation volume in the TRB Record series, on Airport and Air Traffic Economic and Operational Issues, featured 17 peer-reviewed papers.

Freight Systems

In recent years, freight transportation has become a critical concern for many transportation agencies in the public sector, particularly at the state and MPO level. TRB's freight-related committees have provided a venue for diverse discussions of freight topics at the Annual Meeting.

In addition, the committees have expanded their activities into two major annual midyear meetings: the Summer Ports, Waterways, Freight, and International Trade Conference; and the Joint Summer Meeting of the Planning, Economics, Finance, Freight, Management, and Environmental Committees. These activities have created opportunities for freight-related committees to work with groups concerned with more traditional public agency planning and programming, primarily for highways. These new relationships have expanded conversations about freight transportation to a range of topics and have resulted in cosponsorships of more diverse activities.

¹³ Circular E-C049, <http://gulliver.trb.org/publications/circulars/ec049.pdf>

¹⁴ Circular E-C052, <http://gulliver.trb.org/publications/circulars/ec052.pdf>



Panel on Freight Transportation System Issues at a half-day plenary session that bridged two annual midyear meetings in July: (from left) John Vickerman, Transsystems; Paul Nowicki, BNSF Railway; Randy Evans, CSX; Mort Downey, Parsons Brinckerhoff; Jeannie Beckett, Port of Tacoma, Washington; Tamar Henkin, TransTech Management, Inc.; Tom Wakeman, Port Authority of New York and New Jersey; Emil Frankel, Assistant Secretary for Transportation Policy, U.S. DOT; and Moderator Anne Canby, Surface Transportation Policy Project and Chair, TRB Technical Activities Council.

In July 2003, the two summer meetings were held sequentially at the same location for the first time in many years. The Portland, Oregon, programs offered several overlapping events, including a half-day plenary session on Freight Transportation System Issues, moderated by Technical Activities Chair Anne Canby. The session featured high-level speakers from the public and private sectors, who addressed national freight system issues, as well as options for infrastructure financing, security initiatives, and examples of freight corridors and gateways developed through public-private solutions.

Public Transportation

Committees in the Section on Public Transportation organized two conferences and published two web newsletters.

The 15th National Conference on Rural Public and Intercity Bus Transportation was held in Huron, Ohio, October 27–30, 2002, with more than 400 rural and intercity bus transit experts attending 46 sessions. Organized by the Committee on Rural Public and Intercity Bus Transportation, the conference was cosponsored by the Ohio Department of Transportation and the Federal Transit Administration with the assistance of many state, regional, and local agencies.

Five rail transit committees presented the 5th Rail Passenger Caucus in Montreal, Quebec, Canada, in November 2002. The committees on Intermodal Transfer Facilities, Rail Transit Systems, Commuter Rail Transportation, Light Rail Transit, and Intercity Rail Passenger Systems sponsored the meeting.

Five participating Canadian transit agencies provided special briefings and facility tours.

The web newsletters posted in 2003 were the *Bus Transit Systems Newsletter*, sponsored by the Committee on Bus Transit;¹⁵ and two issues of *LRT News*, developed by the Committee on Light Rail Transit.¹⁶

Rail

The future of intercity rail passenger services in the United States remains an issue for debate among stakeholders and in Congress. The Committee on Intercity Passenger Rail Systems has assembled TRB Annual Meeting sessions featuring high-level policy makers from the federal government, Amtrak, state DOTs, and other stakeholders and plans a similar session in January 2004.

In outreach efforts to the larger community, the committees on Intercity Rail Passenger Systems and on Guided Intercity Passenger Transportation held midyear meetings in conjunction with the annual conference of the High-Speed Ground Transportation Association. In addition, the Committee on Intercity Rail Passenger Systems published an electronic newsletter, *Intercity Rail Passenger Systems Update*, highlighting the Amtrak situation, European rail developments, and the state of Washington's environmental process for rail passenger improvement projects.¹⁷

Although improvements in railroad industry safety records have been well documented, challenges remain. A daylong workshop on Railroad Safety, Derailment Protection, and Risk Assessment, sponsored at the TRB 2003 Annual Meeting by the committees on Railroad Track Structure System Design and on Guided Intercity Passenger Transportation, dealt with safety statistics—what the data reveal about accident causes and what the data may not reveal about other aspects of safety. Presentations on derailment prevention focused on best practices in the industry, and descriptions of risk assessment methods included current examples.

Marine

Security remains a major focus for the nation's ports and waterways. TRB and Marine Board activities throughout the year addressed a range of marine-related security issues.

¹⁵ Volume 3, No. 1, April 2003, <http://www4.trb.org/trb/onlinepubs/nst/web/BTS>

¹⁶ Volume 17, No. 1, December 2002; Volume 18, No. 1, May 2003; http://www4.trb.org/trb/onlinepubs/nst/web/LRT_News

¹⁷ No. 9, Spring 2003, http://gulliver.trb.org/publications/irps/irps_9.pdf



Thomas D. Larson (*left*), displays the 2003 Frank Turner Medal for Lifetime Achievement in Transportation, which was presented at TRB's 82nd Annual Meeting in Washington, D.C., in January. He is joined by Genevieve Giuliano (*center*) and Robert E. Skinner, Jr. (*right*). Skinner introduced Larson as "a role model of the highest order," whose distinguished and wide-ranging career has included research, teaching, and the top posts in Pennsylvania DOT and FHWA, as well as longtime volunteer leadership in TRB, the National Academies, and other organizations.



The TRB Executive Committee renamed the Distinguished Lectureship in honor of past Executive Director Thomas B. Deen (*left*), who delivered the 2003 lecture on "Policy Versus the Market: Transportation's Battleground." E. Dean Carlson, 2002 Executive Committee Chair, presents the award plaque to Deen.



Longtime TRB activist and leader Martin Wachs, Director of the Institute of Transportation Studies at the University of California, Berkeley, received the W.N. Carey, Jr., Distinguished Service Award.



John R. Meyer, Professor Emeritus at Harvard University, received the Roy W. Crum Distinguished Service Award for outstanding achievement in the field of transportation research.

In addition to TRB Annual Meeting sessions, the Marine Board held a focus session on the benefits and costs of transportation security investment at its spring meeting and on liquid natural gas transport at its fall meeting. In August, the Marine Board hosted a workshop on Marine Salvage Response Capability, examining the nation's ability to respond to simultaneous maritime terrorist events in major U.S. ports.

The TRB Summer Ports, Waterways, Freight, and International Trade Conference in Portland, Oregon, included security-related presentations from the Transportation Security Administration and the U.S. Coast Guard, as well as coastal and inland waterway port and vessel operators. Several of these presentations are available on the TRB website.¹⁸

The marine transportation system (MTS) initiative remains on the agenda of the many federal agencies involved; however, the future for SEA-21 legislation—a comprehensive national package similar to TEA-21 for highways and transit—is unclear. In response to a request from several agencies, TRB and the Marine Board formed an independent committee to examine the federal role in the MTS. The committee was briefed by representatives from several federal agencies, as well as by representatives of carriers, shippers, ports, and the military. The final

report from this specially appointed committee is expected in late 2003.

The MTS community has indicated interest in exploring short sea or coastal shipping to help relieve highway congestion. The Marine Board hosted a focus session on this topic at its spring meeting, with invited expert presentations. These are now available on the Marine Board website.¹⁹

TRB formed a Marine Environmental Task Force in 2003, to focus on the impact of marine transportation on the environment and the impact of transportation on the marine environment. Initial activities and areas of interest include dredging, air emissions from port operations, pollution, ballast water, and issues relating to nonindigenous species. The task force organized a session at the summer meeting in Portland and received a good response to a call for papers for the 2004 Annual Meeting. The task force will join other standing committees in the new Technical Activities Division Marine Group, to be overseen by the Marine Board.

In 2003, TRB's marine-related committees continued to interact with other organizations. AASHTO's Standing Committee on Water Transportation, the American Association of Port Authorities' Planning and Research Committee, and the Maritime Admin-

¹⁸ http://gulliver.trb.org/conferences/JM/Port_Presentations.pdf

¹⁹ http://www4.trb.org/trb/homepage.nsf/web/marine_board?OpenDocument



Terminal (*top*) and lift bridge in the Port of Portland, which several committees toured during a joint midyear meeting.

istration's Cargo-Handling Cooperative Program met in Portland in conjunction with TRB's summer conference. The conference attendees also toured the Bonneville Lock and Dam, in a program hosted by the U.S. Army Corps of Engineers, and the Port of Portland.

Pedestrians and Cycles

The number of pedestrian deaths in 2002 declined from 4,901 to 4,808, and the number of fatalities among riders of pedalcycles—bicycles and related pedal-powered vehicles—dropped from 732 to 662. Nonetheless, these totals represent 12.7 percent of all highway fatalities and remain an issue for continued emphasis by TRB committees.

Research activity in these areas continues to grow, as evidenced by sessions at the 2003 TRB Annual Meeting and paper submissions for 2004. The Committee on Pedestrians, for example, received 37 papers for 2004, up from 26 in 2003, and the Committee on Bicycling received 16 papers, up from 9 in 2003.

Bicycle and pedestrian research, stimulated by the Intermodal Surface Transportation Efficiency Act of 1991, has surged again in the past four years. TRB Annual Meetings offer sessions and technical committee and subcommittee meetings for researchers interested in bicycle and pedestrian issues, covering diverse areas, such as planning, facilities design and engineering, integration with other modes, level-of-service modeling, safety, and mode choice.

The Americans with Disabilities Act regulations affecting pedestrian facility design and operation are a focus of the Pedestrian Committee, which has organized full-day programs at the annual Human Factors in Transportation Workshop, has sponsored conference sessions at which the Access Board presented proposed regulations, and is organizing a 2004 workshop on "Universal Accessible Intersections and Pedestrian Human Factors."

Of particular interest to the Pedestrian Committee is a newly formed Joint Subcommittee on Roundabouts, cosponsored by eight TRB technical committees. Data on the operational and safety effectiveness of roundabouts in the United States are generally positive. Unresolved issues about pedestrian access, particularly for the visually impaired, however, loom large. Research, intelligent transportation systems, and creative design solutions should generate topics for a spring 2005 international conference on roundabouts, sponsored by the joint subcommittee.

The year-old AASHTO Task Force on Nonmotorized Transportation met with state DOT pedestrian and bicycle coordinators in 2003. The chairs of the TRB Pedestrian and Bicycle Transportation Committees made presentations at the meeting and worked to establish liaisons and cooperative links with the participating groups. The TRB Committee on Nonmotorized Transportation in Developing Countries was renamed the Committee on Transportation in Developing Countries, reflecting a change in scope to incorporate the interactions with other modes.

STAFF NEWS

Elaine King, Senior Program Officer and Rail Transport Specialist, received an Individual Distinguished Service Award from the National Academies, citing her "efforts to expand [TRB's] involvement in freight movement and rail issues and to increase the diversity of individuals involved in TRB activities."

STUDIES AND INFORMATION SERVICES



Martin Wachs
Chair
Subcommittee on
Planning and
Policy Review

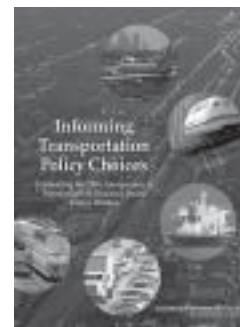


Stephen R. Godwin
Director
Studies and Information
Services

The Studies and Information Services Division conducts policy studies at the request of the U.S. Congress, executive branch agencies, states, and other sponsors; operates a bibliographic database of completed research and provides library reference services; and produces syntheses of current practices in highway and transit operations.

POLICY STUDIES

TRB's Policy Studies group assembles study committees drawn from the nation's leading experts to produce reports examining complex and controversial transportation issues. Studies cover all modes of transportation and a variety of safety, economic, environmental, and research policy issues. The Executive Committee's Subcommittee on Planning and Policy Review, chaired by Martin Wachs, Director of the Institute of Transportation Studies, University of California, Berkeley, provides oversight for TRB's policy work. Since 1998, all completed policy study reports have been posted on TRB's website, www.TRB.org. *Informing Transportation Policy Choices*, an overview of all of TRB's policy studies between 1983 and 2002, is also posted on the Policy Studies page of the TRB website.¹



¹ <http://gulliver.trb.org/publications/policy/itpc.pdf>

Completed Studies

Special Report 272, Airport Research Needs: Cooperative Solutions

In legislation reauthorizing the Federal Aviation Administration (FAA) in 2000, Congress requested a formal study of “the applicability of the techniques used to fund and administer research under the National Cooperative Highway Research Program and the Transit Cooperative Research Program to the research needs of airports.” In its report, the committee concludes that the cooperative research model not only is applicable but has become essential for ensuring airport security, efficiency, safety, and environmental compatibility. The committee urges Congress to establish a \$30 million annual program of airport cooperative research and recommends specific means of financing, governing, and managing the program. The House–Senate conference on the 2003 FAA reauthorization legislation calls for a 4-year pilot program, funded at \$10 million per year.



