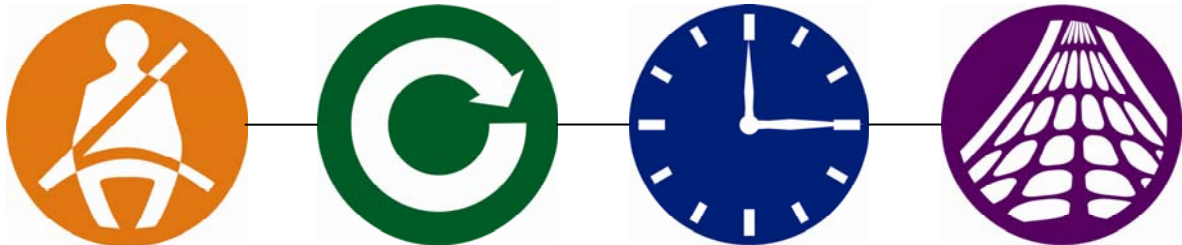


*Accelerating solutions for highway safety, renewal, reliability, and capacity*

# 2006 Annual Report



**Strategic Highway Research Program 2**

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

**J. Edward Johnson**, Director, Applied Science Directorate, National Aeronautics and Space Administration, John C. Stennis Space Center, Mississippi (ex officio)

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**Nicole R. Nason**, Administrator, National Highway Traffic Safety Administration, U.S. Department of Transportation (ex officio)

**Jeffrey N. Shane**, Under Secretary for Policy, U.S. Department of Transportation (ex officio)

**James S. Simpson**, Administrator, Federal Transit Administration, U.S. Department of Transportation (ex officio)

**Carl A. Strock** (Lt. Gen., U.S. Army), Chief of Engineers and Commanding General, U.S. Army Corps of Engineers, Washington, D.C. (ex officio)

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\* Membership as of March 2007.

## **TRB Oversight Committee for the Strategic Highway Research Program 2**

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**Allen D. Biehler**, Secretary of Transportation, Penn DOT

### Members

**H. Norman Abramson**, Executive Vice President (retired) Southwest Research Institute

**Anne P. Canby**, President, Surface Transportation Policy Partnership

**Frank L. Danchetz**, Vice President, ARCADIS G&M, Inc.

**Nicholas J. Garber**, Henry L. Kinnier Professor, University of Virginia

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

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**Paul T. Wells**, retired

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**J. Richard Capka**, Administrator, FHWA

**Nicole Nason**, Administrator, National Highway Traffic Safety Administration

**Andrew T. Horosko**, Deputy Minister of Transportation, Manitoba Transportation and Government Services

**John C. Horsley**, Executive Director, AASHTO

### Liaison

**John Pearson**, Program Director, Council of Deputy Ministers Responsible for Transportation and Highway Safety

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The **National Academy of Sciences** is a private, nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. On the authority of the charter granted to it by the Congress in 1863, the Academy has a mandate that requires it to advise the federal government on scientific and technical matters. Dr. Ralph J. Cicerone is president of the National Academy of Sciences.

The **National Academy of Engineering** was established in 1964, under the charter of the National Academy of Sciences, as a parallel organization of outstanding engineers. It is autonomous in its administration and in the selection of its members, sharing with the National Academy of Sciences the responsibility for advising the federal government. The National Academy of Engineering also sponsors engineering programs aimed at meeting national needs, encourages education and research, and recognizes the superior achievements of engineers. Dr. William A. Wulf is president of the National Academy of Engineering.

The **Institute of Medicine** was established in 1970 by the National Academy of Sciences to secure the services of eminent members of appropriate professions in the examination of policy matters pertaining to the health of the public. The Institute acts under the responsibility given to the National Academy of Sciences by its congressional charter to be an adviser to the federal government and, on its own initiative, to identify issues of medical care, research, and education. Dr. Harvey V. Fineberg is president of the Institute of Medicine.

The **National Research Council** was organized by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the Academy's purposes of furthering knowledge and advising the federal government. Functioning in accordance with general policies determined by the Academy, the Council has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in providing services to the government, the public, and the scientific and engineering communities. The Council is administered jointly by both the Academies and the Institute of Medicine. Dr. Ralph J. Cicerone and Dr. William A. Wulf are chair and vice chair, respectively, of the National Research Council.

The **Transportation Research Board** is a division of the National Research Council, which serves the National Academy of Sciences and the National Academy of Engineering. The Board's mission 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 Board's varied activities annually engage more than 4,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation. [www.TRB.org](http://www.TRB.org)

[www.national-academies.org](http://www.national-academies.org)

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## 2006 Annual Report of SHRP 2 Program Activities

### Introduction

The U.S. Congress authorized the second Strategic Highway Research Program (SHRP 2) in August 2005 to address complex transportation goals that require integrated and innovative approaches to four focus areas: reducing crashes, renewing highway infrastructure, increasing highway capacity, and providing reliable travel times. These focus areas reflect both the role of the highway system in meeting the nation's economic and mobility needs and the aim of transportation departments to provide outstanding service to their customers.