Special Report 273, Shipboard Automatic Identification System Displays: Meeting the Needs of Mariners

The U.S. Coast Guard (USCG) is responsible for implementing an international standard for automatic identification systems (AIS) under development by the International Maritime Organization (IMO). Although primarily an aid in vessel traffic management, AIS has other potential applications for mariners, including collision avoidance.

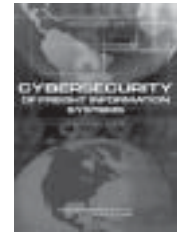


The supporting AIS standards in development require only a rudimentary display of information; the USCG therefore requested the assistance of the TRB Marine Board in developing regulations for displays on U.S. vessels. The USCG would like to apply the IMO standard—which is for ocean vessels—to all commercial vessels, including those on inland waterways and rivers.

The committee's report identifies the benefits and potential disadvantages of AIS displays, particularly the potential for increased errors from overreliance on automation and from the visual clutter of too many systems vying for mariners' attention. The committee recommends a program of research, as well as steps for implementation, before USCG regulates AIS displays.

Special Report 274, Cybersecurity of Freight Information Systems: A Scoping Study

The U.S. Department of Transportation (DOT) requested the National Research Council (NRC) of the National Academies to form a committee to develop an approach for gaining an inventory of information, computer, and communications applications in freight transportation and to assess the vulnerability of current and future information systems to disruption by criminals and terrorists. NRC formed the Committee on Freight Transportation Information Systems Security under the auspices of TRB and the Computer Science and Telecommunications Board.



After the study began, the federal government moved the Transportation Security Administration to the Department of Homeland Security (DHS), along with many of the related security functions formerly performed by U.S. DOT. Many of the committee's recommendations and comments, therefore, are directed to DHS, as well as to U.S. DOT. The report outlines options for a full study that would assess challenges to cybersecurity in freight transportation information systems and that would develop a strategy to reduce vulnerability to cyberattack.

Special Report 275, The Workforce Challenge: Recruiting, Training, and Retaining Qualified Workers for Transportation and Transit Agencies

This self-initiated study—funded with assistance from the Federal Highway Administration (FHWA), the U.S. DOT Research and Special Programs Administration (RSPA), and the American Association of State Highway and Transportation Officials (AASHTO)—reviews workforce development issues in state DOTs and transit agencies and recommends steps that agencies can take to prepare for the future. The committee finds that changes in the missions of many agencies require new and expanded skills to supplement the traditional reliance on civil engineering. Program growth is coinciding with a decline in staffing; contracting out for services is becoming more common; senior staff are retiring in unprecedented numbers; recruiting and retaining competent professional and technical staff are difficult; and investments in human resource development are inadequate.



The committee recommends making human resource development not only a priority but a strategic function within agencies; increasing agency investments and federal funding for training; and partnering with colleges, universities, and community colleges to develop curricula, training courses, and training procedures.

Special Report 276,
A Concept for a National Freight Data Program

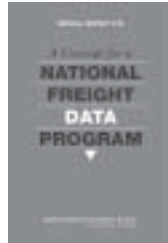
The effectiveness and efficiency of the nation's freight transportation system depend on reliable data that inform decisions at all levels of government and in the private sector about economic and infrastructure investments and policy issues. Because the collection of data on goods movement is not coordinated, the data sets vary in quality and reliability and provide an incomplete picture of the universe of freight movements.

To remedy these deficiencies, the Bureau of Transportation Statistics (BTS) asked TRB to conduct a study to recommend a framework for the development of national freight data. The report proposes a concept for a framework to guide the development of a national freight database, along with related data collection and synthesis activities.

The national freight database would fulfill the major needs of a variety of users by capturing the important characteristics of freight movements—namely, shipment origin and destination; commodity characteristics, weight, and value; modes of shipment; routing and time of day; and vehicle or vessel type and configuration. The database also forms a foundation on which users can build specialized data sets. The study committee offers U.S. DOT and BTS specific guidance on developing a multiyear program to implement the framework concept.

Special Report 277, *Measuring Personal Travel and Goods Movement: A Review of the Bureau of Transportation Statistics' Surveys*

The Transportation Equity Act for the 21st Century (TEA-21) authorized BTS for a 6-year period, 1998 through 2003. With reauthorization of TEA-21 pending, BTS asked TRB and the Committee on National Statistics to review the agency's current survey programs in light of (a) transportation data needs for policy planning and research and (b) the characteris-



tics and functions of an effective statistical agency. The committee reviewed the three major BTS surveys—the National Household Travel Survey, the Commodity Flow Survey, and the Omnibus survey program; the final report identifies major themes and offers crosscutting guidance. Recommendations focus on opportunities to make the flagship surveys of personal travel and freight more effective in meeting the needs of data users.

Special Report 278, *Buckling Up: Technologies To Increase Seat Belt Use*

The use of seat belts is one of the most effective strategies for avoiding death and injury in a crash. Nearly 35 years since the federal government required that all passenger cars be equipped with seat belts, however, approximately one-quarter of U.S. drivers and front-seat passengers do not buckle up. In appropriations legislation for fiscal year 2002, Congress requested a study to examine newly developed vehicle technologies to increase seat belt use.

The TRB study committee examined the potential benefits and acceptability of the technologies, as well as the legislative and regulatory actions required to install the devices in passenger vehicles. The committee concludes that new technologies to promote seat belt use—in particular, reminder systems that continue longer than the 4 to 8 seconds required by the National Highway Traffic Safety Administration (NHTSA)—have the potential to increase belt use and be received favorably by consumers, especially by occasional users who would welcome a reminder to buckle up. The committee recommends that Congress give NHTSA the authority to require more effective belt-reminder technologies if voluntary industry efforts do not produce sufficient and timely results.



Ongoing Studies

Federal Role in the Marine Transportation System

Several federal agencies with maritime responsibilities—including USCG, the National Oceanic and Atmospheric Administration (NOAA), the U.S. Army Corps of Engineers (USACE), the Customs Service, and the Maritime Administration—requested and sponsored this





(From left) Rolf Schmidt and Bruce Lambert of the Federal Highway Administration, with Policy Studies and Information Services Director Stephen Godwin, prepare for presentations to a study committee.

study to assist in developing an analytic framework for the federal government to guide marine transportation programs and policies.

Review of the Intelligent Transportation Systems Standards Program

U.S. DOT's Joint Program Office requested that a TRB committee conduct a Phase 2 review of the Intelligent Transportation Systems (ITS) Standards Program, particularly of progress in achieving adoption of ITS standards in practice. Phase 2 follows up on a report published in 2000, *Standards for Intelligent Transportation Systems: Review of the Federal Program*.

Review of the Large Truck Crash Causation Study

At the request of the Federal Motor Carrier Safety Administration, a TRB committee reviewed the agency's major, multiyear study on the causes of crashes involving large commercial trucks and issued comments in a series of letter reports. Congress required the agency to conduct the study to aid in developing strategies for avoiding truck crashes. In September 2003, the committee delivered its fifth and final letter report.² Recommendations cover analysis methods for data from the study, data quality control, and lessons for future studies of crash causes.



Long-Term Viability of Fuel Taxes for Transportation Finance

This self-initiated study, funded with assistance from FHWA and AASHTO, will describe the current policy framework of transportation finance—particularly the prospects for continued reliance on the gas tax—and will evaluate options for a long-term transition to other sources of funding.

Physical Activity, Public Health, Transportation, and Land Use

In September 2002, TRB received funding from the Robert Wood Johnson Foundation to review, in collaboration with the Institute of Medicine, the links established in research between physical activity, public health, transportation, and land use. A study committee is summarizing what is known about these relationships, including the implications for policy decisions at the local, state, and federal levels, and is identifying priorities for research.



Pipelines and Public Safety: Effective Measures for Limiting Encroachment of Existing and Future Rights-of-Way, Phase 1

In conjunction with the Federal Energy Regulation Commission, RSPA has requested a study of land use practices, including zoning ordinances, to mitigate the hazards and risks of encroachment on pipeline rights-of-way for the public, utility workers, and the environment. Phase 1 will assess land use and zoning practices and will examine the feasibility of developing risk-based guidelines for state and local governments.



Research and Technology Coordinating Committee

The Research and Technology Coordinating Committee (RTCC) reviews and offers guidance to U.S. highway research programs at the federal and state levels. The committee meets three times a year and usually communicates advice to FHWA via letter reports.³

In April RTCC sponsored a symposium to examine whether highway transportation research and technology (R&T) programs—conducted by the federal government, state governments, universities, and the private sector—are adequate for addressing

² http://gulliver.trb.org/publications/reports/tccs_sept_2003.pdf

³ http://gulliver.trb.org/publications/reports/rtcc_sept_2003.pdf

the national priorities identified by the National Highway R&T Partnership. Participants represented the range of stakeholders in highway research, development, and innovation. In addition to focusing on the available and expected resources for meeting research needs, the symposium examined the effectiveness of stakeholder involvement and of coordination among research programs.

Review of the Federal Railroad Administration Research, Development, and Demonstration Programs

At the request of Congress, a TRB committee reviews the Federal Railroad Administration's (FRA) research and development programs. The review systematically analyzes budget proposals, program management, and project updates on research and development and on next-generation high-speed rail programs. The committee meets semiannually to review FRA programs and provides guidance through letter reports. The committee's most recent report is dated April 22, 2003.⁴

Review of the Intelligent Vehicle Initiative

At the request of the ITS Joint Program Office (JPO) of U.S. DOT, a committee is conducting a multiyear peer review of the Intelligent Vehicle Initiative (IVI), Phase 2. Phase 2 follows up on a previous 3-year peer review (Phase 1) that ended in 2002. The objectives of the IVI program are to prevent driver distraction and to facilitate accelerated development and deployment of crash avoidance systems.

The committee will review the progress of the IVI program in meeting the goals, offer guidance on the efficacy of establishing numerical outcomes to measure progress, and provide guidance on the nature and quality of IVI's collaboration with industry and other stakeholders. Additionally, JPO requested that the committee determine whether the program's human factors activities are appropriate and adequate; comment on whether U.S. DOT has focused on the right issues for light vehicles; and provide guidance on how the agency can improve private-sector involvement. The committee's most recent letter report is dated June 24, 2003.⁵

Review of Travel Demand Modeling by the Metropolitan Washington Council of Governments

At the request of the Metropolitan Washington Council of Governments, TRB has convened a panel



Members of the Committee on the Future of the Federal Highway Administration's Freight Analysis Framework (from left), C. Michael Walton of the University of Texas at Austin and Chair Armin H. Meyburg of Cornell University, with TRB Study Director Jill Wilson, share a light moment as work gets under way.

of experts to review the state of the practice of travel demand modeling by the council's Transportation Planning Board (TPB). The request is part of an ongoing program to upgrade TPB's travel forecasting methods and to respond to federal guidance on modeling for areas that do not attain air quality standards. The committee's first letter report is dated September 8, 2003.⁶

Transit Research and Development: Federal Role in the National Program

The Federal Transit Administration (FTA) has requested TRB to form a committee for an independent review and assessment of how the needs of the public transportation industry could be met through investment in a national research and technology program. The committee will advise FTA on the appropriate federal role in transit research, on stakeholder involvement in the federal research program, and on proposals for high-priority federal research.

Other Studies

TRB is assisting other NRC units with studies on the transportation of radioactive waste, the ecological impacts of road density, a review of the USACE restructured Upper Mississippi River-Illinois Waterway, and an assessment of security technologies for transportation.

⁴ <http://gulliver.trb.org/publications/reports/frardd3.pdf>

⁵ http://gulliver.trb.org/publications/reports/its_june_2003.pdf

⁶ <http://gulliver.trb.org/publications/reports/mwcosept03.pdf>

TRB POLICY STUDIES: IMPACT ON LEGISLATION AND LEGISLATIVE PROPOSALS

In 2003 several TRB studies influenced reauthorization proposals for surface transportation and aviation, particularly in the area of research. If adopted, the research initiatives recommended by TRB committees would receive a total of nearly \$100 million in additional annual funding.

The Administration's bill—the Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003 (SAFETEA)—draws from information and recommendations in Special Report 261, *The Federal Role in Highway Research and Technology*. In addition to citing the TRB report, the bill adopts recommendations for increased emphasis on longer-term advanced research, greater stakeholder involvement in the federal program, and more formal mechanisms for peer review and for evaluation of completed research. Like the reauthorization proposals from Senate and House committees, SAFETEA also endorses the recommendations for a surface transportation environmental cooperative research program, presented in Special Report 268, *Surface Transportation Environmental Research: A Long-Term Strategy*.

Another TRB study, Special Report 264, *The Congestion Mitigation and Air Quality Improvement Program: Assessing 10 Years of Experience*, includes recommendations to continue and enhance the CMAQ program. Some of these are adopted in SAFETEA provisions.

The American Association of State Highway and Transportation Officials strongly endorsed Special Report 260, *Strategic Highway Research: Saving Lives, Reducing Congestion, Improving Quality of Life*, as well as Special Report 268. Both the House of Representatives and Senate versions of the surface transportation reauthorization bills have included provisions adopting the recommendations.

In the draft of the reauthorization of the Federal Aviation Administration (FAA), the House Committee on Science incorporated the recommendations for an airport cooperative research program, presented in Special Report 272, *Airport Research Needs: Cooperative Solutions*—also endorsed by the Airports Council International–North America. The House–Senate conference on FAA reauthorization then approved a bill that includes a provision for an airport cooperative research program.

TRANSPORTATION RESEARCH INFORMATION SERVICES

The Transportation Research Information Services (TRIS) database is the world's largest online bibliographic database of transportation information. TRIS contains more than 580,000 records of published and ongoing research in all modes and disciplines of transportation. In the past year TRIS added more than 25,000 new records.

TRIS is available on the Internet as TRIS Online through the BTS National Transportation Library website. TRB produces and maintains TRIS, and BTS makes TRIS accessible without charge on the web. TRIS Online provides links from TRIS records to the full text of electronic documents or to direct ordering information from suppliers—approximately 13,500 TRIS records are linked to the full text, and 70,000 are linked for direct ordering from the National Technical Information Service (NTIS) or from TRB.

In addition, TRIS is available through two fee-based services—Dialog, Inc., and TRANSPORT. TRANSPORT, a CD-ROM product also available on

the web, is produced and distributed by Ovid. TRANSPORT is a cooperative effort between TRB and the International Transport Research Documentation database of the Organisation for Economic Cooperation and Development.

TRB is completing the development and implementation of a new production system for TRIS. The new system will improve productivity and expand services.

Research in Progress

TRB's user-friendly Research in Progress (RiP) website⁷ provides a searchable database of all 7,000 records of current or recently completed research projects. The RiP website allows state DOT researchers to add, modify, or delete records through a web-based data entry system developed under National Cooperative Highway Research Program (NCHRP) Project 20-39. Also available through the RiP website is a current awareness service that notifies users of new projects in specific subject areas.

⁷ rip.TRB.org

TRB Library

The TRB Library is a small, specialized library that provides reference and information services to TRB sponsors and staff. The library houses a complete collection of TRB, Highway Research Board, Strategic Highway Research Program, and Marine Board publications. The library maintains three searchable databases on TRB's website—the PATH database, the Research in Progress database, and the TRB Publications Index.

The TRB Publications Index contains 24,000 records of all individually authored papers, articles, and reports published by the Board and the Strategic Highway Research Program since 1974. The index allows browsing of search results in the record fields and provides links from individual records to TRB's Online Bookstore or to the full-text electronic publication. Plans are to integrate the TRB Publications Index and the online Bookstore, allowing users to search and order documents more easily.

SYNTHESIS OF INFORMATION REPORTS

Under the sponsorship of the Cooperative Research Programs administered by TRB, the Synthesis Unit prepares reports on current practice and knowledge in key highway and transit topics. Practitioners and researchers make extensive use of these reports.



The topics for study are selected annually by highway and transit committees of the Cooperative Research Programs. Each synthesis report is then researched and written by a consultant experienced in the topic area, under the guidance of an expert panel. All new synthesis reports are published electronically on the TRB website, as well as in hard copy.⁸

⁸ <http://www4.trb.org/trb/synthesis.nsf>



Home page for updated and expanded Research in Progress database.

The 23 synthesis reports issued in 2003 covered such topics as

- System engineering for traffic signal systems,
- Transportation planning and management for special events,
- Red-light camera enforcement and crash experience,
- Performance measures for highway segments and systems,
- Strategies for managing truck traffic,
- Safe and quick clearance of traffic incidents,
- Diversity training initiatives,
- Corporate culture and transit leadership practices, and
- Real-time bus arrival information systems.

Reports published during the past 12 months are listed on pages 48 and 49.

The TRB website includes information on synthesis topics under study, along with links to published syntheses. The website also may be used to propose new topics for study, or to nominate topic consultants and panel members.

COOPERATIVE RESEARCH PROGRAMS



Kam Movassaghi
Chair
AASHTO Standing
Committee on Research



J. Barry Barker
Chair
TCRP Oversight and
Project Selection
Committee



Robert J. Reilly
Director
Cooperative Research
Programs

TRB administers three 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); and
- The Commercial Truck and Bus Safety Synthesis Program, sponsored by the Federal Motor Carrier Safety Administration (FMCSA).

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

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

Since 1962, NCHRP has administered 1,091 research projects. A total of 833 publications have appeared in the *NCHRP Report* and *NCHRP Synthesis of Highway Practice* series, in addition to 280 volumes of *Research Results Digest* and 48 of *Legal Research Digest*, as well as 84 other documents published electronically.

NCHRP projects for federal fiscal year 2003 were placed under contract as funds became available during the year. Proposal solicitations for 37 research projects in federal fiscal year 2004 (October 1, 2003, through September 30, 2004) were released starting in July 2003; depending on the availability of the funding to be appropriated in pending federal legis-

lation, contracts should be executed in the first three months of 2004.

The increase in state planning and research funds under the Transportation Equity Act for the 21st Century (TEA-21) brought proportional increases in NCHRP funding. Funding available for NCHRP in fiscal year 2003 totaled about \$28 million. The amount available for fiscal year 2004 is not yet known.

AASHTO considered 157 problem statements for the fiscal year 2004 program. This strong response from the states and AASHTO committees—in terms of both quantity and quality—ensures optimal use of the authorized funds. In September 2003, AASHTO began to formulate the fiscal year 2005 program and will determine the program content in March 2004.

NCHRP reports published during the past 12 months are listed on pages 48–49. More than 200 projects were under contract as of December 31, 2003, with almost 100 additional projects under development or awaiting contract.

Each NCHRP study follows an approved research plan under the guidance of a panel of technical specialists and experienced practitioners. The panel ensures the credibility of the research findings, facilitating adoption by AASHTO, state departments of transportation, and other organizations. NCHRP panels convened for more than 100 project meetings in 2003; panel members contributed more than 2,000 days of volunteer time attending meetings and a comparable amount of time reviewing materials. More than 1,700 volunteers expend time and energy to benefit NCHRP, primarily for the challenges and the satisfaction of making significant contributions to the field.

Many NCHRP research projects have had a direct impact on practice through products such as specifications, manuals, and guidelines. The program emphasizes working with practitioners who will use the research results. NCHRP's close relationship with AASHTO committees is important in carrying out this goal—approximately 69 percent of the research funds for fiscal year 2004 was allocated for 27 projects requested by 16 AASHTO committees.

Experience has shown that AASHTO committees are more likely to use NCHRP research results when (a) the committee identifies and requests the research, (b) committee members serve on the advisory panel guiding the study, and (c) findings and recommendations are presented to the committee at the conclusion of the study. NCHRP projects frequently incorporate these three steps.



Dennis Judycki of the Federal Highway Administration speaks at a meeting of the AASHTO Research Advisory Committee—Standing Committee on Research at the TRB Annual Meeting in January.

Many NCHRP projects are developing revisions to AASHTO publications at the request of committees. When AASHTO adopts an NCHRP project's recommendations as a guide or specification, practitioners who might not be able to stay abreast of research results benefit from having the best information available through the AASHTO documents.

Details on the program from 1962 through 1988 can be found in *NCHRP Summary of Progress Through 1988*. Details on work since 1988 are available in *NCHRP Summary of Progress, December 31, 2003*, and on the web.¹

NCHRP studies of particular importance to AASHTO that were completed during the past year are highlighted in the following sections.

Transportation Asset Management

NCHRP Project 20-24(11), Asset Management Guidance for Transportation Agencies, produced an Asset Management Guide, which has been adopted by AASHTO and is pending publication. The guide shows how asset management can benefit decision making and assist in the allocation of resources for the preservation, operation, and improvement of transportation infrastructure. FHWA will use the guide as a principal resource for a National Highway Institute training course.

Security

Security continues to be a priority for transportation agencies and therefore for NCHRP, which has allo-

¹ <http://trb.org/nchrp>

cated \$4 million to security research on a variety of topics in the NCHRP Project 20-59 series. The panels and researchers are working closely with the AASHTO Task Force on Transportation Security.

Bridges and Structures Research

NCHRP and the AASHTO Highway Subcommittee on Bridges and Structures have enjoyed a close working relationship over the years—the subcommittee suggests problems for research and then makes use of the results. Recent publications of interest to the subcommittee and the structural engineering community include the following:

- NCHRP Report 483, *Bridge Life-Cycle Cost Analysis* contains a methodology, guidance manual, and software for the analyses.
- NCHRP Report 485, *Bridge Software—Validation Guidelines and Examples* presents a process for validating design and analysis software.
- NCHRP Report 489, *Design of Highway Bridges for Extreme Events* develops a design procedure for dealing with catastrophic loadings.
- NCHRP Report 494, *Structural Supports for Highway Signs, Luminaires, and Traffic Signals* recommends updates and refinements to current specifications.
- NCHRP Report 495, *Effect of Truck Weight on Bridge Network Costs* includes a methodology and software module for estimating the effect of changes in truck weight limits on bridge network costs.
- NCHRP Report 496, *Prestress Losses in Pretensioned High-Strength Concrete Bridge Girders* produces guidelines for estimating prestress loss to improve the economics and design of girders.
- NCHRP Report 503, *Application of Fiber-Reinforced Composites to Highway Infrastruc-*

ture—Strategic Plan assembles white papers detailing five promising near-term applications of fiber-reinforced polymer composites, along with a strategic plan.

- NCHRP Report 507, *LRFD Deep Foundation Design* recommends resistance factors for pile and drilled shaft bridge foundations.

Management of Transportation Agencies

In addition to producing the asset management guide, NCHRP Project 20-24 is addressing other needs identified by top management of state DOTs. In the past year, the project has released a report on outsourcing major program responsibilities, a best practices guide for partnering with resource agencies (published by AASHTO), a strategic performance measurements handbook (published by AASHTO), and proceedings for three conferences on transportation's interaction with various economic sectors.

NCHRP also supported a Chief Executive Officer Leadership Forum in Minneapolis, Minnesota, in May 2003. Top managers from 21 states gathered to share experiences and identify action items to improve decision making at the top level of DOTs in the areas of strategic leadership, program delivery, and operations.

Nighttime Construction

Preserving and upgrading the nation's infrastructure, especially on heavily traveled highways, can be extremely challenging. Agencies find that more work must be done at night, when traffic is lighter, but nighttime work presents new and different challenges. NCHRP has published reports on assessing and planning nighttime highway construction and maintenance and has generated guidelines for the design and operation of nighttime traffic control. The recently published NCHRP Report 498, *Illumination Guidelines for Nighttime Highway Work*, complements the available guidance with practical information on a critical topic.

F[uture]-SHRP

With shared FHWA financial support, NCHRP has just completed detailed work plans for the four theme areas of F-SHRP as proposed in TRB Special Report 260, *Strategic Highway Research*. The four work plans, as well as a summary report (NCHRP Report 510), are available on the TRB website.²



Larger route designation symbols are used for the U.S. routes to compensate for too many listings on one sign—a subject discussed in NCHRP Report 488, *Additional Investigations on Driver Information Overload*.

² http://www4.trb.org/trb/newshrp.nsf/web/progress_reports?OpenDocument

Roadway Design

Roadway design presents opportunities for research to improve practices and to keep up with changing vehicle characteristics, to increase accommodation for bicycles and pedestrians, to improve safety hardware, and to respond to the demands for context-sensitive solutions. This year, in addition to initiating projects, NCHRP published three reports in the area of roadway design:

- NCHRP Report 502, *Geometric Design Consistency on High-Speed Rural Two-Lane Roadways*, presents rules for consistency in geometric design.
- NCHRP Report 504, *Design Speed and Operating Speed*, uses field data to examine the relationship between design speed and operating speed.
- NCHRP Report 505, *Review of Truck Characteristics as Factors in Roadway Design*, recommends geometric design appropriate to the dimensions and performance characteristics of the current and expected truck fleet.

Pavement Design and Performance

NCHRP is completing a major effort in the field of pavement design, Project 1-37A, Guide for Design of New and Rehabilitated Pavement Structures. The draft guide and software products have undergone review, with the final, revised versions scheduled for release in early 2004, pending review and adoption by AASHTO. The guide assembles the best available knowledge on pavement design in a single, comprehensive package.

Transportation and the Environment

NCHRP Report 481, *Environmental Information Management and Decision Support System—Implementation Handbook*, was published this year. The report details steps that comply with international environmental standards in developing an environmental management and support system to improve decision making on transportation projects, plans, and operations.

Traffic and Operations

Operations are an increasingly high priority, as transportation agencies strive to improve use of the physical plant. The number of research projects in operations and traffic-related topics therefore continues to increase. NCHRP initiated several new projects this year, as well as completing and publishing others:

- NCHRP Report 484, *Feasibility Study for All-White Pavement Marking System*, concludes that



Photographic Driver Study, detailed in NCHRP Report 493, *Evaluation of Traffic Signal Displays for Protected-Permissive Left-Turn Control*, evaluated driver understanding of PPLT signals under various conditions.

an all-white pavement marking system should not be implemented now and recommends improving the yellow-white system; nonetheless, guidelines are included if circumstances dictate all-white markings.