SHRP 2 is being conducted under a Memorandum of Understanding among the American Association of State Highway and Transportation Officials (AASHTO), the Federal Highway Administration (FHWA), and the National Research Council, which is the parent organization of the Transportation Research Board (TRB). Figure 1 shows the participants in the signing ceremony.



In January 2006, J. Richard Capka of the FHWA, John C. Horsley of AASHTO, and Ralph J. Cicerone of the National Academy of Sciences (*left to right*) signed the Memorandum of Understanding that officially established SHRP 2. Witnessing the event are (*standing, left to right:*) Brian McLaughlin, Federal Motor Carrier Safety Administration; Stephen Godwin, TRB; TRB Executive Director Robert E. Skinner, Jr.; Dennis Judycki, FHWA; Anne Canby, Surface Transportation Policy Partnership; Allen Biehler, Pennsylvania DOT; Nicholas Garber, University of Virginia; Ann M. Brach, TRB; C. Michael Walton, University of Texas, Austin; Neil Pedersen,

Maryland State Highway Administration; Rebecca Brewster, American Transportation Research Institute; John Njord, Utah DOT; Neil F. Hawks, TRB; and Henry G. (Gerry) Schwartz, Jr., Washington University in St. Louis.

In late March 2006, first-year funding for SHRP 2 became available through an agreement with FHWA, initiating an ambitious schedule of activities to staff the program, establish committees, refine research plans, and issue the first requests for research proposals. The timeline in Figure 2 outlines the activities of 2006.

**Figure 2  
2006 Program Timeline**

Interviewing for SHRP 2 staff Forming committees and ETGs	<b>January</b> 1 <sup>st</sup> Oversight Committee meeting
	<b>March</b> SHRP 2 Program Funding available
	<b>May &amp; June</b> 4 TCC meetings to revise research plans to match funding
	<b>July</b> Oversight Committee approves revised plans
	<b>August</b> 11 ETG Meetings 12 RFPs written and reviewed
	<b>September</b> 12 RFPs advertised
	<b>October</b> 49 proposals received
	<b>November</b> 11 ETGs review & recommend proposals
	<b>December</b> Oversight Committee approves 15 proposals; contracting begins

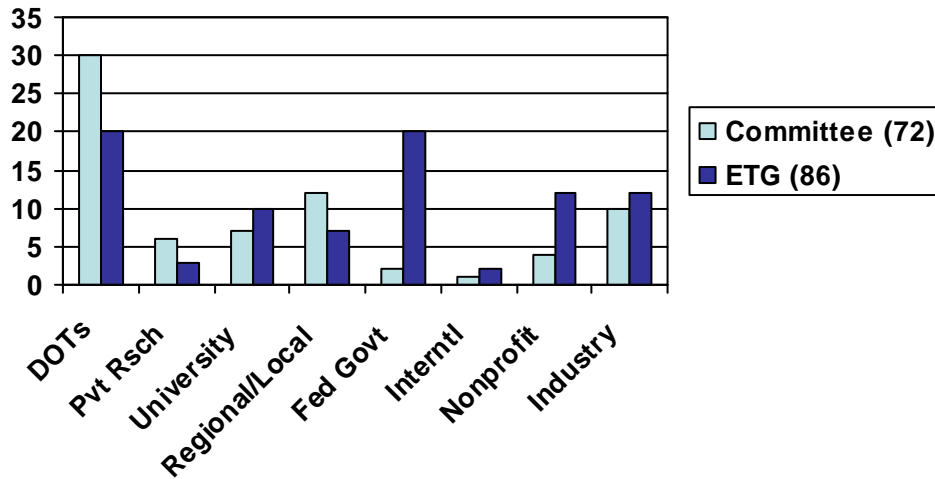
**Program Management and Oversight**



TRB manages SHRP 2 in close cooperation with FHWA and AASHTO. The SHRP 2 Oversight Committee, chaired by Allen D. Biehler, Secretary of

Transportation for Pennsylvania, (*shown above*) has responsibility for all aspects of the program’s research activities. A technical coordinating committee (TCC) in each of the four focus areas is responsible for recommending the research plan and for monitoring the conduct of the research. Small expert task groups (ETGs) are convened as necessary to draft requests for proposals (RFPs), review proposals, and provide additional expertise to the technical coordinating committees and staff. Members of these committees and groups are knowledgeable and experienced professionals in transportation and related fields, recruited from around the nation, and serve without compensation. While these volunteers are selected for their personal expertise, every effort is made to include a range of perspectives in each committee and ETG.