- NCHRP Report 486, *Systemwide Impact of Safety and Traffic Operations Design Decisions for 3R Projects*, develops the Resurfacing Safety Resource Allocation Program, which optimizes resources for systemwide safety improvements under a fixed budget.
- NCHRP Report 488, *Additional Investigations on Driver Information Overload*, presents a model to predict and identify problems with driver information overload and to evaluate alternatives for locating signs.
- NCHRP Report 491, *Crash Experience Warrant for Traffic Signals*, has improved an accident warrant for traffic signals, suitable for use in the *Manual on Uniform Traffic Control Devices*, and provides guidance for estimating the safety impacts of installing or removing traffic signals.
- NCHRP Report 493, *Evaluation of Traffic Signal Displays for Protected-Permissive Left-Turn Control*, recommends traffic signal displays for these types of left turns.

Safety

The first two volumes of NCHRP Report 500, *Guidance for Implementation of the AASHTO Strategic Highway Safety Plan*, were introduced at the National Highway Safety Leadership Forum spon-

sored by AASHTO, U.S. DOT, and other safety organizations, June 2, 2003, in Lexington, Kentucky. Project 17-18(3) plans for 22 volumes, each addressing a specific area of safety. Six volumes were published this year.



Other safety-related publications this year include the following:

- NCHRP Report 490, *In-Service Performance of Barrier Systems*, is a procedures manual for conducting evaluations of in-service barriers.
- NCHRP Report 492, *Roadside Safety Analysis Program (RSAP)—Engineer's Manual*, presents a cost-effective analysis procedure for assessing roadside safety improvements.
- NCHRP Report 501, *Integrated Safety Management Process*, offers a management approach to integrate engineering, education, and enforcement in addressing the causes of major highway-related crashes.

Selected Studies in Transportation Law

An update of the four-volume compendium, *Selected Studies in Highway Law*, is nearing completion and will be retitled *Selected Studies in Transportation Law*, adding two new volumes on transit law. The first highway volume completed and available was *Tort Liability* (CRP-CD-20, Volume 4). *Environmental Law and Transportation* (CRP-CD-20, Volume 3) was published this year.

Continuing Projects

NCHRP supports several continuing projects that include studies both completed and under way:

- Project 20-5, Synthesis of Information Related to Highway Problems, produces state-of-the-practice reports.
- Project 20-6, Legal Problems Arising out of Highway Programs, conducts reviews of case law and publishes results in the *NCHRP Legal Research Digest* series.
- Project 20-30, NCHRP-IDEA, funds projects to demonstrate innovative concepts or products.
- Project 20-36, Highway Research and Technology: International Information Sharing, provides financial support for state DOT representatives to participate in international meetings and to host foreign experts in the United States. The project also shares expenses with FHWA for international scanning tours.

TRANSIT COOPERATIVE RESEARCH PROGRAM

Authorized by the Intermodal Surface Transportation Efficiency Act (ISTEA) and initiated under TRB management in July 1992, TCRP was reauthorized in 1998 under TEA-21 and is supported by annual grants from FTA. The TCRP Oversight and Project Selection (TOPS) Committee selects research for the program; the committee also serves as the board of directors of the Transit Development Corporation (TDC), a nonprofit educational and research affiliate of the American Public Transportation Association (APTA). A three-way memorandum of agreement by FTA, TDC, and TRB outlines the program's operating procedures. In its first 11 years, TCRP has undertaken 370 studies and has completed 315, with 55 in progress.

TCRP receives research problem statements throughout the year and has considered approximately 1,800 since 1992. The first 129 research projects advertised by TCRP attracted a total of 954 proposals from 483 different groups—an average of 7.4 proposals per project. In late 2002, TCRP issued a call for fiscal year 2004 problem statements to more than 4,000 individuals and organizations in the transit community, emphasizing research consistent with FTA's Strategic Goals and Policy Initiatives and the TCRP Strategic Plan. TCRP received and processed 100 problem statements for fiscal year 2004.

TRB submits quarterly progress reports on TCRP to FTA, describing the work accomplished during the quarter and anticipated for the next period. Details of the program's progress since 1992 can be found in the December 2003 TCRP Annual Report.

TCRP panels convened 47 meetings during calendar year 2003, involving approximately 450 professionals and representing more than 650 days of volunteer time. Among these were 23 panel meetings to prepare research problem statements and to select research agencies; 12 interim project meetings to review midcourse project status; and 12 meetings on special projects. TOPS Committee also met twice in 2003. In 2003, TCRP published 37 project reports and 2 web documents. TCRP has produced a total of 299 publications: 108 Reports, 50 Syntheses of Transit Practice, 64 Research Results Digests, 20 Legal Research Digests, 27 IDEA reports, 23 web documents, and 7 stand-alone CD-ROMs.

Research Dissemination

Dissemination of research results is a continuing priority. APTA is responsible for Project J-1: Dissemination and Implementation of Research Findings.

The project's mission, to disseminate TCRP materials directly to people in the transit industry, has expanded to include outreach in many forms, particularly via the Internet and electronic communications. APTA also has expanded its outreach within the industry through the Transit Research Innovation Program (TRIP), managed by the Conference of Minority Transportation Officials; TRIP's volunteer ambassadors reach industry practitioners through personal contact in the field.

APTA also disseminates TCRP information through *Passenger Transport*, the industry's weekly newspaper, and has increased media exposure in the past year through press releases and other means. In addition, APTA solicits research proposals; arranges for workshops, training, and field visits; conducts surveys; announces new reports and program news in *Passenger Transport*; and oversees other activities to ensure that public transportation industry practitioners receive and implement research results. Past initiatives include development of a TCRP Product Dissemination website (www.tcrponline.org); a TCRP publications catalog, distributed at conferences and other forums; a TCRP Rural Publications Catalog, which describes the many rural public transportation-related TCRP projects published or under way; and a transit industry survey to determine the level of awareness, satisfaction, and use of TCRP products.

TRB makes all TCRP-published reports available online through TRB's website.³ Reports are also available online through APTA's TCRP Dissemination website.⁴

The following TCRP activities of particular interest to the transit community were either in progress or completed during the year:

Public Transportation Security

In late 2001, the TOPS Committee allocated \$2 million in funding under TCRP Special Project J-10, Public Transportation Security Research, for security-related research in response to the terrorist attacks of September 11, 2001. The TOPS Committee designated an oversight panel—consisting of the Security Task Force of the APTA Executive Committee and representatives from FTA—to allocate the project funds. Two TCRP technical panels were formed to oversee specific research projects.

To proceed quickly once the technical panels had identified specific research topics, TRB established a

fast-track procurement process, contracting with three research teams. The technical panels met in January 2002 to select research topics and to prepare scopes of work, and the APTA Executive Committee Security Task Force endorsed the projects. Final research topics and scopes then were assigned to the research teams according to the proposals submitted. All 13 initially selected projects have been completed.

In October 2002, the TOPS Committee allocated an additional \$400,000 for public transportation security research. The technical panels met in June 2003 and selected a second round of four research topics: Project J-10C, Guidelines for Conduct of Emergency Training Drills, Simulations, and Exercises; J-10D, Developing and Updating Security Plans: A Pilot Course for Rural and Community-Based Public Transit Systems; J-10E, Comprehensive Security Resources CD-ROM; and J-10F, Transportation Agency Continuity of Operations Plan.

Technical panels have been formed for the projects, and work is under way. NCHRP is providing an equal amount of funding for Projects J-10C and J-10F to provide coordinated, multimodal research.

TCRP Report 86 comprises a series on security-related research. Subsequent research results will be published as additional volumes of TCRP Report 86.

Bus Rapid Transit

TCRP Report 90, *Bus Rapid Transit*, published in two volumes in 2003, is a resource document for applying the concept of bus rapid transit (BRT) service. Volume 1 gathers comprehensive case studies of 26 domestic and international applications of BRT, covering planning and implementation, along with system descriptions, including operations and performance. Volume 2 supplies guidelines for implementation, describing



Bus rapid transit vehicles, the subject of TCRP Report 90, Volume 1, *Bus Rapid Transit: Case Studies in Bus Rapid Transit*, operate primarily in fast and easily identifiable exclusive transitways or dedicated bus lanes.

³ www.trb.org/tcrp

⁴ www.tcrponline.org

the concepts and main components of BRT, including planning, key issues, system development, desirable conditions, and general planning principles, plus an overview of system types.

Improved Customer Information

TCRP Report 92, *Strategies for Improved Traveler Information*, summarizes the state of the practice in providing information to transit travelers. The report identifies transit traveler information needs, assesses the state of the art in providing transit traveler information, offers examples of customer information systems from the transit industry and other related industries, examines transit traveler information as part of community information systems, and looks at new directions for traveler information services.

TCRP Synthesis 48, *Real-Time Bus Arrival Information Systems*, surveys the state of the practice in the United States and abroad. Technical capabilities, agency experience, costs, and bus rider reactions are presented for various information systems, drawing on literature reviews, a survey of transit agencies, and interviews with transit agency personnel, along with detailed case studies of agencies that have deployed the systems.

Commuter Benefits Programs

TCRP Report 87, *Strategies for Increasing the Effectiveness of Commuter Benefits Programs*, is designed to help transportation agencies improve commuter benefits to meet employer needs and to increase participation through marketing. The report explains how commuter benefits work, describes employer characteristics that contribute to program success, presents marketing messages and tactics to promote programs, reviews barriers and ways to overcome barriers, and provides guidance on developing an effective commuter benefits program. The report includes 10 appendixes of legal and technical information on commuter benefits, as well as the results of surveys, interviews, and case studies conducted for the research.

Financing Public Transportation

TCRP Report 89, *Financing Capital Investment: A Primer for the Transit Practitioner*, is a resource for agency personnel involved in financing public transportation capital projects. The primer identifies and evaluates financing options. Although emphasizing approaches that take advantage of access to public capital markets, the document also addresses the tradeoffs of pay-as-you-go approaches versus approaches that borrow against future resources. The



A real-time passenger information display system in the Washington, D.C., Metro, detailed in TCRP Report 92, *Strategies for Improved Traveler Information*, provides actual arrival times of trains, elevator and escalator outages, incident information, and security alerts.

primer includes descriptive sections that outline the basic financing approaches and structures available to transit systems, as well as sections that help system managers and public officials determine when alternative financing is most appropriate.

TCRP Research Results Digest 60, *Characteristics of State Funding for Public Transportation—2002*, presents an overview of the nature and magnitude of state transit funding for 46 states and the District of Columbia during fiscal year 2002 in an easy-to-read, graphical format. Information includes funding sources and amounts, programs, eligible uses and allocation, and state transit funding per capita. The digest also includes results of 28 transit-related state and local ballot initiatives in 2002.

Performance Measurement Programs

TCRP Report 88, *A Guidebook for Developing a Transit Performance-Measurement Program*, provides a step-by-step process for developing a program to measure performance with traditional and nontraditional indicators that address customer and community concerns.

An accompanying CD-ROM includes an electronic version of the guidebook with extensive hyperlinks, allowing users to link to related material and to navigate the performance measure selection menus. The CD-ROM also includes a background document with additional case studies and an annotated bibliography of approximately 200 documents on transit performance measurement, related TCRP titles, and other resources.

Complementing Report 88 is TCRP Research Results Digest 56, *A Summary of TCRP Report 88:*

A Guidebook for Developing a Transit Performance-Measurement System, which provides an executive summary of the contents and tools in the report.

Fare Policies, Structures, and Technologies

TCRP Report 94, *Fare Policies, Structures and Technologies: Update*, identifies, describes, and evaluates fare structures, policies, and technologies under consideration by transit agencies, focusing on the impacts on customers, operations management, and effective and equitable fare integration. The report includes data on fare structures, policy-making procedures, and efforts to implement fare technology.

TCRP Research Results Digest 57, *Developing a Recommended Standard for Automated Fare Collection for Transit: Scoping Study—Regional Fare Management Programs*, provides guidance on how to apply automated fare collection in multiagency, regional environments. The digest assembles a representative sample of regional fare management programs, reviews the structures, and suggests procedures for implementing regional programs. The digest defines a regional fare management program as a system that allows several unaffiliated agencies within a geographic zone to provide a consistent policy of transit fares and instruments to board vehicles operated by various carriers.

Transit Organizations

TCRP Report 97, *Emerging New Paradigms in Public Transportation, Charting Change: A Guide to Fundamental Change in Local Public Transportation Organizations*, focuses on examples of changes that illustrate the evolution of a new organizational paradigm for meeting U.S. regional mobility needs. The report examines the basic themes and principles behind the paradigm shift, drawing on the experiences of businesses and industries within and outside the transportation sector; presents six dimensions of fundamental change in many agencies; contains observations of agency experiences in undergoing fundamental change; and presents an agenda for an examination of fundamental change in the U.S. transit industry.

This report concludes the series produced under TCRP Project J-8B, *New Paradigms for Local Public Transportation Organizations*, joining TCRP Report 53, *Forces and Factors That Require Consideration of New Paradigms*; TCRP Report 58, *Opening the Door to Fundamental Change*; and TCRP Research Results Digest 55, *Support for Fundamental Change in Public Transportation*.

Legal Issues in Transit

TCRP Project J-5, *Legal Aspects of Transit and Intermodal Transportation Programs*, reports on legal issues associated with transit and intermodal law. Each document provides transit attorneys with authoritative, well-researched, specific information on legal issues and problems of national significance to the transit industry.

In 2003, TCRP Legal Research Digest 19, *Impact of the Americans with Disabilities Act on Transit Operations*, was published, summarizing the Americans with Disabilities Act (ADA) and its legislative history, the implementing regulations, the jurisdictions of the federal agencies with ADA oversight functions, and related issues. The digest also contains information about FTA interpretations of the ADA, other ADA-related administrative and judicial case studies, and the ADA requirements affecting employment, infrastructure, and service.

In addition, TCRP CD-ROM 20, *Selected Studies in Transportation Law, Volume 6: Transit Labor 13(c) Decisions*, compiles all 13(c) decisions from the Department of Labor, indexed chronologically by subject and issue.

Several additional legal research publications will be produced in 2004, including *A Compilation of Transit Laws and A Compilation of FTA's Charter Bus Service Decisions*.

Bus Safety

TCRP Synthesis 49, *Yield to Bus—State of the Practice*, documents transit agency experiences with yield-to-bus (YTB) programs in California, Florida, Oregon, Washington, and British Columbia. Agency surveys obtained information on the legislative process and history; the implementation, including public awareness and education campaigns, employee awareness and training, and the design and location of the yield display on the bus; and experience, covering operational and institutional issues, as well as public acceptance. An additional survey reports on bus operator perceptions of YTB programs.

Transit Vehicles and Maintenance

TCRP Project C-14, *Technical Support for Development of Transit Bus Standards*, has established a transit industry-driven process for developing bus standards in a variety of technical areas. Administered by APTA, the process is guided by the APTA Bus and Paratransit CEO Committee's Bus Standards Policy and Planning Subcommittee.

During 2003, several standards were developed for bus brakes, engine cooling systems, and heating,

ventilation, and air conditioning systems. Additional standards continue to be developed in each of these areas, and the subcommittee has selected three other areas for attention—bus operator qualifications and training, on-board bus fire safety, and on-board bus electronic communication integration—and work is under way.

TCRP Synthesis 50, *Use of Rear-Facing Position for Common Wheelchairs on Transit Buses*, describes the state of the practice and issues in the use of a rear-facing position for ADA-defined common wheelchairs on large transit buses. Surveys of Canadian transit systems that have adopted the rear-facing position, case studies, and interviews with experts in other countries were conducted, along with a review of the literature from many sources and countries.

Workforce Development

TCRP Synthesis 47, *Corporate Culture as the Driver of Transit Leadership Practices*, describes how peer agencies are addressing the workforce issues of developing and retaining transit leadership. A literature review, a survey of transit agencies, and a case study provide the framework for examining the role of corporate culture in implementing practices, tech-

niques, and strategies for recruiting and retaining transit leadership.

TCRP Report 96, *Identifying Training for New Technologies: A Decision Game and Facilitation Guide*, introduces an electronic decision game (eDG) to simulate decision making about training for the implementation of new technologies. The eDG is an interactive, experiential, web-based tool for training operations decision makers—as individuals and as collaborative team members—in a realistic, stressful, but simulated environment.

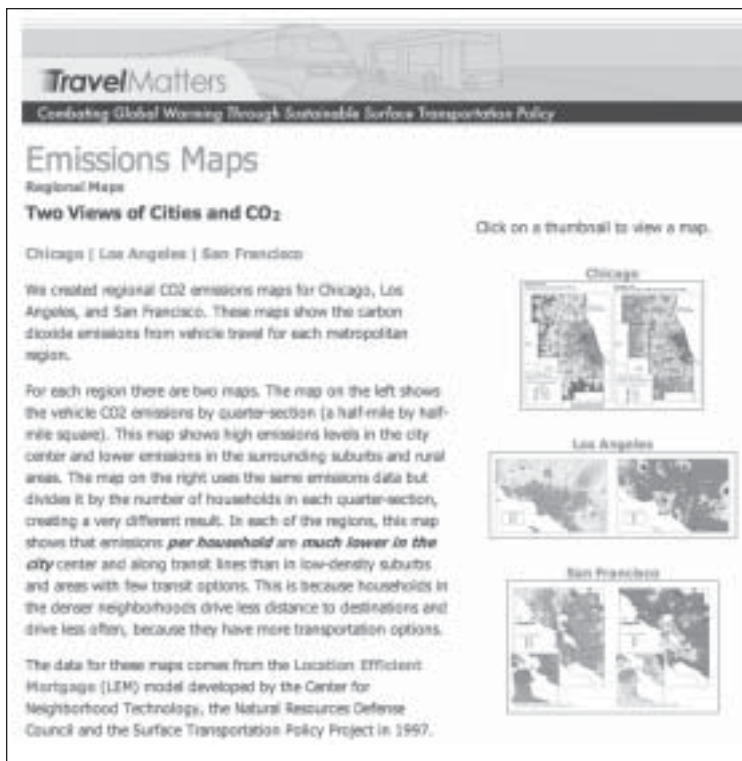
TCRP Project F-11, Positioning the Public Transportation Operating Agency as an Employer of Choice, was completed in late 2003. The report, in publication, offers a toolkit for transportation policy makers and practitioners to implement more effective, barrier-free business-planning processes for human resources.

Planning

TCRP Report 93, *Travel Matters: Mitigating Climate Change with Sustainable Surface Transportation*, and a related website⁵ present information on climate change and examine ways to reduce greenhouse gas emissions from transportation. Both the print and web-based research products review the potential for public transportation to mitigate greenhouse gas emissions, and both present the information in a format accessible to transportation professionals and the general public.

The TravelMatters website includes two online calculators that track greenhouse gas emissions for individuals or transit fleets and a series of geographic information systems maps illustrating the correlations between land use, automobile use, and carbon dioxide emissions. Both the print and website products present information on how land use can generate travel demand; how transit agencies can modify operating systems to maximize ridership; and the potential emissions benefits of alternative, low-emissions technologies.

TCRP Report 95, *Traveler Response to Transportation Systems Changes: Third Edition*, will comprise 19 volumes, serving as a sourcebook for the ways that transportation system changes and the built environment affect travel demand. The first four volumes were published this year, addressing transit information and promotion, road value pricing, land use and site design, and parking management and supply. The remaining volumes will be published in 2004.



Portion of the interactive TravelMatters website, developed under TCRP Project H-21, Combating Global Warming Through Sustainable Surface Transportation Policy.

⁵ www.TravelMatters.org

TCRP Report 100, *Transit Capacity and Quality of Service Manual: Second Edition*, is expected to become the transit counterpart to TRB's mainstay *Highway Capacity Manual*. The report is a fundamental reference document for public transportation practitioners, featuring quantitative techniques for calculating the capacity of bus, rail, and ferry services, and transit stops, stations, and terminals. The manual also provides a framework for measuring transit availability and quality from the passenger point of view.

Coordination of Human Service Transportation and Transit Services

TCRP Report 91, *Economic Benefits of Coordinating Human Service Transportation and Transit Services*, examines the economic benefits of various strategies and practices for coordinating human service transportation and general public transit, provides quantitative estimates, and identifies innovative and promising strategies and practices. An executive summary presents basic concepts and strategies to achieve economic benefits from coordinating operations. The information is intended for federal, state, and local officials developing strategies and policies for coordinating transportation resources.

Track Design

TCRP Report 71, Volume 2, *Transit Switch Design (Phase I)* describes a new switch design concept, developed and tested by computer, that promises improved and longer-lasting performance. A prototype of the switch is being manufactured and field tested under TCRP Project D-7, Joint Rail Transit-Related Research, with the Association of American Railroads Transportation Technology Center, Inc. (TTCI). The project uses TCRP funds to supplement and leverage research at TTCI for FRA and freight railroads to benefit the transit industry. TCRP publishes the results of the joint research. The project also includes other research efforts.

e-Transit: Electronic Business Strategies for Transit

TCRP Report 84 is a multipart series on electronic business strategies for public transit—designated as e-transit. The objective is to bring electronic business strategies to public transportation and mobility management. In 2003, two new volumes of Report 84 were published: Volume 3, *Using the Internet for Transit Training and Certification*; and Volume 4, *Advanced Features of Transit Websites*. Volume 3

presents the results of an investigation into web-based training to provide effective, high-quality programs for the transit industry. Volume 4 explores the potential of advanced website features such as automated itinerary planners, real-time customer information, e-mail notification systems, and customer relationship management.



Lessons from Abroad

Since 1994, TCRP has sponsored 19 leadership-development missions under TCRP Project J-3, International Transit Studies Program. Through 2003, approximately 250 transit professionals have participated in missions to Europe, Asia, Canada, South America, New Zealand, and Australia. The goal is to expand the horizons of U.S. transit managers, encouraging a mobility manager approach to delivering transit services. More than a dozen TCRP Research Results Digests assemble the findings and observations of the participants.

COMMERCIAL TRUCK AND BUS SAFETY SYNTHESIS PROGRAM

The Commercial Truck and Bus Safety Synthesis Program (CTBSSP) is a new cooperative research program sponsored by the Federal Motor Carrier Safety Administration (FMCSA) and administered by TRB. The program was authorized in late 2001 to support FMCSA's safety research programs, with the expectation that approximately \$400,000 would be provided annually by FMCSA for the program.



The program initiates three to four synthesis studies annually to address concerns in commercial truck and bus safety. A synthesis report summarizes current practice in a specific technical area, typically from a literature search and a survey of relevant organizations (e.g., state DOTs, enforcement agencies, commercial truck and bus companies, or other organizations appropriate for the specific topic). The program is modeled after the successful synthesis programs of NCHRP and TCRP. The primary users of the syntheses are practitioners who work on issues or problems with diverse approaches in a variety of settings.

A program oversight panel monitors CTBSSP and its procedures; selects annual synthesis topics after an industry-wide solicitation; refines synthesis

scopes; selects researchers to prepare each synthesis; reviews products; and makes publication recommendations. The program oversight panel has authorized nine synthesis topics:

- CTBSSP 1, *Effective Commercial Truck and Bus Safety Management Techniques*;
- CTBSSP 2, *Security Measures in the Commercial Trucking and Bus Industries*;
- CTBSSP 3, *Highway–Heavy Vehicle Interaction*;
- CTBSSP 4, *Individual Differences and the “High-Risk” Commercial Driver: Implications for Carrier Human Resource Management*;
- CTBSSP 5, *Training of Commercial Motor Vehicle Drivers: Best Practices*;
- CTBSSP 6, *Effective Motorcoach Industry Hours of Service and Fatigue Management Techniques*;
- CTBSSP 7, *Operational Differences/Similarities Between the Motorcoach, School Bus, and Trucking Industries*;

- CTBSSP 8, *Alternative Commercial Truck and Bus Inspection Strategies*; and
- CTBSSP 9, *Technology Utilization in Commercial Truck and Bus Safety Strategies*.

The first three syntheses, initiated in mid-2002, were published in June 2003. Syntheses 4 through 7 are under way, and Syntheses 8 and 9 await additional funding.

STAFF NEWS

Cynthia Butler, Administrative Assistant to Division Director Robert Reilly, received an Individual Distinguished Service Award from the National Academies, citing her as “an outstanding team leader who elevates the performance of others by her example.”

SPECIAL PROGRAMS

The TRB Special Programs Division administers short-term investigations of innovative concepts and advises the federal government on the conduct of long-term research studies.

The division's Innovations Deserving Exploratory Analysis (IDEA) programs foster new and unconventional approaches to advancing transportation practice in transit, highway, high-speed rail, intelligent transportation systems, and transportation safety.

Supported by the division, committees of experts in various aspects of highway technology monitor and advise the Federal Highway Administration (FHWA) of the U.S. Department of Transportation on its continuing operation of the Long-Term Pavement Performance (LTPP) studies, on the continued development and deployment of the Superpave® system of hot-mix asphalt materials mixture design, and on a long-term research program to improve the use of portland cement concrete in highway pavements.

The division also supports a committee of analysts from the United States and abroad that convenes twice each year for informal, critical discussion of ongoing analytical research involving LTPP and other pavement performance data.