Figure 3 shows the affiliations of committee members and of ETG members who served in 2006.



**Figure 3 Committee and ETG Members by Affiliation**

The Administrators of FHWA and the National Highway Traffic Safety Administration (NHTSA) serve as *ex officio* members of the Oversight Committee. Two FHWA staff serve as liaisons on each TCC; the Safety TCC also includes NHTSA and Federal Motor Carrier Safety Administration liaisons.

The role of SHRP 2 State Coordinator was created as a point of contact for SHRP 2 communication and eventually for implementation activities. Named by 48 state DOTs at the request of AASHTO, the State Coordinators, as such, are not an appointed committee but are a source of nominations for committees and ETGs.

## Research Focus Areas

**Safety**      *TCC Chair: Forrest M. Council, University of North Carolina*



SHRP 2 safety research will take advantage of unprecedented opportunities to improve highway safety through advanced technologies. Most highway safety research has focused on crashes and how changes in vehicles and roads could improve safety. SHRP 2 safety research will focus on collecting data on driver behavior in pre-crash and non-crash circumstances. The research will quantify the interactions of drivers, roads, vehicles, and environmental conditions and develop objective measures of crash risk. An ambitious effort will use on-board recorders to capture data on 2,000 to 3,000 volunteer drivers, their vehicles, the environment, and the



roadways. Analysis of the data will have implications for effective countermeasures to reduce the number and severity of crashes.

By December 2006, contracts for the first three Safety projects were being negotiated. These projects will initiate the design of the major safety studies to follow. For Project S01, five separate contracts were awarded to develop or identify approaches to analyzing driving behavior and crash risk data and to demonstrate the methods on recently collected data sets from in-vehicle studies. Project S05 will develop and demonstrate the in-vehicle data collection system as well as design a management plan for the full-scale study of in-vehicle driving behavior and crash risk. The goal of Project S09 is to develop a site-based video system that captures surrogate measures of collision risk and demonstrates in a field study the correlation of the surrogate measures to actual crash frequencies.

**Renewal** TCC Chair: *Randell H. Iwasaki, California DOT*



The U.S. highway system is aging and must be rebuilt while we are driving on it and living next to it. Research in the renewal focus area therefore addresses the need to complete highway projects quickly, with minimal disruption to the community, and to produce facilities that are long-lasting. Identifying new technologies for locating underground utilities; developing procedures to speed the evaluation of designs and the inspection of construction; and applying new methods and materials for preserving, rehabilitating, and reconstructing roadways and bridges are among the goals for this focus area. Alternative strategies for contracting, financing and managing projects, and mitigating institutional barriers also are part of the emphasis on rapid renewal.

Contractors for the first four Renewal contracts were selected in 2006. These projects aim to develop long-needed products. Project R01, in its first phase, will develop a research plan to identify technologies that accurately locate and characterize underground utilities and facilitate their development. Project R06 will identify technologies for rapid nondestructive testing and inspection and identify tests that need such technologies. The goal of Project R07 is to produce and validate performance specifications that ensure proper facility performance, reduce project completion time; balance the relative risk among owners, contractors, and subcontractors; and encourage innovation. Project R15 will recommend an approach to finding strategies that integrate the priorities of utility companies and transportation agencies in highway renewal projects.

**Reliability** TCC Chair: *John F. Conrad, Washington State DOT*



Improving the reliability of travel times can reduce the costs and frustrations of traffic delays and can help address the problems of roadway congestion. Research in the reliability focus area will identify and analyze congestion mitigation measures and practices at agencies that have improved travel time

reliability; develop analytical procedures for estimating the benefits and effectiveness of countermeasures; assess the institutional architectures necessary for successful operations programs; and develop local and national programs to monitor reliability.

Contractors for two Reliability projects were selected in 2006. Project L03 ultimately will establish statistical relationships between measures taken to improve travel time reliability and actual travel times, so that the effectiveness of strategies to improve reliability can be measured. The goal of Project L06 is to provide guidance on reconfiguring institutional components to support operations activities organically.

**Capacity**    *TCC Co-Chairs: Neil J. Pedersen, Maryland SHA and Mary Lynn Tischer, Commonwealth of Virginia*



The objective of the capacity focus area is to develop a consistent framework for reaching balanced, collaborative decisions on enhancing transportation capacity and to provide the tools for applying the framework. The research will develop a project evaluation process that will help stakeholders balance the need to reduce delays caused by conflicting demands with the need to produce transportation solutions that support community, economic, and environmental goals.