IDEA PROGRAMS

IDEA programs fund the initial investigations of concepts that have potential for breakthroughs in transportation technology. Small, researcher-initiated



Victor M. Mendez
Chair
Long-Term Pavement
Performance Committee



William J. Harris, Jr.
Chair
Committee for the
High-Speed Rail
IDEA Program



Joseph A. Mickes
Chair
TRB Superpave®
Committee



Joseph T. Deneault
Chair
Committee for Research
on Improved Concrete
Pavement for
Federal-Aid Highways



Ray Pethel
Chair
Transportation Safety
Technology IDEA
Committee



Neil F. Hawks
Director
Special Programs



The 2-mile Smart Road in Blacksburg, Virginia, is a state-of-the-art facility for pavement research and evaluation of intelligent transportation systems technologies and is described in the Spring/Summer 2003 issue of *Ignition* published by the Special Programs Division.

projects investigate the feasibility of innovative concepts in general areas of interest to the transportation community. 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.

The Safety IDEA program has expanded its support and its scope since its establishment in 2001 under the sponsorship of the Federal Motor Carrier Safety Administration. With the addition of the Federal Railroad Administration (FRA) as a sponsor in 2002, the Safety IDEA program now funds projects to improve the safety of truck, intercity bus, and rail operations. By the end of September 2003, the Safety IDEA program committee had selected four research projects for funding, and those investigations are under way.

The state departments of transportation (DOTs) collectively fund highway-related research through the National Cooperative Highway Research Program (NCHRP), which in turn supports the NCHRP IDEA Program. Research on innovations applicable to transit practice is carried out under the Transit IDEA program, funded by the Federal Transit Administration through the Transit Cooperative Research Program. FRA sponsors the High-Speed Rail IDEA program, which focuses on upgrading high-speed rail technology to support FRA's Next-Generation High-Speed Rail Program.

Administration of each program is similar, with necessary adaptations for sponsorship arrangements and target audiences. Each program operates through a committee or panel of volunteer transportation experts who solicit, review, and select research proposals that merit contracts.

Because IDEA projects are high-risk investigations of unproved concepts, funds awarded for any one project are usually less than \$100,000. Frequently, however, IDEA funds are augmented through cost-share arrangements, nearly doubling the amount of research that can be supported through the IDEA programs. Projects active in 2002 received \$3.3 million in cost-share funds to augment the \$4.4 million awarded by the program committees.

A 2003 survey of investigators on the 206 completed IDEA contracts revealed that research and development work had continued on nearly half of the projects, supported by an additional \$20 million in follow-on funding from other sources. Twenty-nine projects have yielded products currently available to the transportation community and another 51 proven concepts are in various stages of development.

An annual summary of completed and current projects is published for each of the IDEA programs and distributed at the TRB Annual Meeting. These summaries are also available on the IDEA page of the TRB website, along with the IDEA Program Announcement, which contains forms and guidelines for submitting proposals.

A quarterly publication, *Ignition*, features interviews with IDEA investigators and transportation leaders, along with highlights of promising projects. Issues of *Ignition* are archived on the IDEA website.¹

RESEARCH PROGRAM COMMITTEES

The Transportation Equity Act for the 21st Century (TEA-21) led directly to the creation of two new continuing research program committees in the Special Programs Division and to an expanded role for the TRB LTPP Committee. All three committees monitor, review, and advise on the conduct of pavement research and technology programs.

Long-Term Pavement Performance

The goal of LTPP is to discover, through a series of rigorous, long-term field experiments on in-service highways, the physical relationships that determine the long-term performance of highway pavements. The TRB LTPP Committee, assisted by specialized expert task groups, provides general guidance and technical oversight during the projected 20-year span of the studies.

The committee counsels FHWA and the American Association of State Highway and Transportation Officials (AASHTO) on the continuing collection of

¹ www.TRB.org/idea

pavement performance data, on analyses of the data, and on a product development program to convert LTPP findings into engineering products.² The Expert Task Group on LTPP Data Analysis provides peer review of analytical research initiatives; the committee makes recommendations to direct the analytical research toward practical products and has developed a long-term plan to set priorities for research projects. In 2003, LTPP began three new data analysis contracts.

Other TRB expert task groups monitor LTPP operations, including the collection of traffic, distress and profile, and materials data. Expert task groups are created as technical issues arise in the LTPP studies. A new ETG on the Management of the LTPP Database was created in 2002.

Another Special Projects Division group uses a less formal approach to encourage and facilitate use of LTPP and similar data. The Data Analysis Working Group provides an international forum for researchers to discuss pavement performance data analysis projects and exchange new techniques for analyzing the data. At these informal forums, researchers relate experiences on active analytical projects. At the conclusion of each presentation, the speaker, in addition to answering questions from the audience, asks for suggested ways to overcome barriers or for alternative approaches to the analysis. The international group met in January 2003 as part of the TRB Annual Meeting and in Guimarães, Portugal, in association with the 3rd International Symposium on Maintenance and Rehabilitation of Pavements and Technological Control.

Superpave

The Superpave deployment program is jointly funded and managed by FHWA and AASHTO (through NCHRP). The TRB Superpave Committee, organized at the request of AASHTO and FHWA, monitors implementation, recommends annual work programs, and provides a forum for industry and academia to participate in the deployment and further development of the Superpave system.

Assisted by expert task groups on mixtures, aggregates and binders, and on communications, the committee advises the AASHTO Standing Committee on Research about potential Superpave-related research and development projects to be funded through NCHRP, and monitors the progress of the Superpave research and development conducted by FHWA. Since its first meeting in March 1999, the committee

has issued 10 advisory letter reports³ and has developed a long-range plan to bring Superpave development and deployment to a logical conclusion.

In 2003, the committee sponsored activities at The World of Asphalt in Nashville, Tennessee, and at the 8th International Low-Volume Roads Conference in Reno, Nevada, to advance the deployment of Superpave technologies among county and municipal transportation agencies.

Improved Concrete Pavements

TEA-21 provided for a new research program to improve the use of portland cement concrete pavements for federal-aid highways. FHWA, which manages the research effort, requested that TRB organize a committee to coordinate and review the program, and to provide a forum for balanced input from the states, academia, and industry.

The committee, which met in March and October, is advising FHWA on the development of a long-range plan to guide concrete pavement research and on communication strategies to make program findings accessible to the transportation community. The committee has issued nine letter reports with recommendations.⁴ The letter reports—along with letter reports by the TRB Superpave and LTPP committees—are available on the TRB website.

STAFF NEWS

David Jones, PhD, Technical Specialist in Infrastructure Engineering with Transportek, a division of the Council for Scientific and Industrial Research, Pretoria, South Africa, joined the Special Programs Division in June as a visiting researcher for one year. Active on TRB committees, Jones is working with the LTPP Studies to research the benefits and risks of accelerated pavement loading techniques to supplement or complement the full-scale field studies in progress. Additional tasks will include technical research issues related to materials testing, traffic loading, pavement distress, and data analysis.

Jones is the seventh visiting researcher to supplement the Special Programs Division staff in the past 10 years. The visitors—on sabbatical or loan from governmental or academic institutions—provide the division's committees with expert assistance on specific issues.

² http://www4.trb.org/trb/dive.nsf/web/ltppl_letter_reports_3

³ http://www4.trb.org/trb/dive.nsf/web/Superpave_Final_Letter_Reports

⁴ http://www4.nas.edu/trb/dive.nsf/web/reports_of_the_ricp_committee?OpenDocument



Michael P. LaPlante
Director
Administration and
Finance



The TRB Administration and Finance Division provides financial, technology, and administrative support for TRB staff; financial oversight of the contracts and grants that support the work of TRB; expenditure controls; administration for the sales and distribution of publications; 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 is charged with the management of contracts and grants that support TRB's research work; the preparation of budgets for continuing operations and individual projects; and controlling expenditures. TRB's total annual income and expenditures have increased consistently over the years to more than \$50 million. A statement of income and expenditures is provided on pages 44–45.

AFFILIATE AND SPONSOR SERVICES

There are five main levels of support for TRB's core technical activities: 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 elected.

Individual and student affiliate benefits include reduced registration fees for the TRB Annual Meeting, a complimentary subscription to *TR News*, discounts on most TRB books and reports, 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 reduced cost 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 same benefits received by individuals, organizational affiliates receive most publications at no cost and complimentary registrations at the TRB Annual Meeting. Contributions for organizational affiliates range from \$2,000 to \$6,000, depending on the level of benefits elected.

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

Sponsors are the major source of financial support for TRB's core technical activities. Federal, state, and local government agencies and professional societies and organizations representing industry groups are eligible to be TRB sponsors. Fees and services are negotiated with each sponsor to serve the sponsor's particular needs and to provide fundamental support for the Board's programs and activities of interest to the entire transportation community. The minimum annual sponsor fee is \$60,000. Each sponsor also has a representative on the TRB Executive Committee. (See pages 51–52 for a list of TRB sponsors and sustaining affiliates.)

WEB AND STRATEGIC APPLICATIONS

The TRB website has been upgraded. The redesigned version that debuted this year at www.TRB.org offers new functions, a well-organized look, and increased user-friendliness, making it easier for visitors to gather transportation news and information:

- Search engine options include the ability to scan all recent publications by topic and to perform a full-text search of all TRB publications, the Research in Progress database, the TRB online directory, or the whole TRB website.
- The homepage now displays the top headlines from the TRB E-Newsletter. Visitors have ready access to all the transportation news sent out weekly.¹ The news items are fully searchable, reporting on TRB, as well as presenting transportation information from around the country and from international sources.

¹ To subscribe, send an e-mail to RHouston@nas.edu with "TRB E-Newsletter" in the subject field.

- Navigation of the site is easier, with links to categories of programs, activities, and resources along the left border of the homepage. The new layout enables one-click access to TRB's most popular tools and resources.
- Direct links to the TRB online bookstore facilitate the purchase of publications. The homepage and other screens throughout the website display links to PDF documents available free online and to publications available for sale. The website allows users to view many documents online and to search, browse, and read publications before purchasing online.

PUBLICATION SALES AND DISTRIBUTION

TRB's timely distribution of publications disseminates transportation research and technology results worldwide. The Board continues to expand its publishing efforts by releasing selected publications in electronic format, some exclusively.

TRB also distributes and maintains an inventory of publications and videotapes that report on the results of research supported by the Strategic Highway Research Program (SHRP). The full collection of SHRP reports is available in electronic format on the TRB website.

A complete listing of publications issued from January 1, 2003, through December 31, 2003, appears on pages 47–50.

STAFF NEWS

- The National Academies presented a Group Distinguished Service Award for 2003 to the TRB Information Technology Unit: Strategic Technology Development Manager **Stewart Gosney**, Web and Technology Analyst **Derek Hyde**, and Programmer Analyst **Jeff Isenhour** of the Administration and Finance Division, and Information Specialist **Gordon Franke** of the Technical Activities Division. The award cited "strong teamwork in creating TRB-wide applications ... to provide an array of high-quality services to ... [TRB] constituents and customers," such as the web-based paper submission, review, and revision system; the interactive, online Annual Meeting Program; the online directory of TRB committees, panels, and volunteers; and maintenance and enhancement of the Transportation Research Information Services database.
- **Rolanda Wilson** joined the TRB Business Office in March 2003 as Publication Sales Assistant.

STATEMENT OF INCOME AND EXPENDITURES

Calendar Years 2002 and 2003

	CY 2002 (actuals)	CY 2003 (projected) ^a
Sources of Income		
Core Technical Activities, Special Continuing Programs, and Studies/Conferences/Workshops		
State Transportation Departments	\$6,626,685	\$6,060,000
Federal Highway Administration	4,549,996	4,045,000
Bureau of Transportation Statistics	828,393	855,000
National Highway Traffic Safety Administration	460,944	405,000
Federal Motor Carrier Safety Administration	424,381	720,000
Research and Special Programs Administration	360,836	460,000
U.S. Coast Guard	303,613	230,000
Federal Aviation Administration	287,493	200,000
Federal Transit Administration	272,189	300,000
Federal Railroad Administration	167,784	295,000
National Aeronautics and Space Administration	111,432	60,000
U.S. Army Corps of Engineers	103,341	110,000
Department of Navy	102,816	25,000
Environmental Protection Agency	85,000	60,000
U.S. Department of Energy	72,282	85,000
American Public Transportation Association	60,000	60,000
Association of American Railroads	60,000	60,000
National Asphalt Pavement Association	60,000	0
American Transportation Research Institute	60,000	60,000
U.S. General Accounting Office	55,713	0
Robert Wood Johnson Foundation	38,812	235,000
Bureau of Indian Affairs	23,849	0
The UPS Foundation	19,840	10,000
USDA Forrest Service	17,772	40,000
Oak Ridge National Laboratory	16,471	10,000
Maritime Administration	11,297	25,000
Metropolitan Washington Council of Governments	0	115,000
U.S. Department of Agriculture	0	20,000
The National Academies	184,657	70,000
Miscellaneous	310,711	150,000
Affiliate, registration, royalties, and publication sales	1,889,235	1,900,000
Subtotal	\$17,565,542	\$16,665,000
Cooperative Research Programs		
State Transportation Departments	\$27,473,517	\$26,000,000
Federal Highway Administration	764,354	1,990,000
Federal Transit Administration	8,091,708	8,250,000
Publication Sales	60,716	50,000
Subtotal	\$36,390,295	\$36,290,000
Total TRB Income		
State	\$34,100,202	\$32,060,000
Federal	17,095,193	18,175,000
Other	2,760,442	2,720,000
Total	\$53,955,837	\$52,955,000
Expenditures by Major Cost Category		
Salaries (including fringe benefits)	\$8,855,675	\$8,723,000
Travel and Meetings	4,425,586	4,359,300
Consultants and Contracts	25,414,827	25,034,000
Abstracting, Indexing, Publishing	2,494,994	2,457,600
Other Direct Costs	1,679,423	1,654,300
Indirect Costs	10,610,732	10,451,800
Subtotal	\$53,481,237	\$52,680,000
Total TRB Expenditures		
State	\$34,100,202	\$32,060,000
Federal	17,095,193	18,175,000
Other	2,285,842	2,445,000
Total	\$53,481,237	\$52,680,000

	CY 2002 (actuals)	CY 2003 (projected) ^a
Expenditures by Major Activity		
Core Technical Activities		
Field Visits and Committee Activities	\$5,455,014	\$5,279,200
Annual Meeting	1,282,794	1,241,500
Library and Transportation Research Information Services (TRIS)	1,342,864	1,299,600
Publications	2,665,639	2,579,700
Subtotal	\$10,746,311	\$10,400,000
Special Continuing Programs		
Pavement Program Review Committees and Activities	\$1,037,859	\$900,000
Innovations Deserving Exploratory Analysis (IDEA)	2,302,297	1,900,000
Synthesis Studies	1,430,667	1,800,000
Legal Studies	438,021	400,000
Research and Technology Coordinating Committee	197,039	400,000
Marine Board Core Program	126,733	190,000
Subtotal	\$5,532,616	\$5,590,000
Studies/Conferences/Workshops	\$4,915,059	\$4,810,000
Cooperative Research Programs		
National Cooperative Research Program		
Technical Direction, Reports and Panels	\$5,369,862	\$5,398,500
Research	19,636,644	19,741,500
Subtotal	\$25,006,506	\$25,140,000
Transit Cooperative Research Program		
Technical Direction, Reports and Panels	\$2,531,430	\$2,326,600
Research	4,801,898	4,413,400
Subtotal	\$7,333,328	\$6,740,000
Subtotal ^b	\$32,339,834	\$31,880,000
Total Expenditures by Major Activity		
State	\$34,100,202	\$32,060,000
Federal	17,095,193	18,175,000
Other	2,285,042	2,445,000
	\$53,481,237	\$52,680,000

SPECIAL FUND

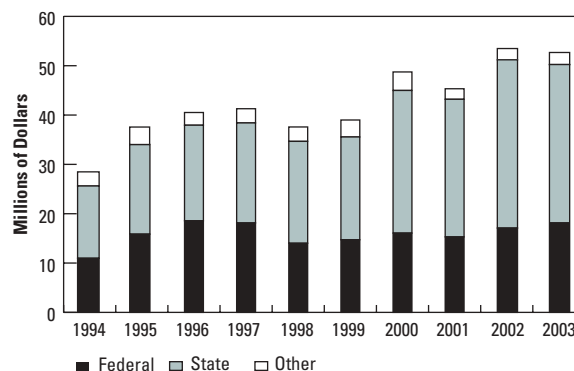
Fund balance, end of previous fiscal year	\$5,265,550	\$5,740,150
Plus (minus) current fiscal year income over (under) expenditures	474,600	275,000
Balance, current fiscal year	\$5,740,150	\$6,015,150

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.

^a CY 2003 data use actual income and expenditures for the first 3 quarters and an estimate for the 4th quarter.

^b The total expenditure shown for the Cooperative Research Programs (CRP) is lower than the total revenue shown for the CRP because some expenditures are included in CRP-supported activities under TRB's Special Continuing Activities and Studies/Conferences/Workshops.

TRB Expenditures per Year



TRB CONFERENCES AND WORKSHOPS

January 1, 2003–December 31, 2003

JANUARY

- 11 Data Analysis Working Group (DAWG) Forum on Pavement Performance Data Analysis
- 12–16 TRB 82nd Annual Meeting

MARCH

- 17–19 Asphalt Pavement Conference: Superpave 2003*

APRIL

- 3–4 Research and Technology Coordinating Committee Symposium on Highway Research and Technology
- 6–10 9th Conference on Application of Transportation Planning Methods
- 8–10 Community Impact Assessment: Connecting with People Today for a Well-Designed Tomorrow
- 28–30 9th International Bridge Management Conference

MAY

- 4–6 CEO Leadership Forum
- 5 Optimizing the Dissemination and Implementation of Research Results
- 18–21 Statewide Transportation Planning Conference

JUNE

- 22–25 8th International Conference on Low-Volume Roads

JULY

- 6–9 Noise and Vibration Conference
- 11 DAWG Forum on Pavement Performance Data Analysis
- 13–15 28th Annual Summer Ports, Waterways, Freight, and International Trade Conference
- 13–17 10th AASHTO–TRB Maintenance Management Conference*
- 14–17 Environmental Analysis in Transportation and Landscape and Environmental Design Joint Midyear Committee Meeting

- 15–18 Joint Summer Meeting of the Planning, Economics, Finance, Freight, and Management Committees
- 20–23 42nd Annual Workshop on Transportation Law
- 27–30 2nd Urban Street Symposium

AUGUST

- 5–6 Marine Salvage Workshop
- 24–25 Urban and Community Transit: The Role for Automated Bus Rapid Transit
- 24–29 International Conference on Ecology and Transportation*

SEPTEMBER

- 8–10 International Conference on Highway Pavement Performance, Data Analysis, and Design Applications*
- 9–12 Community Impact Assessment: Putting It All in Context*
- 17–19 10th National Highway–Utility Conference*
- 23 Symposium on Performance of Rock Anchors
- 29–30 5th National Conference on Asset Management: Moving from Theory to Practice (Atlanta, Georgia)*

OCTOBER

- 8–10 Driving Simulation Conference: North America 2003*
- 21–22 Safety-Conscious Planning Leadership Conference II
- 21–22 5th National Conference on Asset Management: Moving from Theory to Practice (Seattle, Washington)*

NOVEMBER

- 12–15 6th Rail Passenger Caucus
- 16–18 9th National Light Rail Transit Conference
- 17–20 Joint Ventures: Partners for Stewardship*
- 19–22 International Symposium on Road Pricing

* TRB participates in meeting as a cosponsor.

TRB PUBLICATIONS

Transportation Research Record: Journal of the Transportation Research Board

- 1819 Eighth International Conference on Low-Volume Roads 2003 (2 Volume Set)
- 1820 Water Transportation, Ports, and International Trade
- 1821 Geology and Properties of Earth Materials 2003
- 1822 Transportation Security and Infrastructure Protection
- 1823 Pavement Rehabilitation and Accelerated Testing 2003
- 1824 Highway Maintenance Safety, Support, and Services
- 1825 Railroad Research: Intercity Passenger Transportation, Track Design and Maintenance, and Hazardous Materials Transport
- 1826 Intelligent Transportation Systems and Vehicle-Highway Automation 2003
- 1827 Highway Pavements and Structures Maintenance and Security
- 1828 Pedestrians and Bicycles 2003
- 1829 Bituminous Binders 2003
- 1830 Highway Safety, Traffic Law Enforcement, and Truck Safety
- 1831 Travel Demand and Land Use 2003
- 1832 Bituminous Paving Mixtures 2003
- 1833 Freight Transportation 2003
- 1834 Concrete 2003
- 1835 Transit: Planning and Development, Management and Performance, Marketing and Fare Policy, and Intermodal Transfer Facilities
- 1836 Research Initiatives in Information Technology and Geospatial Science for Transportation
- 1837 Geomaterials 2003
- 1838 Transit Rail Transit, Commuter Rail, Light Rail Transit, New Technology, and Maintenance
- 1839 Transportation Finance, Economics, and Economic Development 2003
- 1840 Statistical Methods and Modeling and Safety Data, Analysis, and Evaluation
- 1841 Transit Buses, Paratransit, Rural Public and Intercity Bus, New Transportation Systems and Technology, Capacity and Quality of Service
- 1842 Energy, Air Quality, and Fuels 2003
- 1843 Human Performance, Simulation, User Information Systems, and Older Person Safety and Mobility
- 1844 Traffic Control Devices, Visibility, and Rail-Highway Grade Crossings 2003
- 1845 Design of Structures 2003
- 1846 Transportation in Developing Countries
- 1847 Operational Effects of Geometrics 2003
- 1848 Transportation Management and Public Policy 2003
- 1849 Soil Mechanics
- 1850 Air Transportation Challenges: Airspace, Airports, and Access
- 1851 Highway and Facility Design 2003
- 1852 Traffic Flow Theory and Highway Capacity 2003
- 1853 Pavement Management and Rigid and Flexible Pavement Design 2003
- 1854 Traveler Behavior and Values 2003
- 1855 Transportation Data Research
- 1856 Freeways, HOV, and Traffic Signal Systems 2003
- 1857 Transportation Network Modeling 2003
- 1858 Transportation Planning and Analysis 2003
- 1859 Sustainability and Environmental Concerns in Transportation
- 1860 Pavement Assessment, Monitoring, and Evaluation 2003
- 1861 Construction 2003

Special Reports¹

- 272 Airport Research Needs: Cooperative Solutions
- 273 Shipboard Automatic Identification System Displays: Meeting the Needs of Mariners
- 274 Cybersecurity of Freight Information Systems: A Scoping Study
- 275 The Workforce Challenge: Recruiting, Training, and Retaining Qualified Workers for Transportation and Transit Agencies
- 276 A Concept for a National Freight Data Program
- 277 Measuring Personal Travel and Goods Movement: A Review of the Bureau of Transportation Statistics' Surveys
- 278 Buckling Up: Technologies to Increase Seat Belt Use

Miscellaneous Publications

- Access Management Manual with CD-ROM
- Moisture Sensitivity of Asphalt Pavements: A National Seminar
- Transportation, Energy, and Environmental Policy: Managing Transitions—VIII Biennial Asilomar Conference, September 2001

Conference Proceedings¹

- 29 Remote Sensing for Transportation Products and Results: Fundraising for the Future

Transportation Research Circulars (online)

- 48 Freight Transportation Research Needs Statements
- 49 9th International Bridge Management Conference
- 50 Transportation and Economic Development 2002
- 51 Future Aviation Activities: 12th International Workshop
- 52 Maintenance Management 2003: Presentations from the 10th AASHTO-TRB Maintenance Management Conference
- 53 9th International Bridge Management Conference: Supplement
- 54 Third National Community Impact Assessment Conference: Community Impact Assessment in the 21st Century: Making Connections and Building Relationships