The research also will develop a structure for a project's many contributors to share data and knowledge. This will require identifying critical points for decision making in various processes, the data and knowledge required for these decisions, and successful methods of sharing information. Two Capacity projects were selected in 2006; both address the way decisions about highway capacity are made. Project C01 will frame a system that helps stakeholders collaborate to reach decisions about transportation capacity enhancements. Project C02 will develop performance measures that support this collaborative decision-making process.

Table 1 lists the 2006 research program for each focus area, the research agencies whose contracts had been signed when this document was printed, and the budget for each project.

## Communications



The SHRP 2 Web site and the TRB e-newsletter have been the primary means of relating information about the program and the research plans during this first year. These will remain the basic communications tools, and the Web site will continue to be developed to provide features and resources that support collaboration across the focus areas. Four quarterly updates, presentations from the TRB annual meeting and the August SHRP 2 Safety Symposium, and 4-page program briefs for each focus area were all posted to the Web site this year. The program briefs were also printed for distribution at the TRB annual meeting. Plans are developing for further international and targeted outreach.

**Table 1 Projects and Contractors Selected in 2006**

<b>No.</b>	<b>Project Title</b>	<b>Recommended Contractors</b>	<b>\$ million</b>
S01	Development of Analysis Methods Using Recent Data (multiple awards)	University of Minnesota University of Michigan University of North Carolina Iowa State University (5 <sup>th</sup> award pending contract execution)	\$1.5 (total)
S05	Design of the In-Vehicle Driving Behavior and Crash Risk Study	(pending contract execution)	\$3.0
S09	Site-Based Video System Design and Development	University of Michigan	\$1.0
R01	Encouraging Innovation in Locating and Characterizing Underground Utilities	Louisiana Tech University	\$0.3
R06	High-Speed, Nondestructive Testing Procedures for Both Design Evaluation and Construction Inspection	(pending contract execution)	\$0.35
R07	Performance Specifications for Rapid Highway Renewal	Trauner Consulting Services, Inc.	\$3.0
R15	Strategies for Integrating Utility and Transportation Agency Priorities in Renewal Projects	ICF International	\$0.25
L03	Analytic Procedures for Determining the Effects of Mitigation Measures	Cambridge Systematics, Inc.	\$1.75
L06	Institutional Architectures for Advanced Operations Strategies	PB Consult, Inc.	\$1.0
C01	A Framework for Collaborative Decision Making on Additions to Highway Capacity	ICF International	\$2.6
C02	System-Based Performance Measurement Framework for Highway Capacity Decision Making	Cambridge Systematics, Inc.	\$0.825
	<b>TOTAL</b>		<b>\$15.575</b>

## **Staffing**

The efforts to launch a fully operational SHRP 2 when funding became available in March 2006 were accomplished by a core staff that continues to grow to its full complement. Neil F. Hawks, a program manager in the first SHRP and a division director at TRB, was named SHRP 2 director. Ann M. Brach, study director for F-SHRP and other TRB policy studies and former research director at Maryland State Highway Administration, was appointed deputy director. By December 2006, five senior program officers, a communications officer, an administrative coordinator, and two program assistants were on staff. In addition, Derek Sweet, on loan from the Canadian Council of Deputy Ministers of Transport, joined the staff for a 1-year mission to establish international activities for SHRP 2. The staffing process will continue as projects get under way.

## **SHRP 2 Staff 2006**

Neil F. Hawks, *Director*

Ann M. Brach, *Deputy Director*

Stephen J. Andrle, *Senior Program Officer, Capacity*

James Bryant, *Senior Program Officer, Renewal*

Kenneth Campbell, *Senior Program Officer, Safety*

Jo Ann Coleman, *Senior Project Assistant*

Walter Diewald, *Senior Program Officer, Reliability*

Charles Fay, *Program Officer, Safety*

William A. Hyman, *Senior Program Officer, Reliability*

Makeeya Hazelton, *Senior Project Assistant*

Linda S. Mason, *Communications Officer*

A. Robert Raab, *Senior Program Officer, Renewal*

Monica Starnes, *Senior Program Officer, Renewal*

Noreen Stevenson, *Senior Project Assistant*

Derek Sweet, *International Coordinator*

Chrystyne Talley, *Financial Associate*

Connie Woldu, *Administrative Coordinator*



Explore the SHRP 2 Web site at: [www.TRB.org/SHRP2](http://www.TRB.org/SHRP2)

Contact SHRP 2:

By email: [SHRP2@nas.edu](mailto:SHRP2@nas.edu) By phone: 202-334-1430 By fax: 202-334-3471

By mail: 500 Fifth Street NW, Washington, DC 20001

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