55	National Forum on Assessing Historic Significance for Transportation Programs		Volume 4: A Guide for Addressing Head-On Collisions
56	The Future of MEMS: Microelectromechanical Systems in Transportation Engineering		Volume 5: A Guide for Addressing Unsignalized Intersection Collisions
57	The Roadway INFOstructure: What? Why? How?		Volume 6: A Guide for Addressing Run-Off-Road Collisions
58	9th Annual Light Rail Transit Conference		
59	Accelerated Highway Construction: Workshop Series Summary	501	Integrated Safety Management Process
60	Using Simulation to Evaluate Impacts of Airport Security	502	Geometric Design Consistency on High-Speed Rural Two-Lane Roadways
61	Data Partnerships: Making Connections for Effective Transportation Planning	503	Application of Fiber Reinforced Polymer Composites to the Highway Infrastructure
		504	Design Speed, Operating Speed, and Posted Speed Practices (with CD-ROM)
		505	Review of Truck Characteristics as Factors in Roadway Design
		506	Quality and Accuracy of Positional Data in Transportation (with CD-ROM)
		508	Accelerated Laboratory Rutting Tests: Evaluation of the Asphalt Pavement Analyzer
		510	Interim Planning for a Future SHRP
		513	Simple Performance Tester for Superpave Mix Design
TR News			
Nos. 224–229			
Online Newsletters			
Intercity Rail Passenger Systems Update, No. 9			
LRT News, Vol. 18, Nos. 1–2			
TRB Transportation Research Electronic Newsletter			
National Cooperative Highway Research Program (NCHRP) Reports²			
481	Environmental Information Management and Decision Support System—Implementation Handbook	307	Systems Engineering Processes for Developing Traffic Signal Systems
483	Bridge Life-Cycle Cost Analysis (with CD-ROM)	309	Transportation Planning and Management for Special Events
484	Feasibility Study for an All-White Pavement Marking System	310	Impact of Red Light Camera Enforcement on Crash Experience
485	Bridge Software—Validation Guidelines and Examples (with CD-ROM)	311	Performance Measures of Operational Effectiveness for Highway Segments and Systems
486	Systemwide Impact of Safety and Traffic Operations Design Decisions for 3R Projects (with CD-ROM)	312	Facilitating Partnerships in Transportation Research
487	Using Customer Needs to Drive Transportation Decisions	313	State DOT Outsourcing and Private-Sector Utilization
488	Additional Investigations on Driver Information Overload (with CRP-CD-36)	314	Strategies for Managing Increasing Truck Traffic
489	Design of Highway Bridges for Extreme Events (with CD-ROM)	315	Compensation for Contractors' Home Office Overhead
490	In-Service Performance of Barrier Systems	316	Design Exception Practices
491	Crash Experience Warrant for Traffic Signals	317	Dealing with Truck Parking Demands
492	Roadside Safety Analysis Program (RSAP)—Engineer's Manual (with CD-ROM)	318	Safe and Quick Clearance of Traffic Incidents
493	Evaluation of Traffic Signal Displays for Protected-Permissive Left-Turn Control	319	Bridge Deck Joint Performance
494	Structural Supports for Highway Signs, Luminaires, and Traffic Signals	320	Integrating Freight Facilities and Operations with Community Goals
495	Effect of Truck Weight on Bridge Network Costs (with CD-ROM)	321	Roadway Safety Tools for Local Agencies
496	Prestress Losses in Pretensioned High-Strength Concrete Bridge Girders	322	Safety Management Systems
497	Financing and Improving Land Access to U.S. Intermodal Cargo Hubs	323	Recruiting and Retaining Individuals in Transportation Agencies
498	Illumination Guidelines for Nighttime Highway Work	324	Prefabricated Bridge Elements and Systems to Limit Traffic Disruption During Construction
499	Effects of Subsurface Drainage on Performance of Asphalt & Concrete Pavements	325	Significant Findings from Full-Scale/Accelerated Pavement Testing
500	Guidance for Implementation of the AASHTO Strategic Highway Safety Plan		
	Volume 1: A Guide for Addressing Aggressive-Driving Collisions		
	Volume 2: A Guide for Addressing Collisions Involving Unlicensed Drivers and Drivers with Suspended or Revoked Licenses		
	Volume 3: A Guide for Addressing Collisions with Trees in Hazardous Locations		
			NCHRP Synthesis of Highway Practice²
			307 Systems Engineering Processes for Developing Traffic Signal Systems
			309 Transportation Planning and Management for Special Events
			310 Impact of Red Light Camera Enforcement on Crash Experience
			311 Performance Measures of Operational Effectiveness for Highway Segments and Systems
			312 Facilitating Partnerships in Transportation Research
			313 State DOT Outsourcing and Private-Sector Utilization
			314 Strategies for Managing Increasing Truck Traffic
			315 Compensation for Contractors' Home Office Overhead
			316 Design Exception Practices
			317 Dealing with Truck Parking Demands
			318 Safe and Quick Clearance of Traffic Incidents
			319 Bridge Deck Joint Performance
			320 Integrating Freight Facilities and Operations with Community Goals
			321 Roadway Safety Tools for Local Agencies
			322 Safety Management Systems
			323 Recruiting and Retaining Individuals in Transportation Agencies
			324 Prefabricated Bridge Elements and Systems to Limit Traffic Disruption During Construction
			325 Significant Findings from Full-Scale/Accelerated Pavement Testing
			NCHRP Research Results Digests²
		272	A Process for Selecting Strategies for Rehabilitation of Rigid Pavements
		273	Development of an Improved Roadside Barrier System—Phase I
		274	Quality Assurance of Structural Materials
		275	Application of European 2+1 Roadway Designs
		276	Strategic Plan for Pavement Research
		277	Review and Improvement of Existing Processes and Procedures for Evaluating Cultural Resource Significance

- 278 Accessible Pedestrian Signals: Synthesis and Guide to Best Practice
- 279 Making the Business Case for Translating Non-English Transportation Information
- 280 Continuing Project to Synthesize Information on Highway Problems
- 281 Aggregate Tests for Portland Cement Concrete Pavements: Review and Recommendations
- 282 Fiber Reinforced Polymer Composites for Concrete Bridge Deck Reinforcement
- 283 Jackknife Testing—An Experimental Approach to Refine Model Calibration and Validation
- 284 Experimental Plan for Calibration of Hot-Mix Asphalt Performance Models with Measured Materials Properties

NCHRP Legal Research Digest²

- 48 Civil Rights in Transportation Projects

NCHRP Web Documents (online)

- 54 Contractor's Interim Report: Precision Estimates of Selected Volumetric Properties of HMA Using Non-Absorptive Aggregate
- 55 Environmental Information Management and Decision Support System Implementation Handbook—Appendixes B through F
- 56 Sensitivity Evaluation of Field Shear Test Using Improved Protocol and Indirect Tension Strength Test
- 57 Development and Evaluation of a National Data-Management System for Highway Tort Claims
- 58 Research for Customer-Driven Benchmarking of Maintenance Activities
- 59 Outsourcing of State DOT Capital Program Delivery Functions
- 60 LTPP Data Analysis: Daily and Seasonal Variations in In Situ Material Properties

NCHRP CD-ROMs

- CRP-CD-20 Selected Studies in Transportation Law: Volume 3: Environmental Law and Transportation
- CRP-CD-26 NCHRP Report 483 Supplementary Material and Software
- CRP-CD-28 NCHRP Report 486 Supplementary Material and RSRAP Software
- CRP-CD-29 NCHRP Report 485 Supplementary Material: Subdomain Data, Common Tables, and Data Viewer; Volumes 1 and 2
- CRP-CD-30 NCHRP Report 489 Supplementary Material: Appendixes
- CRP-CD-32 NCHRP Project 25-6: Intersection Air Quality Model, Contractor's Report
- CRP-CD-33 NCHRP Report 492 Supplementary Material RSAP Program and User's Manual
- CRP-CD-35 NCHRP Report 493 Supplementary Material: Working Papers
- CRP-CD-36 NCHRP Report 488 Supplementary Material: DIL Program and User's Manual
- CRP-CD-37 NCHRP Report 495 Supplementary Material: CARRIS Software Module and User's Guide
- CRP-CD-38 NCHRP Report 504 Supplementary Material: Appendixes

- CRP-CD-41 Software for NCHRP Report 506: Positional Data in Transportation

Transit Cooperative Research Program (TCRP) Reports³

- 71 Transit Switch Design Analysis (Phase I): Volume 2
- 84 e-Transit: Electronic Business Strategies for Public Transportation:
 - Volume 3: Using the Internet for Transit Training and Certification (with CD-ROM)
 - Volume 4: Advanced Features of Transit Websites (with CD-ROM)
- 86 Public Transportation Security:
 - Volume 3: Robotic Devices: A Guide for the Transit Environment
 - Volume 4: Intrusion Detection for Public Transportation Facilities Handbook
- 87 Strategies for Increasing the Effectiveness of Commuter Benefits Programs
- 88 A Guidebook for Developing a Transit Performance-Measurement System
- 89 Financing Capital Investment: A Primer for the Transit Practitioner
- 90 Bus Rapid Transit
 - Volume 1: Case Studies in Bus Rapid Transit (with CD-ROM)
 - Volume 2: Implementation Guidelines
- 91 Economic Benefits of Coordinating Human Service Transportation and Transit Services
- 92 Strategies for Improved Traveler Information
- 93 Combating Global Warming Through Sustainable Surface Transportation Policy
- 94 Fare Policies, Structures and Technologies: Update
- 95 Update Handbook: Traveler Response to Transportation System Changes
 - Chapter 11: Transit Information and Promotion
 - Chapter 14: Road Value Pricing
 - Chapter 15: Land Use and Site Design
 - Chapter 18: Parking Management and Supply
- 96 Determining Training for New Technology: A Decision Game and Facilitation Guide
- 97 Emerging New Paradigms: A Guide to Fundamental Change in Local Public Transportation Organizations
- 98 Resource Requirements for Demand-Responsive Transportation Services
- 100 Transit Capacity and Quality of Service Manual, 2nd Ed. (with CD-ROM)

TCRP Synthesis of Transit Practice³

- 46 Diversity Training Initiatives
- 47 Corporate Culture as the Driver of Transit Leadership Practices
- 48 Real-Time Bus Arrival Information Systems
- 49 Yield to Bus—State of the Practice
- 50 Use of Rear-Facing Position for Common Wheelchairs on Transit Buses

TCRP Research Results Digests³

- 56 A Summary of TCRP Report 88: A Guidebook for Developing a Transit Performance-Measurement System

- 57 Developing a Recommended Standard for Automated Fare Collection for Transit
- 58 International Transit Studies Program; Report on the Spring 2002 Mission: Safety and Security Issues at All-Bus Systems in Small- to Medium-Sized Cities in Western Europe
- 59 A Guide to Public Transportation Security Resources
- 60 Characteristics of State Funding for Public Transportation—2002
- 61 Interim Introduction to the Updated Traveler Response to Transportation System Changes
- 62 International Transit Studies Program; Report on the Fall 2002 Mission: Transit Operations in Central and Eastern Europe
- 63 Synthesis of Information Related to Transit Problems
- 64 International Transit Studies Program; Report on the Spring 2003 Mission: Excellence in Customer Service in Transit Operations in Small- and Medium-Sized Cities in Western Europe

TCRP Legal Research Digest³

- 19 Impact of the Americans with Disabilities Act on Transit Operations

TCRP Web Documents (online)

- 22 Public Agency Guidance on Employer-Based TDM Programs and Employer Technical Memorandum Characteristics of Effective TDM Programs
- 23 Uses of Archived AVL-APC Data to Improve Transit Performance and Management: Review and Potential

TCRP CD-ROMs

- CRP-CD-20 Selected Studies in Transportation Law; Volume 6: Transit Labor 13[c] Decisions
- CRP-CD-25 TCRP Report 88 Supplementary Material: A Guidebook for Developing a Transit Performance Measurement System
- CRP-CD-27 TCRP Report 84 Supplementary Material; Volume 3: Using the Internet for Transit Training and Certification
- CRP-CD-31 TCRP Report 90 Supplementary Material: Bus Rapid Transit Case Studies
- CRP-CD-34 TCRP Report 84 Supplementary Material; Volume 4: Advanced Features of Transit Websites
- CRP-CD-40 Software for TCRP Report 98, Requirements for Demand Responsive Services
- CRP-CD-42 Supplemental Material for the TCQSM

Commercial Truck and Buses Safety Synthesis Program (CTBSSP)³

- SYN 1 Effective Commercial Truck and Bus Safety Management Techniques
- SYN 2 Security Measures in the Commercial Trucking and Bus Industries
- SYN 3 Highway/Heavy Vehicle Interaction
- RRD 2 Commercial Truck and Bus Safety Synthesis Program: A Status Report

Ignition

Nos. 2–5

Future Strategic Highway Research Program (F-SHRP) Web Documents

- 1 Detailed Planning for Research on Accelerating the Renewal of America's Highways; Study 1: Renewal
- 2 Detailed Planning for Research on Making a Significant Improvement in Highway Safety; Study 2: Safety
- 3 Providing a Highway System with Reliable Travel Times; Study 3: Reliability
- 4 Interim Planning Activities for a Future Strategic Highway Research Program; Study 4: Capacity

Cooperative Research Program Miscellaneous Publications

NCHRP 40th Anniversary Brochure

TRB PUBLICATIONS

January 1–December 31, 2003

- 43 Transportation Research Records: Journal of the Transportation Research Board
- 7 Special Reports
- 3 Miscellaneous Publications
- 1 Conference Proceedings
- 13 Transportation Research Circulars (online)
- 6 issues of *TR News*
- 2 issues of *LRT News* (online)
- 1 issue of *Intercity Rail Passenger Systems Update* (online)
- 33 NCHRP Reports
- 18 NCHRP Syntheses
- 13 NCHRP Research Results Digests
- 1 NCHRP Legal Research Digests
- 7 NCHRP Web Documents (online)
- 12 NCHRP CD-ROMs
- 21 TCRP Reports
- 5 TCRP Syntheses
- 8 TCRP Research Results Digests
- 1 TCRP Legal Research Digests
- 2 TCRP Web Documents (online)
- 7 TCRP CD-ROMs
- 3 CTBSSP Syntheses
- 1 CTBSSP Research Results Digest
- 4 F-SHRP Web Documents
- 4 issues of *Ignition*

Weekly issues of *TRB Transportation Research Electronic Newsletter*

NCHRP 40th Anniversary Brochure

¹ Available in print and online.

² Publications released since 2001 are available in print and online.

³ Entire series is available in print and online.

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Federal Highway Administration
Federal Motor Carrier Safety Administration
Federal Railroad Administration
Federal Transit Administration
Maritime Administration
National Highway Traffic Safety Administration
Research and Special Programs Administration

National Aeronautics and Space Administration
U.S. Army Corps of Engineers
U.S. Coast Guard
U.S. Department of Energy
U.S. Environmental Protection Agency

Private-Sector Organizations

American Public Transportation Association
American Transportation Research Institute
Association of American Railroads
National Asphalt Pavement Association

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